

**DOWNERS GROVE SANITARY DISTRICT  
LIBERTY PARK PUMPING STATION  
REPLACEMENT**

**PROJECT MANUAL**

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PROJECT TITLE PAGE  
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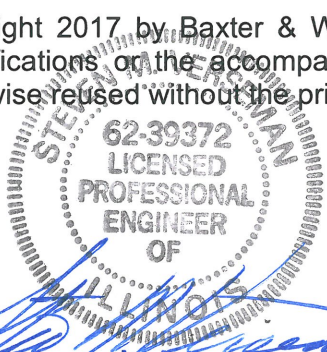


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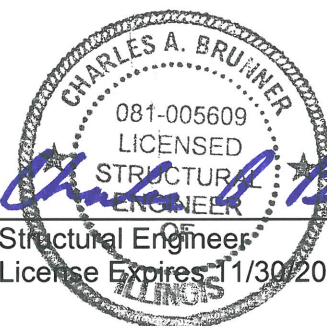
SEALS PAGE

June 13, 2017

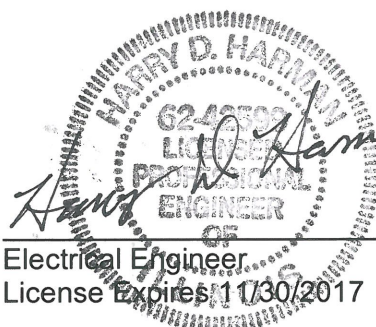
1. Specifications of materials and labor required for the construction work shown on the Drawings are prepared by Baxter & Woodman, Inc., Consulting Engineers.
2. The Drawings which accompany these Specifications are titled "Downers Grove Sanitary District – Liberty Park Pumping Station Replacement".
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**DOWNERS GROVE SANITARY DISTRICT  
LIBERTY PARK PUMPING STATION REPLACEMENT  
PROJECT MANUAL**

**TABLE OF CONTENTS**

<u>Section Number</u>	<u>Section</u>
<u>DIVISION 00</u>	- PROCUREMENT AND CONTRACTING REQUIREMENTS
00 01 01	PROJECT TITLE PAGE
00 01 07	SEALS PAGE
00 01 10	TABLE OF CONTENTS
00 11 13	ADVERTISEMENT FOR BIDS
00 21 00.13	BIDDER INSTRUCTIONS
00 31 32.13	SUBSURFACE DRILLING AND SAMPLING INFORMATION
00 41 00.13	BID FORM
00 43 13	BID SECURITY FORM
00 43 36	PROPOSED SUBCONTRACTORS FORM
00 43 93	BID SUBMITTAL CHECKLIST
00 52 00.13	AGREEMENT
00 60 01	REPRESENTATIONS, CERTIFICATIONS AND FORMS
00 61 13.13	PERFORMANCE BOND FORM
00 61 13.16	PAYMENT BOND FORM
00 61 19	MAINTENANCE BOND FORM
00 62 07	SUBSTANCE ABUSE PREVENTION PROGRAM
00 62 08	EMPLOYMENT OF ILLINOIS WORKERS ON PUBLIC WORKS ACT
00 62 16	CERTIFICATE OF INSURANCE FORM
00 62 16.13	ADDITIONAL INSUREDS
00 62 16.16	ADDITIONAL INSUREDS
00 62 16.19	ADDITIONAL INSUREDS
00 62 16.21	ADDITIONAL INSUREDS
00 62 76.01	SWORN STATEMENT
00 62 76.02	PARTIAL WAIVER OF LIEN
00 62 76.03	CONTRACTOR'S AFFIDAVIT
00 62 76.04	FINAL WAIVER OF LIEN
00 62 76.13	SALES TAX FORM
00 62 78	LIST OF SPARE PARTS
00 63 49	WORK CHANGE DIRECTIVE FORM
00 63 63	CHANGE ORDER FORM
00 65 16	CERTIFICATE OF SUBSTANTIAL COMPLETION FORM
00 65 19	CERTIFICATE OF COMPLETION FORM
00 65 36	WARRANTY FORM
00 72 00	GENERAL CONDITIONS
00 73 00.13	SUPPLEMENTARY CONDITIONS

Table of Contents - continued

<u>Section Number</u>	<u>Section</u>
<u>DIVISION 01</u>	- GENERAL REQUIREMENTS
01 14 11	CONTRACTOR USE OF PREMISES
01 21 13	CASH ALLOWANCE
01 26 13	REQUESTS FOR INTERPRETATION
01 26 13.13	RFI FORM
01 31 19	PROJECT MEETINGS
01 32 16	CONSTRUCTION PROGRESS SCHEDULES
01 33 01	SUBMITTALS
01 41 26	PERMITS
01 42 13	ABBREVIATIONS AND ACRONYMS
01 45 29	TESTING LABORATORY SERVICES
01 50 00	TEMPORARY FACILITIES AND CONTROLS
01 61 01	GENERAL EQUIPMENT REQUIREMENTS
01 66 11	STORAGE AND PROTECTION OF MATERIAL AND EQUIPMENT
01 73 29	CUTTING AND PATCHING
01 74 23	FINAL CLEANING
01 77 01	CONTRACT CLOSEOUT
01 77 15	SEWER TELEVISION FOR FINAL INSPECTION
01 78 26	OPERATION AND MAINTENANCE MANUAL
01 78 39	PROJECT RECORD DOCUMENTS
01 91 58	FACILITY STARTUP
<u>DIVISION 02</u>	- EXISTING CONDITIONS
02 41 53	DEMOLITION, REMOVAL AND ABANDONMENT
<u>DIVISION 03</u>	- CONCRETE
03 30 00	CAST-IN-PLACE CONCRETE
<u>DIVISION 05</u>	- METALS
05 50 00	METAL FABRICATIONS
<u>DIVISION 07</u>	- THERMAL AND MOISTURE PROTECTION
07 92 00	JOINT SEALANTS
<u>DIVISION 08</u>	- OPENINGS
08 31 23	FLOOR ACCESS DOORS AND FRAMES

Table of Contents - continued

<u>Section Number</u>	<u>Section</u>
<u>DIVISION 09</u>	- FINISHES
09 90 00	PAINTING AND COATING
<u>DIVISION 22</u>	- PLUMBING
22 19 13	PIPE AND PIPE FITTINGS
22 19 23	VALVES
22 19 26	GAUGES
<u>DIVISION 26</u>	- ELECTRICAL
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26	GROUNDING AND BONDING OF ELECTRICAL SYSTEMS
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33	RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 09 95	PUSHBUTTONS, SELECTOR SWITCHES, AND PILOT LIGHTS
26 09 96	ELECTRICAL SYSTEMS CONTROL DEVICES
26 22 13	LOW VOLTAGE DISTRIBUTION TRANSFORMERS
26 24 16	PANELBOARDS
26 27 16	ELECTRICAL CABINETS AND ENCLOSURES
26 27 26	WIRING DEVICES
26 28 00.00	LOW-VOLTAGE CIRCUIT PROTECTIVE DEVICES
26 28 16	ENCLOSED SWITCHES AND CIRCUIT BREAKERS
26 29 13.16	REDUCED-VOLTAGE MOTOR CONTROLLERS
26 43.00	SURGE-PROTECTIVE DEVICES
26 51 13	INTERIOR LIGHTING FIXTURES, LAMPS, AND BALLASTS
<u>DIVISION 31</u>	- EARTHWORK
31 23 39	EXCAVATING, BACKFILLING, AND COMPACTING
31 23 79	TRENCHING, BACKFILLING, AND COMPACTING
31 25 00	EROSION AND SEDIMENTATION CONTROLS
<u>DIVISION 32</u>	- EXTERIOR IMPROVEMENTS
32 10 00.19	STREET, DRIVEWAY, AND SIDEWALK REPLACEMENT
32 31 13	CHAIN LINK FENCES AND GATES
32 92 00.19	LAWNS AND GRASSES

Table of Contents - continued

<u>Section Number</u>	<u>Section</u>
<u>DIVISION 33</u>	- UTILITIES
33 05 13	MANHOLES AND STRUCTURES
33 32 32.31	SUBMERSIBLE SEWAGE PUMPING EQUIPMENT
<u>DIVISION 40</u>	- PROCESS INTEGRATION
40 91 19.29	LIQUID PRESSURE PROCESS MEASUREMENT DEVICES
40 91 23.33	FLOW PROCESS MEASUREMENT DEVICES
40 91 23.36	LEVEL PROCESS MEASUREMENT DEVICES

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ADVERTISEMENT FOR BIDS

DOWNERS GROVE SANITARY DISTRICT OF DUPAGE COUNTY, ILLINOIS

1. Time and Place of Opening Bids. Sealed proposals for the construction of the Liberty Park Pumping Station Replacement for the Downers Grove Sanitary District of DuPage County, Illinois will be received at the Administration Center at 2710 Curtiss Street, Downers Grove, Illinois 60515 until 10:00 a.m. on Tuesday, July 11, 2017, and at that time will be publicly opened and lump sum bid read aloud.

2. Description of Work. The proposed construction consists of the replacement of an existing pumping station with a new concrete wet well and valve vault; three submersible pumps and mounting hardware; a new electrical control panel; connection to a sanitary sewer and a force main; valves; a bypass pumping operation for construction; extension of an existing fence; site paving and restoration; and other miscellaneous items of work.

3. Information for Bidders. All pertinent documents may be **examined** at the Downers Grove Sanitary District Office - Administration Center at 2710 Curtiss Street, Downers Grove, Illinois 60515.

Copies of the Bidding Documents may be obtained from QuestCDN Construction Data Network, <http://bit.ly/23V1i2M>, or from the Owner, Downers Grove Sanitary District, at the above physical address upon a non-refundable payment of \$10.00 per set.

Not less than the prevailing rate of wages as determined by the Department of Labor or determined by the court on review shall be paid to all laborers, workmen and mechanics performing work under this contract.

The Downers Grove Sanitary District of DuPage County is exempt from the Illinois State, municipal or county Retailers Occupation Tax, Service Occupation Tax, Use Tax, and Service Use Tax as described in Illinois Compiled Statute Chapter 35. Bid prices shall not include the cost of such taxes.

All Bids must be accompanied by a Bidder's bond, certified check, bank cashier's check or bank draft payable to the Downers Grove Sanitary District for ten percent (10%) of the total amount of the Bid as provided in the Bidder Instructions.

4. Rejection of Bids. The Board of Trustees reserves the right to reject any or all Bids and to waive technicalities. Unless the Bids are rejected for good cause, award of contract shall be made to the lowest responsible and responsive Bidder.

Dated at Downers Grove, Illinois this 21<sup>st</sup> day of June, 2017.

Nicholas J. Menninga, General Manager

END OF ADVERTISEMENT FOR BIDS

ADVERTISEMENT FOR BIDS

00 11 13-1 (120511.40)



00 21 00.13

## BIDDER INSTRUCTIONS

### 1. DEFINED TERMS

1.01 Terms used in these Bidder Instructions which are defined in the "Standard General Conditions of the Construction Contract" (EJCDC No. C-700, 2007 edition) have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a bid to a Bidder. The term "Successful Bidder" means the lowest, qualified, responsible and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement for Bids, Bidder Instructions, the Bid Form, all submittals listed in 00 43 93 Bid Submittal Checklist and the proposed Contract Documents, including all Addenda issued prior to receipt of Bids.

### 2. COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents stated in the Bidder Instructions may be obtained from the Engineer or the Engineer's designated independent distributor.

2.02 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.03 Owner and Engineer in making copies of Bidding Documents available do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

### 3. QUALIFICATIONS OF BIDDERS

3.01 To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five days of Owner's request written evidence, such as evidence of Bidder's qualification to do business in the state where the Project is located, financial data, previous experience, present commitments and other such data as may be called for below (or in the Supplementary Conditions).

### 4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

4.01 It is the responsibility of each Bidder before submitting a Bid to: (a) examine the Contract Documents thoroughly; (b) visit the site to become familiar with local conditions that may affect cost, progress, performance, or furnishing of the Work; (c) consider federal, state and local Laws and Regulations that may affect cost, progress, performance of furnishing of the Work; (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.

4.02 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Facilities, and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 4.02, 4.03 and 4.04 of the General Conditions.

4.03 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies, and obtain any additional information and data which pertain to the physical conditions (surface, subsurface, and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work, and which Bidder deems necessary to determine his Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

4.04 On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.

4.05 The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by the Successful Bidder. Easements for structures or changes in existing structures are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents.

4.06 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception, the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

## 5. INTERPRETATIONS AND ADDENDA

Direct all questions about the meaning or intent of the Contract Documents to Steve Verseman (Telephone 815.444.4435, Fax 815.455.0450, or email [sverseman@baxterwoodman.com](mailto:sverseman@baxterwoodman.com)). Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addendum emailed by the Engineer or the Engineer's designated independent distributor to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than 5 business days prior to the Bid Opening might not be answered. Only questions answered by formal written Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect.

5.01 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.



## 6. BID SECURITY

6.01 Each Bid must be accompanied by Bid security made payable to Owner in an amount and in the form stated in the Advertisement for Bids.

6.02 The Bid securities of all except the two lowest responsive, responsible Bidders will be returned promptly after the Bids have been tabulated and checked. The Bid securities of the two lowest responsive, responsible Bidders will be returned as soon as the contract and bonds of the successful Bidder have been properly executed and approved.

## 7. CONTRACT TIMES

7.01 The number of days within which, or the dates by which, the Work is to be (a) Substantially Completed and (b) also completed and ready for final payment are set forth on the Bid Form.

## 8. LIQUIDATED DAMAGES

8.01 Provisions for liquidated damages, if any, are set forth in the Supplementary Conditions, Article 12.

## 9. SUBSTITUTE OR "OR EQUAL" ITEMS

9.01 The Contract, if awarded, will be based solely on the materials and equipment described in the Drawings and Specifications without consideration of possible substitute or "or equal" items.

## 10. SUBCONTRACTORS, SUPPLIERS, AND OTHERS

10.01 The apparent low Bidder, or any other Bidder so requested, shall submit to the office of Engineer within five (5) days after the receipt of Bids, the following information on 00 43 36 Proposed Subcontractors Form:

A. A list of the names of Bidder's proposed Subcontractors whose portion of the Work exceeds \$10,000, along with a description of the Work to be performed by each.

10.02 Bidder shall be required to perform with his own Work forces at least 30% of the Work, unless written consent to subcontract a greater percentage of the Work is obtained from Owner.

## 11. BID FORM

11.01 Only the Bid Forms attached hereto shall be used. Where required, the Bid price of each item shall be in writing and in figures; in case of conflict, the former shall apply.

11.02 Bidder, when signing the Bid, shall meet the following requirements:

A. The full name, telephone number, facsimile number and business address of each Bidder must be entered on the Bid submitted. The Bid shall be signed in the space provided therefore by written signature of the person or persons properly authorized to sign it. All names must be typed or printed below the signature.

B. A Bid submitted by an individual shall be signed by Bidder or by an authorized agent.

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

D. Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The state of incorporation shall be shown below the signature. Such corporation must be licensed to do business in the state in which the Project is located before a Contract to do the Work embraced in the Bid can be signed. If a foreign corporation, the state under which it is incorporated must be named.

E. Bids which are signed by an attorney-in-fact for individuals, firms, partnerships or joint ventures shall have attached thereto a power-of-attorney evidencing authority to sign the Bid.

11.03 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers and dates of which shall be filled in on the Bid Form.

11.04 It is the responsibility of the Bidder to submit a neat, accurate, and complete Bid.

## 12. BASIS OF BID; EVALUATION OF BIDS

12.01 Lump sum:

A. Bidders shall submit a Bid on a lump sum basis as set forth in the Bid form.

12.02 The Bid price shall include such amounts as the Bidder deems proper for overhead and profit on account of cash allowances, if any, named in the Contract Documents as provided in Paragraph 11.02 of the General Conditions.

## 13. SUBMISSION OF BIDS

13.01 Bids shall be submitted at the time and place indicated in the Advertisement for Bids and shall be sealed in an opaque envelope, marked with the Project title (and if applicable, the designated portion of the Project for which the Bid is submitted), name and address of the Bidder, and accompanied by the Bid Security and other required documents. If the Bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with

the notation "BID ENCLOSED" on the face thereof. Any Bids received after the official Bid closure time will be returned to the Bidder unopened.

#### 14. MODIFICATION AND WITHDRAWAL OF BID

14.01 Bids may be modified or withdrawn by notice to Owner at the place designated for receipt of Bids any time prior to opening of Bids. Such notice shall be in writing and signed by Bidder.

14.02 Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with these Bidder Instructions.

14.03 Bid security shall be in an amount sufficient for the Bid as modified or resubmitted.

14.04 After the Bid opening, no Bid may be modified, withdrawn or canceled by Bidder without consent of Owner.

#### 15. OPENING OF BIDS

15.01 Bids will be publicly opened and read aloud. An abstract of the amounts of the base Bids and major alternates (if any) will be made available by Owner to Bidders after opening of Bids.

#### 16. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

16.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

#### 17. AWARD OF CONTRACT

17.01 Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in Owner's best interest to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent criteria established by Owner.

17.02 In evaluating Bids, Owner shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, supplemental prices, and other data as may be requested in the Bid Form or prior to the Notice of Award.

17.03 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of the Bidders, proposed Subcontractors, Suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

17.04 Owner shall have the right to accept alternates in any order or combination, unless specifically otherwise provided.

17.05 A Bid which has not been prepared according to the instructions contained herein or which does not contain a unit price which is both adequate and reasonable for each and every item named in the Bid may be considered irregular and subject to rejection. Unbalanced Bids which cannot be resolved by mathematical correction without resorting to information not contained in the Bid, are subject to rejection.

17.06 If the Contract is to be awarded, it will be awarded to the lowest responsive, responsible Bidder.

17.07 If the Contract is awarded, Owner will give Successful Bidder notification in writing at the earliest possible date.

## 18. CONTRACT SECURITY AND INSURANCE

18.01 Article 5 of the General Conditions and the Supplementary Conditions set forth Owner's requirements as to Performance, Payment and other bonds, and insurance requirements. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by the required Performance Bond, Payment Bond, and Certificate of Insurance.

## 19. SIGNING OF AGREEMENT

19.01 When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the appropriate number of unsigned counterparts of the Agreement with all other Contract Documents attached. Within fifteen (15) days after the date of the Notice of Award, the Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner or Engineer, as so directed, with the required bonds and insurance certificate(s). Within fifteen (15) days thereafter, Owner will deliver fully signed counterparts to Engineer for further distribution to Contractor.

19.02 Failure on the part of the Successful Bidder to execute the Agreement and provide acceptable bonds and insurance certificate(s) within fifteen (15) days after the date the contract was mailed or otherwise delivered to him, will be just cause for the annulment of the award and the forfeiture of the Bid security to Owner, not as a penalty but in payment of liquidated damages sustained as a result of such failure. If Owner fails to execute the Agreement within a reasonable time, not to exceed ninety (90) days after receiving the executed Agreement and acceptable bonds from the Successful Bidder, the Successful Bidder shall have the right to withdraw his proposal without forfeiture of his Bid security.

20. SALES AND USE TAXES

20.01 Owner is exempt from Illinois State sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid.

21. WAGE RATE REQUIREMENTS

21.01 This Project is subject to the Prevailing Wage Act, 820 ILCS 130/.01 et seq., except where a prevailing wage violates a federal law, order, or ruling, the rate conforming to the federal law, order, or ruling shall govern. All Bidders rendering service related to this bid must comply with the Act.

21.02 No less than the prevailing rate of wages as determined by the Department of Labor or determined by the court on review shall be paid to all laborers, workmen and mechanics performing work under this contract. Contractor and all Subcontractors engaged in any part of the Project will be required to comply with the prevailing wage rate requirements and the cost of doing so must be included in the Bid as no extra payment on account of this provision of law will be allowed. The Department of Labor publishes the prevailing wage rates on its website.

21.03 If the Department of Labor revises prevailing wage rates, the revised prevailing wage rates on the Department of Labor's website shall apply to this contract and the Contractor will not be allowed additional compensation on account of said revisions. The Contractor shall review the wage rates applicable to the work of the contract at regular intervals to ensure timely payment of current wage rates. The Contractor agrees no additional notice is required. The Contractor shall be responsible to notify each subcontractor of the wage rates set forth in this contract and any revisions thereto.

21.04 Provide certified payrolls to the Owner each month to demonstrate compliance.

22. STEEL PRODUCTS PROCUREMENT

22.01 Comply with the provisions of the Illinois Steel Products Procurement Act (30 ILCS 565/).

23. SUBSTANCE ABUSE PREVENTION PROGRAM

23.01 Illinois P. A. 095-0635, Substance Abuse Prevention on Public Works Projects Act requires that all Contractors and Subcontractors have a written Substance Abuse Prevention Program, or collective bargaining agreement, in effect that includes a Substance Abuse Prevention Program. Submit a copy of the Substance Abuse Prevention Program or collective bargaining agreement with the governing body, along with a cover letter certifying that their program meets the requirements of the Act, or, as an alternative, use Certificate 00 62 07 from these Specifications. This requirement applies to Contractors and Subcontractors.

23.02 Provide all necessary documentation at the time of the preconstruction meeting.

## 24. EMPLOYMENT OF ILLINOIS WORKERS

24.01 Comply with the provisions of the Employment of Illinois Workers on Public Works Act (30 ILCS 570/) as they may apply to this project.

24.02 Provide signed certification of compliance (Certificate 00 62 08) with the bid.

## 25. UNCONTAMINATED SOIL CERTIFICATION AND DISPOSAL

25.01 Comply with the requirements of Sections 22.51(f)(2)(B) and 22.51a(d)(2)(B) of the Illinois Environmental Protection Act ([415 ILCS5/22.51(f)26(B)] and [415 ILCS5/22.51a(d)(2)(B)]) for the disposal of uncontaminated soils including uncontaminated soil mixed with other clean construction or demolition debris (CCDD) materials. Provide soil testing and professional engineering services needed to certify the uncontaminated soils (LPC-663) unless the Bidding Documents state that the Owner will provide the uncontaminated soil certification.

25.02 Soils which cannot be certified as uncontaminated or soils that are found to be contaminated during the course of the Work shall be tested and disposed as required for Contaminated Waste Disposal.

## 26. ETHICS CERTIFICATION

26.01 Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract.

A. For the purposes of this Paragraph:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
2. "fraudulent practice" means an intentional misrepresentation of facts made:
  - a. to influence the bidding process or the execution of the Contract to the detriment to the Owner,
  - b. to establish Bid or Contract prices at artificial non-competitive levels, or
  - c. to deprive Owner of the benefits of free and open competition;
3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

26.02 Contractor Disclosure of Campaign Contributions

A. A person responsible for preparing a contract for the procurement of goods or services, or change order thereto, for consideration by a governmental entity shall, prior to approval, obtain from the contractor, union, or other vendor, a written disclosure of all contributions made by such entity within the current and previous calendar year to any incumbent officer who will, in any way, participate in, or whose office will benefit, from the award of such contract or change

order. Such disclosure shall be updated annually during the term of a multi-year contract on the anniversary of the contract's award.

B. The requirements of this Section apply to all procurements, including change orders and renewals, in excess of the threshold amount including those in which the governmental entity employed a procurement process other than competitive bidding to award the contract for such goods or services.

For the purposes of this Section, "threshold amount" means an amount at or in excess of \$5,000 less than an amount set by the statute applicable to the governmental entity that would otherwise require procurement through a competitive bidding process. In the event that no statute imposes a competitive bidding requirement upon the governmental entity, the threshold amount shall be \$5,000 less than the amount set forth in Section 5-1022(a) of the Counties Code at the time of the procurement.

END OF BIDDER INSTRUCTIONS





00 31 32.13

## SUBSURFACE DRILLING AND SAMPLING INFORMATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This Section describes soils investigation at the site, and use of data resulting from that investigation.

#### 1.2 SOILS INVESTIGATION REPORT

- A. General:
  - 1. A soils investigation report has been prepared for the site of this Work by Soil and Materials Consultants, Inc.
  - 2. Attached is a copy of the boring log for the one (1) soil boring drilled at the location indicated on the Drawings.
  - 3. Copies of the soils investigation report can be obtained from the Engineers, Baxter & Woodman, Inc., upon request.
- B. Use of data:
  - 1. The soil investigation report was obtained only for the Engineer's use in design and is not a part of the Contract Documents.
  - 2. The geotechnical data is included for Bidders' information and represents only the subsurface conditions at the exact location of each boring, but is not a warranty of subsurface conditions. Interpretation of geotechnical data is the responsibility of the Bidders.
  - 3. Bidders should visit the site and acquaint themselves with existing conditions.
  - 4. Prior to bidding, Bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions, but such investigations may be performed only under time schedules and arrangements approved in advance by the Engineer.
  - 5. The technical data in the above report, upon which the Contractor may rely, consists of boring methods, level of subsurface water, boring logs, laboratory test methods and results, and boring locations all as of the date made.
    - a. Engineer accepts no responsibility for accuracy of the soil data or water level information. Soil information, included with these Contract Documents, was not obtained for the purposes of designing excavations and trenches. Soil information was used by Engineer for design purposes only. Contractor shall assure itself by personal examination as to subsurface conditions and shall provide its own investigations and make its own assumptions to comply with OSHA and any other applicable laws and regulations regarding excavation and trenching requirements.

END OF SUBSURFACE DRILLING AND SAMPLING INFORMATION

SUBSURFACE DRILLING AND SAMPLING INFORMATION

00 31 32.13-1 (120511.40)



Client: Baxter & Woodman, Inc.

File No. 23186 Date Drilled: 3/17/17

Reference: Liberty Park Lift Station  
Downers Grove Township, IL

**Comments:**

Equipment:  CME 45B  CME 55  Hand Auger  Other

**CLASSIFICATION**

Elevation 98.4' Existing Surface

(a) see page 2 of 2

Brown-gray-black clay, some silt, trace sand & gravel, damp, very tough - Fill

5 Dark brown-gray to brown-gray clay, some silt, trace sand & gravel, very damp, tough

10 Gray clay, some silt, trace sand & gravel, damp, very tough to hard

15 Gray clay, some silt, trace sand & gravel, damp, very tough

30 Gray fine sand, trace medium-coarse sand & gravel, very damp, medium dense

35

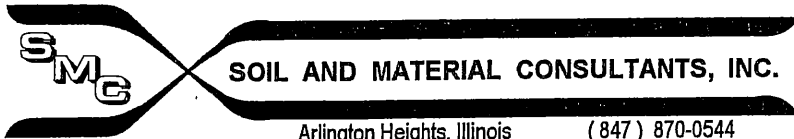
(b) see page 2 of 2

(c) see page 2 of 2

40

depth, ft.	standard penetration	moisture content	dry unit weight lbs./cu.ft.	unconfined compressive strength	
	X	Δ	γ	○	○ unconfined compressive strength, tons/sq.ft. ● penetrometer reading, tons/sq.ft. 1.0 2.0 3.0 4.0 X standard penetration "N", blows/ft. Δ moisture content, % 10 20 30 40
	8	20.1	106.4	2.7	X ● ○ Δ
5	5	31.9	87.8	1.2	X ● ○ Δ
	4	30.7	91.2	1.2	X ● ○ Δ
10	11	21.3	106.8	2.4	X ● ○ Δ
	6	20.8	1107.4	2.0	X ● ○ Δ
15	18	17.8	115.1	4.9	X ● ○ Δ 4.9
	17	17.1	115.0	5.3	X ● ○ Δ 5.3
20	14	19.3	115.2	1.9	X ● ○ Δ
	10	17.3	119.4	1.4	X ● ○ Δ
25	19	14.8	120.3	4.0	X ● ○ Δ
	13	13.7	121.2	2.5	X ● ○ Δ
30	14	15.0			X ● ○ Δ
	14	15.0			X ● ○ Δ
35					
	29	14.1	130.5	3.3	X ● ○ Δ
40		13.5			X ● ○ Δ

Water encountered at 6.0 feet during drilling operations (W.D.).  
Water recorded at 23.0 feet on completion of drilling operations (A.D.).  
Water recorded at \_\_\_\_\_ feet \_\_\_\_\_ hours after completion of drilling operations (A.D.).



Arlington Heights, Illinois (847) 870-0544

# SOIL BORING LOG 1

Logged By: DA

Page: 2 of 2

Client: Baxter & Woodman, Inc.

File No. 23186

Date Drilled: 3/17/17

Reference: Liberty Park Lift Station  
Downers Grove Township, IL

Comments:

Equipment:  CME 45B  CME 55  Hand Auger  Other

**CLASSIFICATION**

Elevation Existing Surface

depth, ft.	Gray clay, some silt, trace sand & gravel, damp, very tough
45-	
	Brown clay & silt, trace sand & gravel, damp, very tough
50-	End of Boring
	(a) Black silt, some clay, trace sand & roots, very damp (topsoil) - Fill
55-	(b) Gray fine-medium sand & gravel, some coarse sand, very damp-saturated, dense
	(c) Gray clay, some silt, trace sand & gravel, damp, very tough
60-	
65-	
70-	
75-	
80-	

standard penetration	moisture content	dry unit weight lbs./cu.ft.	unconfined compressive strength	○ unconfined compressive strength, tons/sq.ft. ● penetrometer reading, tons/sq.ft. 1.0 2.0 3.0 4.0 X standard penetration "N", blows/ft. Δ moisture content, % 10 20 30 40			
X	Δ	γ	○				
15	16.4	116.4	2.8		X	○	
13	13.1	135.4	2.2		X	○	

Water encountered at 6.0 feet during drilling operations (W.D.).  
 Water recorded at 23.0 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 of 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

Term	Qu -tons/sq. ft.	N (unreliable)
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

Term	N - blows/foot
Very Loose	0 - 4
Loose	5 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	50 +

### IDENTIFICATION AND TERMINOLOGY

Term	Size Range
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 0.002 mm

Modifying Term	Percent by Weight
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

#### Moisture Condition

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. with 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 reading, tons/ sq. ft.
W	- Water Content, % of 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]



00 41 00.13

BID FORM

ONE ORIGINAL BID SHALL BE SUBMITTED

To: President and Board of Trustees  
Downers Grove Sanitary District  
2710 Curtiss Street  
Downers Grove, Illinois 60515  
(hereinafter called Owner)

From: \_\_\_\_\_  
Company

\_\_\_\_\_  
Address

City State Zip Code

( ) \_\_\_\_\_  
Telephone

( ) \_\_\_\_\_  
FAX

\_\_\_\_\_  
E-MAIL

(hereinafter called Bidder)

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to furnish all labor, materials, tools, and services required for the construction of the Liberty Park Pumping Station Replacement for the Downers Grove Sanitary District of DuPage County, Illinois (Engineers' Job No. 120511.40), all in accordance with the Bidding Documents prepared by Baxter & Woodman, Inc., Consulting Engineers.
2. Bidder accepts all of the terms and conditions of the Advertisement for Bids and Bidder Instructions, including without limitation those dealing with the disposition of Bid Security. This Bid will remain open for 60 days after the date of Bid opening or for such longer period of time that Bidder may agree to in writing upon request of Owner. Bidder will sign and submit the Agreement with the Bonds and other documents required by the Bidding Documents within 15 days after the date of Owner's Notice of Award.
3. In submitting this Bid, Bidder represents, as set forth in the Agreement, that:
  - a. Bidder has examined copies of all the Bidding Documents.
  - b. Bidder is familiar with the nature and extent of the Bidding Documents, Work, site, locality, and all local conditions and legal and regulatory requirements that in any

manner may affect cost, progress, performance, or furnishing of the Work, and has made such independent investigations as Bidder deems necessary.

- c. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.
- d. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
- e. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- f. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
- g. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- h. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the Work for which this Bid is submitted.
- i. This Bid is genuine and not made in the interest or on behalf of any undisclosed person, firm or corporation, and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm, or a corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.
- j. By submission of the Bid, Bidder certifies, and in the case of a Joint Bid each party thereto certifies as to his own organization, that in connection with the Bid:
  - (1) The prices in the 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) Unless otherwise required by law, the prices which have been quoted in the Bid have not knowingly been disclosed by the Bidder, prior to opening, directly, or indirectly to any other Bidder or to any competitor.
- (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.
- (4) Bidder is not barred from contracting with the Owner as a result of a violation 720 ILCS 5/33 et seq.

- k. Bidder agrees that no less than the prevailing rate of wages as determined by the Department of Labor or determined by the court on review, shall be paid to all laborers, workmen, and mechanics performing work under this contract.
- l. Bidder complies with the provisions of the Employment of Illinois Workers on Public Works Act (30 ILCS 570/) as they may apply to this Project.
- m. Bidder will comply with the requirements of Sections 22.51(f)(2)(B) and 22.51a(d)(2)(B) of the Illinois Environmental Protection Act ([415 ILCS5/22.51(f)(2)(B)] and [415 ILCS5/22.51a(d)(2)(B)]) for the disposal of uncontaminated soils including uncontaminated soil mixed with other clean construction or demolition debris (CCDD) materials and has included any costs associated with compliance in the Bid.

4. Bidder will complete the Work for the following Lump Sum Price:

\_\_\_\_\_

and /100 Dollars (\$ \_\_\_\_\_)

The Bidder has established the above Lump Sum Price to include a **\$5,000.00** Cash Allowance for use by the Owner at the Owner's discretion.

- 5. Bidder agrees that the Work will begin as set forth in the Notice to Proceed and will be Substantially Completed within 240 calendar days after the Contract Time commences to run, and completed and ready for final payment in accordance with Paragraph 1.11 of the Supplementary Conditions within 270 calendar days after the Contract Time has begun.
  - a. Bidder accepts the provisions of the Supplementary Conditions as to liquidated damages in the event of failure to complete the Work on time.

6. Bidder submits the required Bid Security in the form of (Certified Check or Bid Bond) in the amount of \_\_\_\_\_ or \_\_\_\_\_ Percent of the Bid Amount.

7. Bidder will be obtaining Performance and Payment Bonds through the following local agent or broker:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_ email: \_\_\_\_\_

- 8. Bidder submits all items listed in Section 00 43 93 – Bid Submittal Checklist.
- 9. Terms used in this Bid which are defined in the Standard General Conditions of the Construction Contract included as part of the Bidding Documents have the meanings assigned to them in the General Conditions.
- 10. Bidder acknowledges receipt of the following Addenda:

<u>Addendum Number</u>	<u>Date Received</u>
_____	_____
_____	_____
_____	_____
_____	_____

- 11. The person signing this Bid certifies that: (Check applicable box.)
  - ( ) He/She is the person in the Bidder's organization responsible within that organization for the decision as to the prices being bid and that he/she has not participated, and will not participate, in any action contrary to that above; or
  - ( ) He/She is not the person in the Bidder's organization responsible within that organization for the decision as to the prices being bid but that he/she has been authorized 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 the above, and as their agent shall so certify; and shall also certify that he/she has not participated, and will not participate, in any action contrary to that above.

Respectfully submitted, signed, and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

(SEAL) \_\_\_\_\_  
 Bidder

By \_\_\_\_\_  
 \_\_\_\_\_  
 Name - Title

ATTEST:

\_\_\_\_\_

\_\_\_\_\_

Name – Title

END OF BID FORM

00 43 13  
BID SECURITY FORM  
(SAMPLE FORM)

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, \_\_\_\_\_  
\_\_\_\_\_ as Principal, and  
\_\_\_\_\_ as Surety, are hereby  
held and firmly bound unto \_\_\_\_\_ as  
Owner in the penal sum of \_\_\_\_\_ for  
the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves,  
successors and assigns.

Signed, this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

The Condition of the above obligation is such that whereas the Principal has submitted to  
\_\_\_\_\_ a certain BID,  
attached hereto and hereby made a part hereof to enter into a contract in writing, for the  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the Owner may accept such bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

\_\_\_\_\_  
Principal (L.S.)

\_\_\_\_\_  
Surety

By: \_\_\_\_\_

IMPORTANT-Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

00 43 36

PROPOSED SUBCONTRACTORS FORM

TO: President and Board of Trustees  
Downers Grove Sanitary District  
2710 Curtiss Street  
Downers Grove, Illinois 60515  
(hereinafter called Owner)

1. Pursuant to bidding requirements for the Work titled:

DOWNERS GROVE SANITARY DISTRICT  
LIBERTY PARK PUMPING STATION REPLACEMENT

for portions of the Work equaling or exceeding \$10,000, Bidder proposes to use the following Subcontractors. Except as otherwise approved by Owner, Bidder proposes to perform all other portions of the Work with his own forces:

2. Portion of the Work: Subcontractor name and address:

_____	_____
	_____
	_____
_____	_____
	_____
	_____
_____	_____
	_____
	_____
_____	_____
	_____
	_____
_____	_____
	_____
	_____



00 43 93

BID SUBMITTAL CHECKLIST

BIDDER submits the following documents with this Bid:

- a. Form 00 41 00.13 "BID FORM".
- b. Required Bid Security (Certified Check or Bid Bond).
- c. CERTIFICATE 00 62 07 SUBSTANCE ABUSE PREVENTION PROGRAM.
- d. CERTIFICATE 00 62 08 EMPLOYMENT OF ILLINOIS WORKERS ON PUBLIC WORKS ACT.

END OF BID SUBMITTAL CHECKLIST





AGREEMENT

THIS AGREEMENT is dated as of the \_\_\_\_ day of \_\_\_\_\_ in the year 20\_\_ by and between \_\_\_\_\_ (hereinafter called OWNER) and \_\_\_\_\_ (hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, for and in consideration of the mutual promises and covenants contained herein, the sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

ARTICLE 1. WORK

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

\_\_\_\_\_  
\_\_\_\_\_

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

\_\_\_\_\_  
\_\_\_\_\_

ARTICLE 2. ENGINEER

2.01 The Project has been designed by Baxter & Woodman, Inc., Consulting Engineers, hereinafter called ENGINEER, who shall act as OWNER's representative and assume the duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. CONTRACT TIME

STRIKE OUT INAPPLICABLE PARAGRAPH

3.01 The Work will be substantially completed on or before \_\_\_\_\_, 20\_\_, and completed and ready for final payment in accordance with paragraph 1.11 of the Supplementary Conditions on or before \_\_\_\_\_, 20\_\_.

or

3.01 The Work will be substantially completed within \_\_\_\_\_ days after the date when the Contract Times commence to run as provided in paragraph 2.03 of the General Conditions, and

completed and ready for final payment in accordance with paragraph 1.11 of the Supplementary Conditions within \_\_\_\_\_ days after the date when the Contract Times commence to run.

3.02 Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in paragraph 3.01 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. 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 \_\_\_\_\_ Dollars (\$\_\_\_\_\_) for each day that expires after the time or date specified in paragraph 3.01 for Substantial Completion until the Work is substantially complete. After Substantial Completion if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Times or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER \_\_\_\_\_ Dollars (\$\_\_\_\_\_) for each day that expires after the time or date specified in paragraph 3.01 for completion and readiness for final payment.

#### ARTICLE 4. CONTRACT PRICE

4.01 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the conditions and prices stated in CONTRACTOR's Bid pursuant to the provisions of the Contract Documents.

#### ARTICLE 5. PAYMENT PROCEDURES

5.01 CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General and Supplementary Conditions.

#### ARTICLE 6. CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

6.01 CONTRACTOR has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

6.02 CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions, if any, and drawings of physical conditions which are identified in Section 00 31 32.13, Subsurface Drilling and Sampling Information as provided in Article 4 of the General Conditions, and accepts the determination set forth in Section 00 31 32.13, Subsurface Drilling and Sampling Information of the extent of the technical data contained in such reports and drawings, if any, upon which CONTRACTOR is entitled to rely.

6.03 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and

studies (in addition to or to supplement those referred to in paragraph 6.02 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.03 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.

6.04 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examination, investigations, explorations, tests, reports, studies or similar information or data in respect of said underground facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.04 of the General Conditions.

6.05 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

6.06 CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he/she has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

## ARTICLE 7. CONTRACT DOCUMENTS

7.01 The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of this Agreement, the General Conditions, Supplementary Conditions, Specifications and Drawings, all Addenda issued prior to receipt of Bids, CONTRACTOR's Bid, Performance and Payment Bonds, Insurance Certificates, and all written Amendments issued after the Effective Date of the Agreement pursuant to paragraphs 3.04 of the General Conditions.

7.02 There are no Contract Documents other than those listed above in this Article 7. The Contract Documents may only be amended, modified or supplemented as provided in paragraphs 3.04 of the General Conditions.

## ARTICLE 8. MISCELLANEOUS

8.01 Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

8.02 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitations, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written

consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

8.03 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

## ARTICLE 9. OTHER PROVISIONS

9.01 CONTRACTOR certifies that it is not barred from bidding the Work or executing this Agreement as a result of conviction for violation of 720 ILCS 5/33 et seq. prohibiting bid rigging or bid rotating.

9.02 CONTRACTOR certifies that it complies with the provisions of the Employment of Illinois Workers on Public Works Act (30 ILCS 570/) as they may apply to this Project.

9.03 CONTRACTOR certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract.

For the purposes of this Paragraph:

- (1) "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
- (2) "fraudulent practice" means an intentional misrepresentation of facts made:
  - (a) To influence the bidding process or the execution of the Contract to the detriment of Owner,
  - (b) To establish Bid or Contract prices at artificial non-competitive levels, or
  - (c) To deprive Owner of the benefits of free and open competition;
- (3) "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
- (4) "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement as of the day and year first above written.

OWNER:

(SEAL)

\_\_\_\_\_

By:

\_\_\_\_\_

ATTEST:

\_\_\_\_\_

Name - Title

\_\_\_\_\_

\_\_\_\_\_

Name - Title

CONTRACTOR:

(SEAL)

\_\_\_\_\_

By:

\_\_\_\_\_

ATTEST:

\_\_\_\_\_

Name - Title

\_\_\_\_\_

\_\_\_\_\_

Name - Title

END OF AGREEMENT



00 60 01

REPRESENTATIONS, CERTIFICATIONS AND FORMS

00 61 13.13	PERFORMANCE BOND FORM
00 61 13.16	PAYMENT BOND FORM
00 61 19	MAINTENANCE BOND FORM
CERTIFICATE 00 62 07	SUBSTANCE ABUSE PREVENTION PROGRAM
CERTIFICATE 00 62 08	EMPLOYMENT OF ILLINOIS WORKERS ON PUBLIC WORKS ACT
CERTIFICATE 00 62 16	CERTIFICATE OF INSURANCE FORM
CERTIFICATE 00 62 16.13	ADDITIONAL INSUREDS
CERTIFICATE 00 62 16.16	ADDITIONAL INSUREDS
CERTIFICATE 00 62 16.19	ADDITIONAL INSUREDS
CERTIFICATE 00 62 16.21	ADDITIONAL INSUREDS
CERTIFICATE 00 62 76.01	SWORN STATEMENT
FORM 00 62 76.02	PARTIAL WAIVER OF LIEN
FORM 00 62 76.03	CONTRACTOR'S AFFIDAVIT
FORM 00 62 76.04	FINAL WAIVER OF LIEN
00 62 76.13	SALES TAX FORM
00 63 49	WORK CHANGE DIRECTIVE FORM
00 63 63	CHANGE ORDER FORM
CERTIFICATE 00 65 16	CERTIFICATE OF SUBSTANTIAL COMPLETION FORM
CERTIFICATE 00 65 19	CERTIFICATE OF COMPLETION FORM
00 65 36	WARRANTY FORM

REPRESENTATIONS, CERTIFICATIONS AND FORMS

00 60 01 (120511.40)





00 61 13.13

**PERFORMANCE BOND FORM**

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

---

**CONTRACTOR:**

**SURETY:**

**OWNER:**

**CONSTRUCTION CONTRACT:**

Date:

Amount:

Description:

**BOND:**

Date:

Amount:

**CONTRACTOR AS PRINCIPAL:**

Company: \_\_\_\_\_ (Corp. Seal)

**SURETY:**

Company: \_\_\_\_\_ (Corp. Seal)

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

**PERFORMANCE BOND FORM**

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.
3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:
  - 3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below, that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default: and
  - 3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1: and
  - 3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.
4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
  - 4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract: or
  - 4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or
  - 4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default: or
  - 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner: or
    2. Deny liability in whole or in part and notify the Owner citing reasons therefor.
5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:
  - 6.1. The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract"
  - 6.2. Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions of failure to act of the Surety under Paragraph 4; and
  - 6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.
8. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.
9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
12. Definitions.
  - 12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
  - 12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
  - 12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.
  - 12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY --- NAME, ADDRESS AND TELEPHONE) AGENT OR BROKER:	OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

00 61 13.16

**PAYMENT BOND FORM**

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

---

**CONTRACTOR:**

**SURETY:**

**OWNER:**

**CONSTRUCTION CONTRACT:**

Date:

Amount:

Description:

**BOND:**

Date:

Amount:

**CONTRACTOR AS PRINCIPAL:**

Company: \_\_\_\_\_ (Corp. Seal)

**SURETY:**

Company: \_\_\_\_\_ (Corp. Seal)

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

# PAYMENT BOND FORM

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.
2. With respect to the Owner, this obligation shall be null and void if the Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnifies and holds harmless the Owner from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with the Contractor:
    1. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed: and
    2. Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly: and
    3. Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.
5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.
6. RESERVED
7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the

- Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this bond, subject to the Owner's priority to use the funds for the completion of the work.
9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond.
  10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.
  11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2 (iii), or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
  12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
  13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed incorporated herein. The intent is, that this Bond shall be construed as a statutory bond and not as a common law bond.
  14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.
  15. DEFINITIONS
    - 15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitations in the terms, "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.
    - 15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
    - 15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete with the other terms thereof.

FOR INFORMATION ONLY --- NAME, ADDRESS AND TELEPHONE) AGENT OR BROKER:	OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

00 61 19  
MAINTENANCE BOND FORM  
(SAMPLE FORM)

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**MAINTENANCE/WARRANTY BOND**

Know ALL MEN BY THESE PRESENTS. That we \_\_\_\_\_  
as Principal, and \_\_\_\_\_, as  
Surety, are held and firmly bound unto \_\_\_\_\_, State of Illinois  
as Oblige, in the penal sum of \_\_\_\_\_  
(\$\_\_\_\_\_) to which payment well and truly to be made we do bind ourselves, our  
and each of our heirs, executors, administrators, successors, and assigns jointly and severally,  
firmly by these presents.

WHEREAS, the said Principal entered into a Contract with the  
\_\_\_\_\_, State of Illinois \_\_\_\_\_  
dated \_\_\_\_\_ for \_\_\_\_\_

WHEREAS, said Contract provides that the Principal will furnish a Bond conditioned to  
guarantee for the period of \_\_\_\_\_ year(s) after approval of the final payment on  
said job, by the Owner, against all defects in workmanship and materials which may become  
apparent during said period, and

WHEREAS, the said Contract has been completed, and was approved on the  
\_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_\_.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH that, if the  
Principal shall indemnify the Oblige for all loss that the Oblige may sustain by reason of any  
defective materials or workmanship which becomes apparent during the period of  
\_\_\_\_\_ year(s) from and after \_\_\_\_\_ then  
this obligation shall be void, otherwise to remain in full force and effect.

SIGNED, SEALED, AND DATED

\_\_\_\_\_  
(L.S.)

\_\_\_\_\_  
(L.S.)

\_\_\_\_\_  
(L.S.)

Principal(s)

*Surety Name*

by \_\_\_\_\_  
, Attorney-in-Fact



CERTIFICATE 00 62 07

SUBSTANCE ABUSE PREVENTION PROGRAM

The undersigned, upon being first duly sworn, hereby certifies to the (Owner) \_\_\_\_\_, that \_\_\_\_\_(Contractor) has in place a written Substance Abuse Prevention Program that meets or exceeds the requirements of the State of Illinois P.A. 095-0635, or has a collective bargaining agreement in effect dealing with the subject matter of P.A. 095-0635. The Contractor and Subcontractors will file a copy of the Substance Abuse Prevention Program, or collective bargaining agreement, with the Client prior to any work being conducted on the project.

By: \_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Title)

Subscribed and sworn to before me  
this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

My Commission Expires:

\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
SEAL





CERTIFICATE 00 62 08

EMPLOYMENT OF ILLINOIS WORKERS ON PUBLIC WORKS ACT

\_\_\_\_\_, being first duly sworn on oath, deposes and states that all statements herein made are made on behalf of Contractor, that this deponent is authorized to make them, and that the statements contained herein are true and correct.

Contractor deposes, states, and certifies that Contractor complies with the provisions of the Employment of Illinois Workers on Public Works Act as they may apply to this Project.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,

Attest/Witness

By: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

Subscribed and sworn to before me  
this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

My Commission Expires:

\_\_\_\_\_  
Notary Public

\_\_\_\_\_  
SEAL







CERTIFICATE 00 62 16.13  
ADDITIONAL INSUREDS  
(SAMPLE FORM)

POLICY NUMBER: ( \_\_\_\_\_ )

COMMERCIAL GENERAL  
LIABILITY

**THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY.**

**ADDITIONAL INSURED - OWNERS, LESSEES OR  
CONTRACTORS (FORM B)**

This endorsement modified insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

**SCHEDULE**

**Name of Person or Organizations:**

(OWNER)  
(BAXTER & WOODMAN, INC.)  
(Others as required by the Contract Documents)

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that insured by or for you.

\_\_\_\_\_  
Authorized Representative

This \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_



CERTIFICATE 00 62 16.16  
ADDITIONAL INSUREDS  
(SAMPLE FORM)

POLICY NUMBER ( )

PROPERTY INSURANCE

**THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY.**

**ADDITIONAL INSURED - OWNERS, LESSEES OR  
CONTRACTORS (FORM B)**

This endorsement modified insurance provided under the following:

PROPERTY INSURANCE

**SCHEDULE**

**Name of Person or Organizations:**

(OWNER)  
(BAXTER & WOODMAN, INC.)  
(Others as required by the Contract Documents)

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that insured by or for you.

\_\_\_\_\_  
Authorized Representative

This \_\_\_ day of \_\_\_\_\_, 20\_\_





CERTIFICATE 00 62 16.19  
ADDITIONAL INSUREDS  
(SAMPLE FORM)

POLICY NUMBER (\_\_\_\_\_)

COMPLETED OPERATIONS

**THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY.**

**ADDITIONAL INSURED - OWNERS, LESSEES OR  
CONTRACTORS (FORM B)**

This endorsement modified insurance provided under the following:

COMPLETED OPERATIONS LIABILITY COVERAGE

**SCHEDULE**

**Name of Person or Organizations:**

(OWNER)  
(BAXTER & WOODMAN, INC.)  
(Others as required by the Contract Documents)

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that insured by or for you.

\_\_\_\_\_  
Authorized Representative

This \_\_\_ day of \_\_\_\_\_, 20\_\_



CERTIFICATE 00 62 16.21  
ADDITIONAL INSUREDS  
(SAMPLE FORM)

POLICY NUMBER (\_\_\_\_\_)

EXCESS/UMBRELLA LIABILITY

**THIS ENDORSEMENT CHANGES THE POLICY, PLEASE READ IT CAREFULLY.**

**ADDITIONAL INSURED - OWNERS, LESSEES OR  
CONTRACTORS (FORM B)**

This endorsement modified insurance provided under the following:

EXCESS/UMBRELLA LIABILITY COVERAGE PART

**SCHEDULE**

**Name of Person or Organizations:**

(OWNER)  
(BAXTER & WOODMAN, INC.)  
(Others as required by the Contract Documents)

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that insured by or for you.

\_\_\_\_\_  
Authorized Representative

This \_\_\_ day of \_\_\_\_\_, 20\_\_







00 62 76.02  
PARTIAL WAIVER OF LIEN  
(SAMPLE FORM)

STATE OF ILLINOIS  
COUNTY OF \_\_\_\_\_

} SS

Gty # \_\_\_\_\_

Loan # \_\_\_\_\_

TO WHOM IT MAY CONCERN:

WHEREAS the undersigned has been employed by \_\_\_\_\_

to furnish \_\_\_\_\_

for the premises known \_\_\_\_\_

as \_\_\_\_\_

of which \_\_\_\_\_ is the owner.

THE undersigned, for and in consideration of \_\_\_\_\_  
\_\_\_\_\_ (\$ \_\_\_\_\_) Dollars, and other good and valuable considerations, the receipt  
whereof is hereby acknowledged do(es) hereby waive and release any and all lien or claim or right of lien under  
the Statutes of the State of Illinois, relating to Mechanic's liens, on the above described premises and  
improvements thereon, and on the monies or other considerations due or to become from the owner, on  
account of labor or services, material, fixtures or apparatus heretofore furnished to this date by the undersigned  
for the above described premises.

Given under \_\_\_\_\_ hand \_\_\_\_\_ and seal \_\_\_\_\_ this  
\_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

\_\_\_\_\_  
SEAL

\_\_\_\_\_  
SEAL

Note: All waivers must be for the full amount paid. If waiver is for a corporation, corporate name should be used, corporate seal affixed and title of officer signing waiver should be set forth; if waiver is for a partnership, the partnership name should be used, partner should sign and designate himself as partner.









00 62 76.04  
FINAL WAIVER OF LIEN  
(SAMPLE FORM)

STATE OF ILLINOIS  
COUNTY OF

} SS

Gty # \_\_\_\_\_

Loan # \_\_\_\_\_

TO WHOM IT MAY CONCERN:

WHEREAS the undersigned has been employed by \_\_\_\_\_

to furnish \_\_\_\_\_

for the premises known \_\_\_\_\_

as \_\_\_\_\_

of which \_\_\_\_\_ is the owner.

THE undersigned, for and in consideration of \_\_\_\_\_

(\$

)

\_\_\_\_\_ Dollars, and other good and valuable considerations, the

receipt

\_\_\_\_\_ whereof is hereby acknowledged do(es) hereby waive and release any and all lien or claim or right of lien under the Statutes of the State of Illinois, relating to Mechanic's liens, on the above described premises and improvements thereon, and on the monies or other considerations due or to become from the owner, on account of labor or services, material, fixtures or apparatus heretofore furnished to this date by the undersigned for the above described premises.

Given under \_\_\_\_\_ hand \_\_\_\_\_ and seal \_\_\_\_\_ this

\_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

SEAL

SEAL

Note: All waivers must be for the full amount paid. If waiver is for a corporation, corporate name should be used, corporate seal affixed and title of officer signing waiver should be set forth; if waiver is for a partnership, the partnership name should be used, partner should sign and designate himself as partner.



00 62 76.13  
SALES TAX FORM



**Illinois Department of Revenue**

Office of Local Government Services  
Sales Tax Exemption Section, 3-520  
101 W. Jefferson Street  
Springfield, Illinois 62702  
217 782-8881

**COPY**

July 14, 2000

Effective January 1, 2000, we have renewed your governmental exemption from payment of the Retailers' Occupation Tax, the Service Occupation Tax (both state and local), the Use Tax, and the Service Use Tax, as required by Illinois law. Your organization is not, however, exempt from Illinois Hotel Operators' Occupation Tax, Electricity Excise Tax, Electricity Distribution Tax, and Telecommunications Excise Tax.

We have issued the following new tax exemption identification number:

The terms and conditions governing use of your exemption number remain unchanged.

Office of Local Government Services  
Illinois Department of Revenue

**NOTE: CONTRACTOR TO RECEIVE A COPY OF OWNER'S  
LETTER AS PART OF PROJECT CONTRACT DOCUMENTS**

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WORK CHANGE DIRECTIVE FORM

NO. \_\_\_\_\_

PROJECT: \_\_\_\_\_ DATE OF ISSUANCE: \_\_\_\_\_

OWNER: \_\_\_\_\_ ENGINEER: Baxter & Woodman, Inc.  
8678 Ridgefield Road  
Crystal Lake, IL 60012

CONTRACTOR: \_\_\_\_\_ ENGINEER'S PROJECT NO: \_\_\_\_\_

You are directed to proceed promptly with the following change(s):

Description:

Purpose of Work Directive Change:

Attachments:

If a claim is made that the above change(s) have affected Contract Price or Contract Time, any claim for a Change Order based thereon will involve one of the following methods of determining the effect of the change(s).

Method of determining change in Contract Price:

Method of determining change in Contract Time:

- Time and materials
- Unit prices
- Cost plus fixed fee
- Other \_\_\_\_\_
- \_\_\_\_\_

- Contractor's records
- Engineer's records
- Other \_\_\_\_\_

Estimated increase(decrease) in Contract Price: \$\_\_\_\_\_. If the Change involves an increase, the estimated amount is not to be exceeded without further authorization.

Estimated increase(decrease) in Contract Time: \_\_\_\_\_ days. If the Change involves an increase, the estimated amount is not to be exceeded without further authorization.

RECOMMENDED: BAXTER & WOODMAN, INC.

AUTHORIZED: OWNER

By \_\_\_\_\_  
Name  
Title

By \_\_\_\_\_  
Name  
Title



CHANGE ORDER FORM

PROJECT: \_\_\_\_\_ DATE OF ISSUANCE: \_\_\_\_\_

OWNER: \_\_\_\_\_ ENGINEER: Baxter & Woodman, Inc.

CONTRACTOR: \_\_\_\_\_ ENGINEER's Project No. \_\_\_\_\_

You are directed to make the following changes in the Contract Documents:

Description: \_\_\_\_\_

Purpose of Change Order: \_\_\_\_\_

Attachments: \_\_\_\_\_

CHANGE IN CONTRACT PRICE:

Original Contract Price: \$ \_\_\_\_\_

Previous Change Orders:  
No. - to No. - \$ \_\_\_\_\_

Current Contract Price: \$ \_\_\_\_\_

Net increase/decrease of this Change Order: \$ \_\_\_\_\_

Contract Price with this Change Order: \$ \_\_\_\_\_

CHANGE IN CONTRACT TIME:

Original Contract Time:  
Substantial Completion:  
Completion: \_\_\_\_\_

Change from previous Change Orders: \_\_\_\_\_

Current Contract Time:  
Substantial Completion:  
Completion: \_\_\_\_\_

Net increase/decrease of this Change Order: \_\_\_\_\_

Contract Time with this Change Order:  
Substantial Completion:  
Completion: \_\_\_\_\_

**NOTE: USE ANYTIME THE CHANGE ORDER EXCEEDS \$10,000 ± OR 30 DAYS EXTENSION.**

Pursuant to 720 ILCS 5/33E-9, (1) the circumstances said to necessitate the change in performance were not reasonably foreseeable at the time the contract was signed, (2) the change is germane to the original contract as signed, and (3) the change order is in the best interest of the Village of Municipality Name, Illinois.

PREPARED BY:  
BAXTER & WOODMAN, INC.

APPROVED:  
Municipality

ACCEPTED:  
Contractor

By \_\_\_\_\_  
Insert Name  
Construction Project Manager

By \_\_\_\_\_  
Insert Name  
Insert Title

By \_\_\_\_\_  
Insert Name  
Insert Title

RECOMMENDED BY:

By \_\_\_\_\_  
Insert Name  
Client Manager



CERTIFICATE 00 65 16

CERTIFICATE OF SUBSTANTIAL COMPLETION FORM

**PROJECT:** **ENGINEER'S Project No.:** \_\_\_\_\_

**CONTRACTOR:** **CONTRACT DATE:** \_\_\_\_\_

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

**TO:** [Owner] \_\_\_\_\_

**AND TO:** [Contractor] \_\_\_\_\_

The Work to which this Certificate applies has been observed by authorized representatives of Owner, Contractor, and Engineer, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on \_\_\_\_\_ (Date of Substantial Completion).

A tentative list of items to be completed or corrected [follows -- is attached hereto]. This list may not be all-inclusive, and failure to include an item does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by Contractor within \_\_\_\_\_ calendar days of the above date of Substantial Completion.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, and warranties shall be as follows:

**RESPONSIBILITIES:**

**Owner:** \_\_\_\_\_

**Contractor:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

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

---

Executed by Engineer's Project Manager and Client Manager on \_\_\_\_\_, 20\_\_\_\_\_.

**BAXTER & WOODMAN, INC.**

By: \_\_\_\_\_

Client Manager

By: \_\_\_\_\_

Project Manager

Contractor accepts this Certificate of Substantial Completion on \_\_\_\_\_, 20\_\_\_\_\_.

**CONTRACTOR NAME - ALL CAPS**

By: \_\_\_\_\_

Name  
Title

Owner accepts this Certificate of Substantial Completion on \_\_\_\_\_, 20\_\_\_\_\_.

**OWNER NAME - ALL CAPS**

By: \_\_\_\_\_

Name  
Title

CERTIFICATE OF COMPLETION FORM

---

**ENGINEER'S PROJECT NO.:** \_\_\_\_\_

**PROJECT:** \_\_\_\_\_  
\_\_\_\_\_

**CONSTRUCTION CONTRACT DATE:** \_\_\_\_\_

---

**TO** \_\_\_\_\_

**AND TO** \_\_\_\_\_

The undersigned hereby gives notice that the completed work furnished and performed by Contractor under the Contract for the above Project is acceptable expressly subject to the provisions of the Contract and the terms and conditions set forth on the reverse side hereof.

BAXTER & WOODMAN, INC.  
CONSULTING ENGINEERS

By: \_\_\_\_\_

Date: \_\_\_\_\_, 20\_\_\_\_\_

---

---

The Notice on the front side of this paper is expressly made subject to the following terms and conditions:

1. Said Notice is given with the skill and care ordinarily used by members of the Engineering profession practicing under similar conditions at the same time and in the same locality.
2. Said Notice reflects and is an expression of the professional judgment of Engineer.
3. Said Notice is given as to the best of Engineer's knowledge, information and belief.
4. Said Notice is based entirely on the expressly limited scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Work) under Engineer's Agreement with Owner and under the Contract reference on the reverse hereof, and applies only to facts that are within Engineer's knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under Engineer's Agreement with Owner and the Contract referenced on the reverse hereof.
5. Said Notice is not a guarantee or warranty of Contractor's performance under the above-referenced Contract referenced on the reverse hereof nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents.



00 65 36  
WARRANTY FORM  
(SAMPLE FORM)

**TO BE TRANSFERRED TO THE CONTRACTOR'S LETTERHEAD**

Owner (see Bid Form) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Subject:** \_\_\_\_\_ - \_\_\_\_\_

Dear \_\_\_\_\_:

We, the \_\_\_\_\_, Contractor on the subject Project, hereby guarantee for a period of \_\_\_\_\_, commencing \_\_\_\_\_ and ending \_\_\_\_\_, that should any defect due to improper materials or workmanship develop during the period of the guarantee, the same shall be made good by us without expense to the \_\_\_\_\_.

This guarantee is for all work except that equipment separately guaranteed as called for under Section 01 61 01 of the Specifications.

Very truly yours,

A B C, INC.

\_\_\_\_\_

\_\_\_\_\_:

C: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

**ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE**

and

Issued and Published Jointly by



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Endorsed by



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**STANDARD GENERAL CONDITIONS OF THE  
CONSTRUCTION CONTRACT**

**TABLE OF CONTENTS**

	<b>Page</b>
Article 1 – Definitions and Terminology .....	7
1.01 Defined Terms.....	7
1.02 Terminology .....	11
Article 2 – Preliminary Matters .....	12
2.01 Delivery of Bonds and Evidence of Insurance .....	12
2.02 Copies of Documents .....	12
2.03 Commencement of Contract Times; Notice to Proceed.....	12
2.04 Starting the Work .....	12
2.05 Before Starting Construction .....	13
2.06 Preconstruction Conference; Designation of Authorized Representatives .....	13
2.07 Initial Acceptance of Schedules .....	13
Article 3 – Contract Documents: Intent, Amending, Reuse .....	14
3.01 Intent.....	14
3.02 Reference Standards.....	14
3.03 Reporting and Resolving Discrepancies.....	14
3.04 Amending and Supplementing Contract Documents .....	15
3.05 Reuse of Documents .....	15
3.06 Electronic Data.....	16
Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points.....	16
4.01 Availability of Lands.....	16
4.02 Subsurface and Physical Conditions.....	17
4.03 Differing Subsurface or Physical Conditions .....	17
4.04 Underground Facilities.....	18
4.05 Reference Points.....	19
4.06 Hazardous Environmental Condition at Site .....	20
Article 5 – Bonds and Insurance.....	21
5.01 Performance, Payment, and Other Bonds.....	21
5.02 Licensed Sureties and Insurers.....	22
5.03 Certificates of Insurance .....	22
5.04 Contractor’s Insurance .....	23
5.05 Owner’s Liability Insurance.....	24
5.06 Property Insurance.....	24
5.07 Waiver of Rights .....	25
5.08 Receipt and Application of Insurance Proceeds .....	26
5.09 Acceptance of Bonds and Insurance; Option to Replace .....	27

5.10	Partial Utilization, Acknowledgment of Property Insurer.....	27
<b>Article 6 – Contractor’s Responsibilities .....</b>		
6.01	Supervision and Superintendence.....	27
6.02	Labor; Working Hours.....	27
6.03	Services, Materials, and Equipment .....	28
6.04	Progress Schedule .....	28
6.05	Substitutes and “Or-Equals” .....	28
6.06	Concerning Subcontractors, Suppliers, and Others.....	31
6.07	Patent Fees and Royalties .....	32
6.08	Permits.....	33
6.09	Laws and Regulations .....	33
6.10	Taxes .....	33
6.11	Use of Site and Other Areas.....	33
6.12	Record Documents.....	34
6.13	Safety and Protection .....	34
6.14	Safety Representative.....	35
6.15	Hazard Communication Programs.....	35
6.16	Emergencies .....	36
6.17	Shop Drawings and Samples .....	36
6.18	Continuing the Work.....	38
6.19	Contractor’s General Warranty and Guarantee .....	38
6.20	Indemnification .....	38
6.21	Delegation of Professional Design Services.....	39
<b>Article 7 – Other Work at the Site.....</b>		
7.01	Related Work at Site .....	40
7.02	Coordination.....	40
7.03	Legal Relationships.....	41
<b>Article 8 – Owner’s Responsibilities.....</b>		
8.01	Communications to Contractor.....	41
8.02	Replacement of Engineer.....	41
8.03	Furnish Data .....	41
8.04	Pay When Due.....	41
8.05	Lands and Easements; Reports and Tests.....	41
8.06	Insurance.....	42
8.07	Change Orders.....	42
8.08	Inspections, Tests, and Approvals .....	42
8.09	Limitations on Owner’s Responsibilities .....	42
8.10	Undisclosed Hazardous Environmental Condition .....	42
8.11	Evidence of Financial Arrangements.....	42
8.12	Compliance with Safety Program .....	42
<b>Article 9 – Engineer’s Status During Construction.....</b>		
9.01	Owner’s Representative .....	42
9.02	Visits to Site .....	42
9.03	Project Representative.....	43

9.04	Authorized Variations in Work .....	43
9.05	Rejecting Defective Work.....	43
9.06	Shop Drawings, Change Orders and Payments .....	44
9.07	Determinations for Unit Price Work .....	44
9.08	Decisions on Requirements of Contract Documents and Acceptability of Work .....	44
9.09	Limitations on Engineer’s Authority and Responsibilities .....	44
9.10	Compliance with Safety Program .....	45
Article 10 – Changes in the Work; Claims .....		45
10.01	Authorized Changes in the Work .....	45
10.02	Unauthorized Changes in the Work.....	45
10.03	Execution of Change Orders.....	46
10.04	Notification to Surety.....	46
10.05	Claims.....	46
Article 11 – Cost of the Work; Allowances; Unit Price Work .....		47
11.01	Cost of the Work.....	47
11.02	Allowances .....	50
11.03	Unit Price Work .....	50
Article 12 – Change of Contract Price; Change of Contract Times .....		51
12.01	Change of Contract Price .....	51
12.02	Change of Contract Times .....	52
12.03	Delays.....	52
Article 13 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....		53
13.01	Notice of Defects.....	53
13.02	Access to Work .....	53
13.03	Tests and Inspections .....	53
13.04	Uncovering Work.....	54
13.05	Owner May Stop the Work.....	54
13.06	Correction or Removal of Defective Work .....	55
13.07	Correction Period .....	55
13.08	Acceptance of Defective Work.....	56
13.09	Owner May Correct Defective Work .....	56
Article 14 – Payments to Contractor and Completion .....		57
14.01	Schedule of Values.....	57
14.02	Progress Payments .....	57
14.03	Contractor’s Warranty of Title.....	59
14.04	Substantial Completion.....	60
14.05	Partial Utilization .....	60
14.06	Final Inspection .....	61
14.07	Final Payment.....	61
14.08	Final Completion Delayed .....	62
14.09	Waiver of Claims .....	63
Article 15 – Suspension of Work and Termination .....		63
15.01	Owner May Suspend Work.....	63

15.02 Owner May Terminate for Cause .....	63
15.03 Owner May Terminate For Convenience .....	64
15.04 Contractor May Stop Work or Terminate.....	65
Article 16 – Dispute Resolution .....	65
16.01 Methods and Procedures .....	65
Article 17 – Miscellaneous .....	66
17.01 Giving Notice .....	66
17.02 Computation of Times .....	66
17.03 Cumulative Remedies .....	66
17.04 Survival of Obligations .....	66
17.05 Controlling Law .....	66
17.06 Headings.....	66



## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

### 1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
  2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
  3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
  4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
  5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
  7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
  8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
  9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
  10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
  11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
  12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop

Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order

following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

## 1.02 *Terminology*

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

### B. *Intent of Certain Terms or Adjectives:*

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

### C. *Day:*

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

### D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
  - a. does not conform to the Contract Documents; or
  - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
  - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

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

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

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
  3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
  4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## **ARTICLE 2 – PRELIMINARY MATTERS**

### *2.01 Delivery of Bonds and Evidence of Insurance*

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

### *2.02 Copies of Documents*

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

### *2.03 Commencement of Contract Times; Notice to Proceed*

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

### *2.04 Starting the Work*

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

## 2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
  2. a preliminary Schedule of Submittals; and
  3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

## 2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

## 2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
  2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

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

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

#### **3.01 *Intent***

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

#### **3.02 *Reference Standards***

- A. Standards, Specifications, Codes, Laws, and Regulations
  1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
  2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

#### **3.03 *Reporting and Resolving Discrepancies***

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



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

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
  - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
  - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
  1. A Field Order;
  2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
  3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
  1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

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

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

### 3.06 *Electronic Data*

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

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

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

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

### 4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

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

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

#### 4.02 *Subsurface and Physical Conditions*

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

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

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

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

#### 4.03 *Differing Subsurface or Physical Conditions*

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

1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

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

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

C. *Possible Price and Times Adjustments*:

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
  - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
  - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
  - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
  - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
  - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

#### 4.04 *Underground Facilities*

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

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

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
  - a. reviewing and checking all such information and data;
  - b. locating all Underground Facilities shown or indicated in the Contract Documents;
  - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
  - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

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

#### 4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such “technical data” is identified in the Supplementary Conditions. Except for such reliance on such “technical data,” Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
  2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
  3. any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to

be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

## **ARTICLE 5 – BONDS AND INSURANCE**

### **5.01 *Performance, Payment, and Other Bonds***

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

- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

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

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor’s obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor’s liability under the indemnities granted to Owner in the Contract Documents.



#### 5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
  2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
  3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
  4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:
    - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
    - b. by any other person for any other reason;
  5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
  6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
  2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
  3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
6. include completed operations coverage:
  - a. Such insurance shall remain in effect for two years after final payment.
  - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

#### 5.05 *Owner's Liability Insurance*

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

#### 5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
  1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
  2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
  3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
  5. allow for partial utilization of the Work by Owner;
  6. include testing and startup; and
  7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.
- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

#### 5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other

and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:
  - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
  - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

#### 5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

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

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

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

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

**ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES**

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

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

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

6.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
  - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
  - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

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

1. *“Or-Equal” Items:* If in Engineer’s sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an “or-equal” item, in which case review and approval of the proposed item may, in Engineer’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
  - a. in the exercise of reasonable judgment Engineer determines that:
    - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
    - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
    - 3) it has a proven record of performance and availability of responsive service.
  - b. Contractor certifies that, if approved and incorporated into the Work:
    - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
    - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
2. *Substitute Items:*
  - a. If in Engineer’s sole discretion an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
  - b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
  - c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
  - d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
    - 1) shall certify that the proposed substitute item will:
      - a) perform adequately the functions and achieve the results called for by the general design,
      - b) be similar in substance to that specified, and

- c) be suited to the same use as that specified;
- 2) will state:
  - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
  - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
  - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
- 3) will identify:
  - a) all variations of the proposed substitute item from that specified, and
  - b) available engineering, sales, maintenance, repair, and replacement services; and
- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

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

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

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

E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for



making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

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

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
  2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

#### 6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

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

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

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

6.11 *Use of Site and Other Areas*

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

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

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
  3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

#### 6.12 *Record Documents*

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

#### 6.13 *Safety and Protection*

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

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
  - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
  - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
  - E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
  - F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

#### 6.14 *Safety Representative*

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

#### 6.15 *Hazard Communication Programs*

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

## 6.16 *Emergencies*

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

## 6.17 *Shop Drawings and Samples*

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

### 1. *Shop Drawings:*

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

### 2. *Samples:*

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

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

### C. *Submittal Procedures:*

- 1. Before submitting each Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

- c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
  3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

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

6.18 *Continuing the Work*

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

6.19 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
  - 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
  - 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
  - 1. observations by Engineer;
  - 2. recommendation by Engineer or payment by Owner of any progress or final payment;
  - 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
  - 4. use or occupancy of the Work or any part thereof by Owner;
  - 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
  - 6. any inspection, test, or approval by others; or
  - 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of



or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
  - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
  - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

#### 6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

## **ARTICLE 7 – OTHER WORK AT THE SITE**

### *7.01 Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
  - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
  - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

### *7.02 Coordination*

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

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
  2. the specific matters to be covered by such authority and responsibility will be itemized; and
  3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

### 7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

## **ARTICLE 8 – OWNER'S RESPONSIBILITIES**

### 8.01 *Communications to Contractor*

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

### 8.02 *Replacement of Engineer*

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

### 8.03 *Furnish Data*

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

### 8.04 *Pay When Due*

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

### 8.05 *Lands and Easements; Reports and Tests*

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

8.06 *Insurance*

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

8.07 *Change Orders*

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

8.08 *Inspections, Tests, and Approvals*

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

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

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

8.11 *Evidence of Financial Arrangements*

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

8.12 *Compliance with Safety Program*

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

**ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION**

9.01 *Owner's Representative*

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

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of

Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

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

### 9.03 *Project Representative*

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

### 9.04 *Authorized Variations in Work*

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

### 9.05 *Rejecting Defective Work*

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

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract,

tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

#### 9.10 *Compliance with Safety Program*

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

### **ARTICLE 10 – CHANGES IN THE WORK; CLAIMS**

#### 10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

#### 10.02 *Unauthorized Changes in the Work*

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

### 10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
  2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
  3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

### 10.04 *Notification to Surety*

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

### 10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).



- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
  2. approve the Claim; or
  3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

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

### *11.01 Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
  - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
  - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
  - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such

losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

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

- 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 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

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

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

## 11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
  - 1. Contractor agrees that:
    - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
    - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
  - 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

## 11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
  - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
  - 2. there is no corresponding adjustment with respect to any other item of Work; and

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

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

### *12.01 Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
  1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:
  1. a mutually acceptable fixed fee; or
  2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
    - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

- d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
- e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
- f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

#### 12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

#### 12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages

(including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

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

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

### *13.01 Notice of Defects*

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

### *13.02 Access to Work*

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

### *13.03 Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
  - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
  - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
  - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs,

or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

#### 13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

#### 13.05 *Owner May Stop the Work*

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



### 13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

### 13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. repair such defective land or areas; or
  - 2. correct such defective Work; or
  - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
  - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to

such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

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

#### 13.08 *Acceptance of Defective Work*

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

#### 13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in

Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

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

## **ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION**

### *14.01 Schedule of Values*

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

### *14.02 Progress Payments*

#### *A. Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

#### *B. Review of Applications:*

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

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
  - a. the Work has progressed to the point indicated;
  - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
  - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
  - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
  - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
  - a. to supervise, direct, or control the Work, or
  - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
  - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
  - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
  - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

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

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
  - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
  - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
  - c. there are other items entitling Owner to a set-off against the amount recommended; or
  - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

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

#### 14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

#### 14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
  1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete,

Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

#### 14.06 *Final Inspection*

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

#### 14.07 *Final Payment*

##### A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
  - b. consent of the surety, if any, to final payment;
  - c. a list of all Claims against Owner that Contractor believes are unsettled; and
  - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

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

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

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

*C. Payment Becomes Due:*

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

*14.08 Final Completion Delayed*

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



#### 14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
  2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

### **ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION**

#### 15.01 *Owner May Suspend Work*

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

#### 15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
  2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
  3. Contractor's repeated disregard of the authority of Engineer; or
  4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
  3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

### 15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
  3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other

dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

#### 15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

### **ARTICLE 16 – DISPUTE RESOLUTION**

#### 16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
2. agrees with the other party to submit the Claim to another dispute resolution process; or

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

## **ARTICLE 17 – MISCELLANEOUS**

### *17.01 Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
  1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
  2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

### *17.02 Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

### *17.03 Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

### *17.04 Survival of Obligations*

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

### *17.05 Controlling Law*

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

### *17.06 Headings*

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

## **ARTICLES 18, 19 AND 20 ADDED IN THE SUPPLEMENTARY CONDITIONS**

00 73 00.13

SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

1.1 SUPPLEMENTARY CONDITIONS

- A. These Supplementary Conditions modify, change, delete from or add to the "Standard General Conditions of the Construction Contract" EJCDC No. C-700, 2007 edition. Where any Article of the General Conditions is modified, or any Paragraph, Subparagraph, or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause shall remain in effect.

The General Conditions also may be supplemented elsewhere in the Contract Documents by provisions located in, but not necessarily limited to Division 01 of the Specifications.

1.2 ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

- A. SC-1
  - 1. The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract have the identical meaning assigned to them in said General Conditions.
- B. SC-(1.01A.17)
  - 1. The term "Drawings" and the term "Plans" shall be considered synonymous whenever and wherever used in the Contract Documents.
  - 2. The following Drawings are part of the Contract Documents:

Drawings titled: Liberty Park Pumping Station Replacement  
 Project No.: 120511.40  
 Owner: Downers Grove Sanitary District of DuPage County, Illinois  
 Sheets: Consisting of 11 sheets prepared by Baxter & Woodman, Inc.

1.3 ARTICLE 2 - PRELIMINARY MATTERS

- A. SC-2.01.B
  - 1. Delete paragraph 2.01.B in its entirety and substitute the following:
 

2.01.B When Contractor delivers the executed Agreements to Owner, Contractor shall also deliver to Owner, with copies to each additional insured indicated in paragraphs 5.03 through 5.06, certificates of insurance which Contractor is required to purchase and maintain in accordance with paragraphs 5.03 and 5.04.

- B. SC-2.02
  - 1. Delete paragraph 2.02 in its entirety and substitute the following:

2.02 "Engineer will provide an electronic copy of the Drawings and Project Manual to the Contractor at the Preconstruction Conference."
- C. SC-2.03
  - 1. Under paragraph 2.03, delete the last sentence in its entirety.
- D. SC-2.05.A
  - 1. Delete paragraph 2.05.A in its entirety.
- E. SC-2.05.A.1 through 2.05.A.3
  - 1. Delete paragraphs 2.05.A.1 through 2.05.A.3 inclusive in their entirety.
- F. SC-2.06
  - 1. Under paragraph 2.06, change "paragraph 2.05.A " to "paragraph 2.07".
- G. SC-2.07
  - 1. Delete paragraph 2.07 in its entirety and substitute the following:

2.07 Prior to submission of the first Application for Payment, but no later than 30 calendar days after Contract Times commence, Contractor shall submit to Engineer for review and approval:

    - A. A progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
    - B. A schedule of Shop Drawings and Sample submittal which will list each required submittal and the times for submitting, reviewing, and processing such submittal;
      - 1. The schedule for shop drawings shall show all submittals complete before 25 percent of Contract Price has been paid to Contractor.
      - 2. The schedule for maintenance manuals shall show all submittals complete before 50 percent of Contract Price has been paid to Contractor.
      - 3. Failure to meet either of these milestones will result in all future Pay Application Payments being delayed until such time as the milestone has been met in the opinion of the Engineer.
    - C. A schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work; and

- D. A schedule of progress payments Contractor anticipates will be earned during the course of the Work.

No progress payment shall be made to Contractor until the schedules are submitted to and acceptable to Engineer as provided below. The progress schedule will be acceptable to Engineer as providing an orderly progression of the Work to completion within any specified Milestones and the Contract Times, but such acceptance will neither impose on Engineer responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor. Contractor's schedule of Shop Drawing and Sample submissions will be acceptable to Engineer as providing a workable arrangement for reviewing and processing the required submittals. Contractor's schedule of values will be acceptable to Engineer as to form and substance.

1.4 ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

- A. SC-4.01.A
  - 1. Under paragraph 4.01.A, third sentence, insert the words "and temporary construction easements shown on the Drawings" after the word "facilities".
- B. SC-4.02.A
  - 1. Delete paragraph 4.02.A in its entirety and replace it with the following:
    - A. Reports and Drawings:
      - 1. Section 00 31 32.13 identifies those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
      - 2. The Supplementary Conditions identify those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- C. SC-4.02.B
  - 1. Under paragraph 4.02.B, delete the second sentence "Such technical data is identified in the Supplementary Conditions".
- D. SC-4.03
  - 1. Delete paragraph 4.03A in its entirety and substitute the following:
    - A. Notification by Contractor, and processing by the Engineer and Owner of Contractor's claims of differing site conditions shall be done in conformance with P.A. 91-0647.
- E. SC-4.05.A
  - 1. Under paragraph 4.05.A., delete first sentence and substitute the following:
    - A. Owner shall provide land surveys necessary to establish right-of-way, easements and property lines. Engineer will provide base lines, bench marks and reference points which in Engineer's judgment are necessary to

enable Contractor to proceed with the Work. Contractor shall provide all stakes, markers, labor and assistance required by Engineer.

2. Under paragraph 4.05.A, last sentence, insert the words "and pay" between the words "responsible" and "for".

## 1.5 ARTICLE 5 - BONDS AND INSURANCE

### A. SC-5.02 through 5.10

1. Delete paragraphs 5.02 through 5.10, inclusive in their entirety and substitute the following:

#### 5.02 Licensed Sureties and Insurers; Insurance Policies:

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Contractor shall be obtained from surety or insurance companies that are fully licensed or authorized in the jurisdiction in which the Project is located.

#### 5.03 Certificates of Insurance and Endorsements to Insurance Policies:

- A. In addition to delivering certificates of insurance in accordance with SC paragraph 2.01.B, Contractor shall also deliver to Owner, with copies to each additional insured, copies of all endorsements to the insurance policies which Contractor is required to purchase and maintain in accordance with paragraphs 5.04 and 5.06. All certificates of insurance and endorsements must be found acceptable by the Engineer prior to the Agreement being signed by the Owner. Certificate of Insurance and endorsements shall be fully completed, signed and delivered in accordance with the requirements of Article 5. Samples of Certificate of Insurance Form, and Additional Insureds endorsements, acceptable to Owner, are included in Sections 00 62 16, 00 62 16.13, 00 62 16.16, 00 62 16.19 and 00 62 16.21. Other acceptable endorsements for general liability endorsements may include a combination of CG 20 10 and CG 20 37 endorsements. Endorsements or general liability endorsements shall not exclude supervisory and inspection services.



5.04 Contractor's Insurance:

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

1. Workers' Compensation - Workers' Compensation in accordance with the laws of the State, but not less than:  
E.L. \$500,000 each accident.  
E.L. \$500,000 each employee.  
E.L. \$500,000 policy limit.
2. General Liability
  - (a) Bodily Injury Liability and Property Damage Liability in an amount not less than \$1,000,000 each occurrence and a per project aggregate of not less than \$2,000,000.
  - (b) Above to include Premises Operations, Blanket Contractual Liability, Products/Completed Operations, Independent Contractors, Broad Form Property Damage, Personal Injury and "X", "C", and "U" Exclusions deleted.
3. Automobile Liability
  - (a) \$1,000,000 - Bodily Injury and Property Damage (Combined Single Limit).
  - (b) Coverage shall include hired and non-owned automobiles.
4. Umbrella Liability - Umbrella Liability coverage in an amount not less than \$3,000,000. Such coverage shall include, but not be limited to, excess coverage for the Workers' Compensation, General Liability, and Automobile Liability policies.

The policies of insurance so required by this paragraph 5.04 to be purchased and maintained shall:

5. Be furnished by insurers with A. M. Best Company rating of at least A-(Excellent), and a financial size category of VIII or greater.
6. With respect to general liability and umbrella liability insurance required by paragraph 5.04A, include as additional insured Owner, Engineer, and Engineer's Consultants, all of whom shall be listed on such policy by name as additional insureds through an endorsement thereto which provides for no different coverage to the additional insureds than to Contractor, and include coverage for the respective officers, directors, employees, agents and other consultants of each

and any of such additional insureds. The additional insured endorsements shall provide the following:

- (a) that the coverage afforded the additional insureds will be primary and non-contributory insurance for the additional insureds with respect to claims arising out of operations performed by or on behalf of the Contractor;
  - (b) that coverage afforded the additional insureds shall not exclude claims asserted by Contractor's employees;
  - (c) that if the additional insureds have other insurance which is applicable to the loss, such other insurance will be on an excess or contingent basis;
  - (d) that the amount of Contractor's liability under the insurance policy will not be reduced by the existence of such other insurance.
7. Include contractual liability insurance covering Contractor's indemnity obligations under paragraphs 6.07, 6.11, and 6.20, including, but not limited to, all fees and charges of engineers, architects, attorneys and other professionals, and all court, arbitration, or other dispute resolution costs;
  8. Remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing or replacing defective work in accordance with paragraph 13.06; and
  9. With respect to completed operations insurance remain in effect for at least two years after final payment (and Contractor shall furnish Owner and any other additional insured to whom an insurance policy has been furnished evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter).

5.05 Section Reserved.

5.06 Property Insurance:

- A. Contractor shall purchase and maintain property insurance in the amount of the initial Contract Price as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis. This insurance shall include interests of Owner, Contractor, Subcontractors in the Work, and the Engineer, all of whom shall be listed by name as insureds or additional insureds. Property insurance coverage shall:
  1. Be written on a replacement cost basis on an "all-risk" Builder's Risk insurance form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework and Work in transit and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition

occasioned by enforcement of Laws and Regulations and water damage;

- 2. Include soft cost expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects) in an amount not less than 5 percent of Contract Price;
- 3. Cover materials and equipment stored at the site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by the Engineer; and
- 4. Be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with thirty days written notice to each other additional insured to whom a certificate of insurance has been issued.

5.07 Cancellation or Change:

All the policies of insurance required to be purchased and maintained by Contractor in accordance with paragraphs 5.04 and 5.06 shall contain a provision or endorsement that the coverage afforded will not be cancelled or materially changed or renewal refused until at least 30 days' prior written notice has been given to Owner, Engineer, and to each other additional insured to whom an insurance policy has been furnished.

5.08 Additional Insureds:

Additional insureds referenced in paragraphs 5.04, 5.06, and 5.07 shall be as follows:

Owner: Downers Grove Sanitary District  
 Address: 2710 Curtiss Street, Downers Grove, Illinois 60515  
 Engineer: Baxter & Woodman, Inc.  
 Address: 8678 Ridgefield Road, Crystal Lake, Illinois 60012

1.6 ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

A. SC-6.02.B

- 1. Under paragraph 6.02.B, add: The regular working hours are between 7:00 AM and 5:00 PM, Monday through Friday. In the event Contractor works more than eight hours on any weekday, or works anytime on Saturdays, Sundays, or holidays, during which time the Engineer, Resident Project Representative, or assistants are required to be present, Owner shall pay the cost for such overtime engineering services and shall deduct such cost from payments due Contractor. Overtime engineering services shall be charged at Engineer's standard hourly rates applied on a time and one-half basis for all time over eight hours on any single working day and for all hours on Saturday, and on a double time basis for all Sunday and holiday hours. If the amount due Contractor is not sufficient to

cover the cost of overtime engineering services, Contractor shall reimburse Owner in the amount necessary to cover such costs. Legal holidays include:

New Years Day	Memorial Day
Independence Day	Labor Day
Thanksgiving Day	Christmas Day

If the legal holiday falls on Saturday, all hours worked on the preceding Friday and/or the Saturday will be considered as holiday hours. If the legal holiday falls on Sunday, all hours worked on the following Monday will be considered as holiday hours.

B. SC-6.06.A

- Under paragraph 6.06.A, add: Any person employed by Contractor or Subcontractors who does not perform his work in a proper and skillful manner, or who is intemperate, disorderly, or otherwise objectionable, shall, at the written request of Owner, be forthwith removed from the project site and shall not be employed again in any portion of the Work without written consent of Owner.

C. SC-6.06.B

- Under paragraph 6.06.B, add: Contractor shall identify all Subcontractors, major Suppliers and other persons or organizations providing principal items of work, material, and equipment. Contractor shall within ten working days of the date on the Notice of Award identify and submit in writing to the Engineer for Owner acceptance the names, addresses, and telephone numbers of all Subcontractors, Major Suppliers, and other persons or organizations providing principal items of work, material, and equipment.

D. SC-6.19.A

- Delete paragraph 6.19.A in its entirety and substitute the following:

6.19.A Contractor shall execute and deliver to Owner, before the final payment will be issued, a written warranty which guarantees that all work is in accordance with the Contract Documents and will not be defective. This warranty shall guarantee all work for a period of three years from the date of acceptance of the Work and final payment by Owner, except for equipment, motors, electrical controls, and other mechanical devices which shall be guaranteed for a period of two years from the date of acceptance and use of each item of equipment by Owner unless a different guarantee period of time is specified under other parts of the Contract Documents.

If within these guarantee periods or such longer period of time as may be prescribed by the Contract Documents, any work is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, either correct such defective work, or, if it has been rejected by Owner, remove it from the site and replace it with nondefective work. If Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective work corrected or the rejected work removed and replaced, and all direct and indirect costs of such repair and/or replacement of work,

including compensation for additional professional services, shall be paid or reimbursed to Owner by Contractor.

Contractor shall furnish a warranty bond in an amount equal to five percent (5%) of the Contract Price, but not less than \$10,000, by a surety satisfactory to Owner to guarantee Contractor's warranty to repair or replace defective work. The warranty bond shall be in addition to Contractor's contract Performance-Payment Bond, and shall be delivered to Owner prior to final payment to Contractor for the Work.

E. SC-6.20.A

1. Under paragraph 6.20.A, add:

In addition, Contractor shall indemnify, hold harmless, and pay for the defense of Owner and Engineer from and against claims, losses, or damages in regard to any act or failure to act by Owner or Engineer in connection with general supervision, observation and/or coordination of Contractor's operations.

Contractor shall, at its own expense, appear, defend, and pay all fees of attorneys and all costs and other expenses arising therefrom or incurred in connection therewith; and, if any judgments shall be rendered against any individual or entity indemnified hereunder in any such action, Contractor shall, at its own expense, satisfy and discharge same. Contractor expressly understands and agrees that any Letter of Credit or insurance protection required by the Contract, or otherwise provided by Contractor, shall in no way limit the responsibility to indemnify, keep, and save harmless, and defend any individual or entity indemnified hereunder as herein provided.

F. SC-6.20.C-D.

1. Delete paragraphs 6.20.C.1 and 6.20.C.2 and replace them with new paragraphs 6.20.C.1 and D.:

1. The preparation of Drawings, Specifications, or Property Surveys.

- D. For any matter for which Owner and Engineer are indemnified under Paragraph 6.20.A, Contractor shall pay for Owner's and Engineer's reasonable defense, 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 or awards until Owner or Engineer are found negligent. If Owner or Engineer are found negligent, Owner or Engineer shall reimburse Contractor for the prorata extent of Owner's or Engineer's negligence for the cost of Owner's or Engineer's reasonable defense.

G. SC-6.21

1. Under paragraph 6.21, add two new subparagraphs:

F. The design professional providing the design calculations and design drawings shall be licensed in the State of Illinois.

G. The design calculation and design drawings are not shop drawings, but shall be submitted to Engineer separately along with the required

shop drawings for the system, material, or equipment specified. These calculations will be forwarded to Owner for its records.

H. SC 6.22

1. Add new paragraph 6.22 as follows:

6.22 Construction Debris Manifest: Prepare documentation identifying the hauler, generator, place of origin of debris or soil, the weight or volume of debris or soil, and the location, owner, and operator of the facility where debris or soil was transferred, disposed, recycled or treated. This documentation must be maintained by the Contractor for three (3) years: (IL Public Act 90-761).

1.7 ARTICLE 8 - OWNER'S RESPONSIBILITIES

A. SC-8.06

1. Delete paragraph 8.06 in its entirety.

1.8 ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

A. SC-9.03

1. Under paragraph 9.03.A., delete the second sentence.
2. Under paragraph 9.03A add the following:

A LISTING OF THE DUTIES, RESPONSIBILITIES AND LIMITATIONS OF AUTHORITY OF THE RESIDENT PROJECT REPRESENTATIVE (RPR).

**A. General**

RPR is Engineer's agent at the site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's dealings in matters pertaining to the on-site work shall in general be with Engineer and Contractor keeping Owner advised as necessary. RPR's dealings with subcontractors will only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner with the knowledge of and under the direction of Engineer.

**B. Duties and Responsibilities of RPR**

1. *Schedules:* Review the progress schedule, schedule of the Shop Drawing submittals and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.
2. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

3. *Liaison:*
  - a. Serve as Engineer's liaison with Contractor, working principally through Contractor's superintendent and assist in understanding the intent of the Contract Documents; and assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-site operations.
  - b. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
  
4. *Shop Drawings and Samples:*
  - a. Record date of receipt of Shop Drawings and samples.
  - b. Receive samples which are furnished at the site by Contractor, and notify Engineer of availability of samples for examination.
  - c. Advise Engineer and Contractor of the commencement of any Work requiring a Shop Drawing or sample if the submittal has not been approved by Engineer.
  
5. *Review of Work, Rejection of Defective Work, Inspections and Tests:*
  - a. Conduct on-site observations of the Work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
  - b. Report to Engineer whenever RPR believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made: and advise Engineer of Work that RPR believes should be corrected or rejected or uncovered for observation, or requires special testing, inspection and approval.
  - c. Verify that tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that Contractor maintains adequate records thereof; and observe, record and report to Engineer appropriate details relative to the test procedures and startups.
  - d. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to Engineer.
  
6. *Interpretation of Contract Documents:* Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
  
7. *Modifications:* Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report with RPR's recommendations to Engineer. Transmit to Contractor decisions as issued by Engineer.

8. *Records:*
  - a. Maintain at the job site orderly files for correspondence, reports of job conference, Shop Drawings and samples, reproductions of original Contract Documents including all Work Directive Changes, Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Contract, Engineer's clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.
  - b. Complete a Daily Report recording Contractor hours on the job site, weather conditions, data relative to questions or Work Directive Changes, Change Orders or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send original to Engineer.
  - c. Record names, address and telephone numbers of all Contractors, subcontractors and major suppliers of materials and equipment.
9. *Reports:*
  - a. Furnish Engineer periodic reports as required of progress of the Work and the Contractor's compliance with the progress scheduled and schedule of Shop Drawings and sample submittals.
  - b. Consult with Engineer in advance of schedule major tests, inspections or start of important phases of the Work.
  - c. Draft Field Orders, obtain backup material from Contractor and recommend to Engineer Change Orders and Work Directive Changes. Furnish Engineer copies of all Field Orders.
  - d. Report immediately to Engineer and Owner upon occurrence of any accident.
10. *Payment Requests:* Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values. Work completed and materials and equipment delivered at the site but not incorporated in the Work.
11. *Certificates, Operation and Maintenance Manuals:* During the course of the Work, verify that certificates, operation and maintenance manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to Engineer for review and forwarding to Owner prior to final payment for the Work.



12. *Completion:*
  - a. Before Engineer issues a Certificate of Substantial Completion, prepare and furnish to the Engineer a list of observed items requiring completion or correction.
  - b. Conduct final inspection in the company of Engineer, Owner, and Contractor and prepare and furnish to the Engineer a final list of items to be completed or corrected.
  - c. Observe that all items on final list have been completed or corrected and make recommendations to Engineer concerning acceptance.

**C. Limitations of Authority**

Resident Project Representative:

1. Shall not authorize any deviation from the Contract Documents or substitution of materials or equipment, unless authorized by Engineer.
2. Shall not exceed limitations of Engineer's authority as set forth in the Agreement or the Contract Documents.
3. Shall not undertake any of the responsibilities of Contractor, subcontractors or Contractor's superintendent.
4. Shall not advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures or construction unless such advice or directions are specifically required by the Contract Documents.
5. Shall not advise on, issue directions relative or assume control over safety precautions and programs in connection with the Work.
6. Shall not accept Shop Drawing or sample submittals from anyone other than Contractor.
7. Shall not authorize Owner to occupy the Project in whole or in part.
8. Shall not participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by Engineer.

1.9 ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

A. SC-12.04 through 12.06

1. Add the following paragraphs:

12.04 Start and Completion Times

The date of beginning and the time for completion of the Work are essential conditions of the Agreement and the Work required shall be commenced on a date specified in the Notice to Proceed.

12.05 Time for Completion

Contractor shall proceed with the Work at such rate of progress to insure full completion within the Contract Times. It is expressly understood and agreed, by and between the Contractor and the Owner, that the Contract Times for the completion of the Work described herein is a reasonable time, taking into consideration the adverse weather conditions for the season, or seasons, involved and other factors prevailing in the locality of the Work.

12.06 Liquidated Damages

Contractor understands that time is of the essence and that Owner will suffer financial loss if the Work is not completed within the times or by the dates specified in the Bid Form, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. Contractor also recognizes 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, Contractor shall pay Owner as liquidated damages for delay (but not as a penalty) **\$1,200.00** for each day that expires after the time or date specified in the Bid Form for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner **\$600.00** for each day that expires after the time or date specified in the Bid Form for completion and readiness for final payment. Liquidated damages accrued after the Substantial Completion date will be withheld from the project retention until the work is substantially completed. Liquidated damages accrued after the final completion date will also be withheld from the project retention until final completion is achieved. If the amount of project retention is not sufficient enough to cover the amount of accrued liquidated damages for substantial and final completion, further payments to the Contractor will be withheld until to the project is substantially and final completed.

1.10 ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

A. SC-13.10

1. Add new paragraph 13.10 as follows:

13.10 Notification and Time Limit for Repairs:

- A. Contractor shall be responsible for the proper and safe protection of his work at all times during construction and also during the three-year guarantee period after the acceptance of the completed work by Owner. Contractor shall provide, erect, and maintain barricades, red flags, and torches and lights at all places where work is in progress, and wherever else required by Owner.
- B. Contractor shall maintain an emergency phone number where he/she can be notified at any time, Sundays and holidays included, of an emergency condition due to the work which requires immediate repair or protection. Upon such notification by Owner, Contractor shall be given a two-hour time limit to provide whatever barricades, flags, torches and lights are required to mark and protect the hazard. If Contractor fails to provide this protection within the two-hour period from time of notification, Owner will provide the necessary protection and deduct the sum of \$200.00 for each occurrence from the monies due and payable to Contractor for completed work.
- C. Also, upon notification by Owner, Contractor shall be given a 24-hour time limit to begin to make any repairs to the Work as deemed necessary by Owner. If Contractor fails to proceed with necessary repairs within the 24-hour notification period, Owner will make the necessary repairs to the Work and deduct the cost of labor and materials, including engineering costs, for each repair incident from the monies due and payable to Contractor for completed work.

1.11 ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

A. SC-14.01

1. Add the following paragraph after paragraph 14.01.A:

- B. Contractor shall submit revisions to the initial schedule of progress payments whenever actual outlays for the Work vary beyond -5 percent and +10 percent from the schedule, as determined by Engineer.

B. SC-14.02

1. Under paragraph 14.02.A.1, delete the remainder of the first sentence after "(but not more than one a month)" and insert the following:  
Contractor shall submit to Engineer for review an original plus four duplicate copies of each Application for Payment and each copy shall be accompanied by a "Sworn Statement For Contractor And Subcontractor To Owner" on a pre-printed or computer generated form similar to Certificate 00 62 76.01.

2. Delete paragraph 14.02.A.3, and substitute the following:

Periodic partial payments shall be for the value of the completed work less a retained amount of 10 percent of the value of completed work as approved by Engineer until construction is 50 percent complete, after which no additional amount will be retained if Contractor is making progress to Owner's satisfaction and there is no specific cause for withholding 10 percent of the total value of completed work. When the project is substantially complete and available for Owner's operational or beneficial occupancy, the retained amount shall be reduced to only that amount estimated by Engineer as necessary to assure completion of the Work, unless, in the opinion of the Engineer and Owner, Substantial and Final Completion will not be achieved by the designated completion dates established by the Notice to Proceed, as described by Article 12.06 of the Supplementary Conditions. The final payment, including the retained amount, shall be payable within 30 days after the completion of the Work, approval by Engineer and acceptance by Owner. The acceptance of the final payment by Contractor shall be considered to be a waiver of all claims against Owner under the Agreement.

C. SC-14.02.C

1. Under paragraph 14.02.C, change "Ten" to "Within 30".

D. SC-14.03

1. Under paragraph 14.03.A, add the following:

- B. Contractor shall procure from each Subcontractor and Supplier of material or labor a waiver of any claim which they may have under the mechanics lien laws of the state in which the Work is located, to insure Owner immunity from mechanics liens on account of anything which is done by Contractor or his Subcontractors in carrying out the Agreement and any work orders for additions thereto, all as a condition of any payment by Owner. Any payments made by Owner without requiring compliance with this paragraph shall not be construed as a waiver by Owner of the right to require compliance with this paragraph as a condition of later payments. Contractor shall furnish with his final Application for Payment a complete release of all liens arising out of this contract, or receipts in full in lieu thereof and an affidavit that the releases and receipts include all labor and material for which a lien could be filed.

E. SC-14.07

1. Under paragraph 14.07.C, change "Thirty" to "Sixty".

1.12 ARTICLE 18 - EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION NOTICE

18.01 Equal Employment

- A. Contractor shall comply with the following Equal Employment Opportunity - Affirmative Action Clause required by the Illinois Department of Human Rights:
  1. In the event the Contractor's noncompliance with any provision of this Equal Employment Opportunity - Affirmative Action Clause, the Illinois Human Rights

Act or the Department of Human Rights Rules and Regulations for Public Contracts, the Contractor may be declared nonresponsible and therefore ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation. During the performance of the Work under this Agreement, the Contractor agrees as follows:

- a. That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, ancestry, physical or mental handicap unrelated to ability, or an unfavorable discharge from military service; and further, that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.
- b. That, if it hires additional employees in order to perform the Work under this Agreement, or any portion hereof, it will determine the availability (in accordance with the Department's Rules and Regulations for Public Contracts) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.
- c. That it will have written sexual harassment policies that shall include, at a minimum, the following information: the illegality of sexual harassment; the definition of sexual harassment under State law; a description of sexual harassment, utilizing examples; the Contractor's internal complaint process including penalties; the legal recourse, investigative and complaint process available through the Department of Human Rights and the Illinois Human Rights Commission; directions on how to contact these State agencies; and protection against retaliation as provided by Section 6-101 of the Illinois Human Rights Act.
- d. That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, national origin, ancestry, physical or mental handicap unrelated to ability, or an unfavorable discharge from military service.
- e. That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Contractor's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations for Public Contracts. If any such labor organization or representative fails or refuses to cooperate with the Contractor in its efforts to comply with such Act and Rules and Regulations, the Contractor will promptly so notify the Illinois Department of Human Rights and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.
- f. That it will submit reports as required by the Illinois Department of Human Rights' Rules and Regulations, furnish all relevant information as may from

time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations.

- g. That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Illinois Department of Human Rights for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations.
  - h. That it will include verbatim or by reference the provisions of Paragraphs a through h of this clause in every performance subcontract as defined in Section 1.1(17)(b) of the Department's Rules and Regulations so that such provisions will be binding upon every such Subcontractor; and that it will also so include the provisions of Paragraphs a, f, g, and h in every supply subcontract as defined in Section 1.1(17)(a) of the Department's Rules and Regulations so that such provisions will be binding upon every such Subcontractor. In the same manner as with other provisions of this Agreement, the Contractor will be liable for compliance with applicable provisions of this clause by all its Subcontractors, and further, it will promptly notify the contracting agency and the Illinois Department of Human Rights in the event any Subcontractor fails or refuses to comply therewith. In addition, no Contractor will utilize any Subcontractor declared by the Department to be nonresponsible and therefore ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations.
2. Contractor and Subcontractor shall in turn include this Equal Employment Opportunity - Affirmative Action Clause in each of its subcontracts verbatim or by reference so that the provisions of Paragraphs a through h of said clause will binding upon Subcontractors of every tier; provided, however, that only Paragraphs a, f, g, and h need be included in every subcontract as defined in Section 2.10(a) of the Rules and regulations of the Illinois Department of Human Rights.

## 1.13 ARTICLE 19 - PREVAILING WAGE RATES

### A. SC-19.01 Prevailing Wage Rates

- 1. Contractor shall comply with the Prevailing Wage Act, 820 ILCS 130/.01 et seq. except where a prevailing wage violates a federal law, order, or ruling, the rate conforming to the federal law, order, or ruling shall govern. All Contractors and Subcontractors rendering service under this Agreement must comply with the Act.
- 2. Contractor shall comply with the prevailing wage rates as determined by the Illinois Department of Labor on their website.
- 3. If the Department of Labor revises prevailing wage rates, the revised prevailing wage rates on the Department of Labor's website shall apply to this contract and the Contractor will not be allowed additional compensation on account of said revisions. The Contractor shall review the wage rates applicable to the work of the contract at regular intervals to ensure timely payment of current wage rates. The Contractor agrees no additional notice is required. The Contractor shall be

responsible to notify each subcontractor of the wage rates set forth in this contract and any revisions thereto.

4. It shall be mandatory upon the Contractor or construction manager to whom a contract for public works is awarded to post, at a location on the project site of the public works that is easily accessible to the workers engaged on the project, the prevailing wage rates for each craft or type of work or mechanic needed to execute the contract or project or work to be performed. A failure to post prevailing wage rates required by this section is a violation of 820 ILCS 130/4.
5. Contractor shall provide certified payrolls each month to demonstrate compliance with regulations.

B. SC-19.02 Payroll Records

1. The Contractor and each subcontractor shall make and keep, for a period of not less than five years from the date of the last payment on a contract or subcontract, records of all laborers, mechanics, and other workers employed by them on the project; the records shall include information required by 820 ILCS 130/5 for each worker. Upon seven business days' notice, the Contractor and each subcontractor shall make available for inspection and copying at a location within this State during reasonable hours, the payroll records to the public body in charge of the project, its officers and agents, the Director of Labor and his deputies and agents, and to Federal, State, or local law enforcement agencies and prosecutors.

C. SC-19.03 Submission of payroll records.

1. The Contractor and each subcontractor shall, no later than the 15th day of each calendar month, file a certified payroll for the immediately preceding month with the public body in charge of the project, except that the full social security number and home address shall not be included on weekly transmittals. Instead the payrolls shall include an identification number for each employee (e.g., the last four digits of the employee's social security number). The certified payroll shall consist of a complete copy of the payroll records except starting and ending times of work each day may be omitted.

The certified payroll shall be accompanied by a statement signed by the Contractor or subcontractor or an officer, employee, or agent of the Contractor or subcontractor which states that: (i) he or she has examined the certified payroll records required to be submitted by the act and such records are true and accurate; (ii) the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required; and (iii) the Contractor or subcontractor is aware that filing a certified payroll that he or she knows to be false is a Class A misdemeanor.

D. SC-19.04 Employees interviews.

1. The Contractor and each subcontractor shall permit his/her employees to be interviewed on the job, during working hours, by compliance investigators of the Department of Labor.

1.14 ARTICLE 20 – STEEL PRODUCTS PROCUREMENT

A. SC-20.01 Steel Products Procurement

1. Contractor shall comply with the provisions of Illinois Steel Products Procurement Act (30 ILCS 565/) as it may be amended from time to time.

1.15 ARTICLE 21 - EMPLOYMENT OF ILLINOIS WORKERS ON PUBLIC WORKS ACT

- A. SC-21.01 Comply with the provisions of the Employment of Illinois Workers on Public Works Act (30 ILCS 570/) as they may apply to this Project.

1.16 ARTICLE 22 – UNCONTAMINATED SOIL CERTIFICATION AND DISPOSAL

- A. SC-22.01 Comply with the requirements of Sections 22.51(f)(2)(B) and 22.51a(d)(2)(B) of the Illinois Environmental Protection Act ([415 ILCS5/22.51(f)(2)(B)] and [415 ILCS5/22.51a(d)(2)(B)]) for the disposal of uncontaminated soils including uncontaminated soil mixed with other clean construction or demolition debris (CCDD) materials. Provide soil testing and professional engineering services needed to certify the uncontaminated soils (LPC-663) unless the Bidding Documents state that the Owner will provide the uncontaminated soils certification.

SC-22.02 Soils which cannot be certified as uncontaminated or soils that are found to be contaminated during the course of the Work shall be tested and disposed as required for Contaminated Waste Disposal.

END OF SUPPLEMENTARY CONDITIONS



SECTION 01 14 11

CONTRACTOR USE OF PREMISES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section applies to all situations in which the Contractor or his representatives including, but not necessarily limited to, suppliers, subcontractors, employees, and field engineers, enter upon the Owner's property.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- F. Provide a list of names and identification of all persons to be entering the Owner's property in connection with the Work of this Contract, and submit a copy of the list to the Owner at the preconstruction conference.
  - 1. Advise the Owner of personnel changes at project meetings.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Do not store construction equipment, tools or materials on any area of the Owner's property except where shown on the Drawings as the "Contractor's Storage Area," or where otherwise directed by the Engineer.

1.5 SITE CONDITIONS – Reserved.

CONTRACTOR USE OF PREMISES

01 14 11-1 (120511.40)

1.6 MAINTENANCE – Reserved.

1.7 USE AND RESTORATION OF THE SITE

- A. Before submitting Final Application for Payment, restore all areas within the work site boundaries disturbed by the Work to a fully regraded condition, provided with at least four (4) inches of hand raked topsoil and sodded per Section 32 92 00.
- B. Clean all permanent roadways used for construction activities by using motorized street sweeper that utilizes vacuum and water to pick up debris, when directed by Engineer.

1.8 CONTRACTOR'S INGRESS AND EGRESS

- A. Contractor's vehicles:
  - 1. Require Contractor's vehicles and vehicles belonging to employees of the Contractor to park on the existing pumping station site, or at locations as directed by the Engineer.
  - 2. Do not permit such vehicles to park on any street except where directed by the Engineer.
- B. Restoration:
  - 1. Clean and restore to at least the preconstruction condition all roadways, streets, sidewalks, driveways, and parking areas used during construction.
  - 2. Restore lawn and right-of-way areas to at least preconstruction conditions.

1.9 PROTECTION OF EXISTING PROPERTY AND EQUIPMENT

- A. Property:
  - 1. Take all necessary precautions to protect existing structures, piping, trees and all other facilities from damage during construction, and comply with Section 31 23 79, paragraph 3.2 of these Specifications.
  - 2. Repair or replace all property damaged during construction.
  - 3. Prevent entry of all foreign materials including excavated earth and/or backfill into structures, sewers, or other pipelines.

1.10 DISPOSAL OF SPOIL

- A. Remove all spoil, excess excavated material, or other construction activity residual materials from the work site. Do not deposit this material on private or public property without written permission from property owner or authorized representative of the appropriate public agency.

1.11 SECURITY

- A. Restrict the access of all persons entering upon the Owner's property in connection with the Work.

END OF SECTION

SECTION 01 21 13  
CASH ALLOWANCE

PART 1 - GENERAL

1.1 SUMMARY

- A. To provide adequate budget to cover items not precisely determined prior to bidding, allow within the proposed Contract Price amounts described in this Section.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 CASH ALLOWANCE

- A. From time to time it might be necessary to add unforeseen additional work to the Project. The intent of the Cash Allowance is to provide a means to fund reasonable charges and additions to the Project. The value of any work covered by the Cash Allowance(s) will be determined in accordance with the General Conditions and Supplementary Conditions.
- B. Do not include any overhead and profit amount in the Project base bid for the Cash Allowance. Include the appropriate overhead and profit in each item funded from the Cash Allowance.
- C. Include in the Lump Sum price a Cash Allowance of Five Thousand and 00/100 Dollars (**\$5,000.00**) for tree, bush/shrub, and mulch landscaping; revisions to pavements; and/or other Owner determined additional work.

END OF SECTION

CASH ALLOWANCE  
01 21 13-1 (120511.40)



## SECTION 01 26 13

## REQUESTS FOR INTERPRETATION

## PART 1 - GENERAL

## 1.1 SUMMARY: REQUESTS FOR INTERPRETATION (RFI)

- A. The Contractor may submit Requests For Interpretation (RFI) to the Engineer to expedite the Contractor's performance on the Project. RFIs will be submitted following the requirements, all as described in this Section.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 of these Specifications.
  - 2. Individual requirements for submittals will be described in pertinent Sections of these Specifications.
- C. Work not included:
  - 1. Incomplete submittals will not be reviewed by the Engineer.
  - 2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer unless specifically called for within the Contract Documents.
- D. References:
  - 1. Reserved.

## 1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Make submittals of RFIs in accordance with the provisions of this Section.
- F. Prior to submitting each RFI, the Contractor shall first carefully study and compare the Contract Documents, field conditions, other Owner provided information, Contractor prepared Coordination Drawings, and prior Project correspondence and documentation to determine that the information requested is not reasonably obtainable from such sources.

## REQUESTS FOR INTERPRETATION

01 26 13-1 (120511.40)

- G. The Contractor shall submit each RFI sufficiently in advance of the date by which such information is required to allow the Engineer sufficient time, in the Engineer's professional judgement, to permit adequate review and response and to permit Contractor compliance with the latest construction schedule.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

2.1 This Subsection intentionally left blank.

## PART 3 - EXECUTION

### 3.1 IDENTIFICATION OF SUBMITTALS

- A. Each RFI shall be submitted to the Engineer, in writing, on such form and with such accompanying information as the Engineer may require for such purpose. Each RFI shall identify the specific sources reviewed by the Contractor in its efforts to determine the information requested, and a statement to the effect that the information being requested could not be determined from such sources.
- B. Consecutively number all submittals.
  - 1. When material is submitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
  - 2. On re-submittals, cite the original submittal number for reference.
- C. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
  - 1. Use Request for Interpretation (RFI) Form, Section 01 26 13.13.
- D. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.
- E. Submittal log:
  - 1. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times, the date of the request, to whom the request was made, by whom the request was made, the nature of the request, and the Engineer's resolution thereof.
  - 2. Make the submittal log available to the Engineer for the Engineer's review upon request.
  - 3. Review this log at each Project Meeting and make the resolution of RFIs a part of the minutes of such meetings.

END OF SECTION

01 26 13.13

REQUEST FOR INTERPRETATION (RFI) FORM

RFI NO. \_\_\_\_\_

Contractor requests for interpretation will be considered upon receipt of this completed RFI Form. By submission of this form the Contractor attests to the fact that having carefully reviewed the Contract Documents and coordinated the Work with the appropriate trades and reviewed field conditions, that the information requested cannot be determined from such efforts as called for in the General Conditions of the Contract.

Date: \_\_\_\_\_ Project: \_\_\_\_\_

To: \_\_\_\_\_

Description of Requested Interpretation: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Specification References: \_\_\_\_\_

Drawing References: \_\_\_\_\_

Proposed method of resolving issue.      Sketches and/or Pages Attached: \_\_\_\_\_ Yes, \_\_\_\_\_ No

\_\_\_\_\_

\_\_\_\_\_

Potential impact on project cost: \_\_\_\_\_

Response Date: \_\_\_\_\_ List date by which response by Engineer is requested to maintain project schedule. (Allow sufficient time for response).

Signed: \_\_\_\_\_, Project Superintendent  
Signature signifies acceptance of responsibility for accuracy and completeness of information.

ENGINEER'S RESPONSE

Notations listed below indicate the Engineer's action on method proposed by the Contractor to resolve issues or remarks in response to RFI when no Contractor recommendation has been provided. Changes to Contract Amount and/or project time shall be processed using standard Change Order Forms.      Sketches and/or Pages Attached \_\_\_\_\_ Yes \_\_\_\_\_ No

\_\_\_\_\_

\_\_\_\_\_

Signed: \_\_\_\_\_ Date: \_\_\_\_\_





SECTION 01 31 19  
PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Work included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Engineer will conduct project meetings throughout the construction period.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. The Contractor's relations with his subcontractors and materials suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meetings content.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Agenda items: To the maximum extent practicable, advise the Engineer at least 24 hours in advance of project meetings regarding items to be added to the agenda.
- F. Minutes:
  - 1. The Engineer will compile minutes of each project meeting, and will furnish three copies to the Contractor and required copies to the Owner.
  - 2. Recipients of copies may make and distribute such other copies as they wish.

1.3 QUALITY ASSURANCE

- A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

2.1 No products are required in this Section.

## PART 3 - EXECUTION

### 3.1 MEETING SCHEDULE

- A. Project meetings will be scheduled at the Preconstruction Meeting.
- B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

### 3.2 MEETING LOCATION

- A. The Engineer will establish meeting location. To the maximum extent practicable, meetings will be held at the job site.

### 3.3 PRECONSTRUCTION MEETING

- A. Preconstruction Meeting will be scheduled to be held within 20 working days after the effective date of the Agreement.
  - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
  - 2. The Engineer will advise other interested parties, including the Owner, and request their attendance.
- B. Minimum agenda: Data will be distributed and discussed on at least the following items:
  - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and Engineer.
  - 2. Channels and procedures for communications.
  - 3. Construction schedule, including sequence of critical work.
  - 4. Contract Documents, including distribution of required copies of original Documents and revisions.
  - 5. Processing of Shop Drawings and other data submitted to the Engineer for review.
  - 6. Processing of Bulletins, field decisions, and Change Orders.
  - 7. Rules and regulations governing performance of the Work; and
  - 8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

### 3.4 PROJECT MEETINGS

- A. Progress meetings will be held throughout progress of the Work at intervals agreed to by Owner, Engineer and Contractor. Interval will generally be weekly.
- B. Contractor's project manager, job superintendent, major subcontractors and suppliers shall attend, as appropriate, to address agenda topics for each meeting. Contractor's representatives shall have authority to bind Contractor to decisions at the meetings.
- C. The project schedule shall be updated monthly and shall be reviewed at each progress meeting. Contractor shall provide the following information in written form at each meeting.
  - 1. Construction progress, including:
    - a. Activities completed this reporting period.
    - b. Activities in progress this reporting period.
    - c. Activities scheduled to commence this reporting period.
  - 2. Description of problem areas.
  - 3. Current and anticipated delays.
    - a. Cause of the delay.
    - b. Corrective action and schedule adjustments to correct the delay.
    - c. Impact of the delay on other activities, on milestones, and on completion dates.
  - 4. Changes in construction sequence.

END OF SECTION



## SECTION 01 32 16

## CONSTRUCTION PROGRESS SCHEDULES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Prepare and maintain the schedules and reports described in this Section to assure adequate planning and execution of the Work so that the Work is completed within the Contract Times, and to assist the Engineer in appraising the reasonableness of the proposed schedule and in evaluating progress of the Work.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Requirements for progress schedule: General Conditions.
  - 3. Construction period: Form of Agreement.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.
- F. Construction schedule: Prior to submission of the first Application for Payment, but no later than 30 calendar days after Contract Times commence, submit to the Engineer one reproducible copy and four prints of a construction schedule prepared in accordance with Part 3 of this Section.
- G. Periodic reports: Update the construction progress monthly and submit it to the Engineer prior to submittal of each Application for Payment for completed work.
  - 1. Submit four prints of the construction schedule updated as described in Part 3 of this Section.

## 1.3 QUALITY ASSURANCE

- A. Perform data preparation, analysis, charting, and updating in accordance with standards approved by the Engineer.

## CONSTRUCTION PROGRESS SCHEDULES

01 32 16-1 (120511.40)

- B. Reliance upon the approved schedule:
  - 1. The construction schedule as approved by the Engineer will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
  - 2. Processing of the first Application for Payment will not be completed by the Engineer until the construction schedule has been submitted in accordance with 1.2 F. above.
  - 3. Processing of the 50 percent and 80 percent progress payment applications will not be completed by the Engineer until the periodic reports have been submitted in accordance with 1.2 G. above.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 CONSTRUCTION ANALYSIS

- A. Graphically show by Critical-Path (CPM), Program Evaluation and Review Technique (PERT), Precedence Methods, bar-chart, or other means acceptable to the Engineer, the order and interdependence of all activities necessary to complete the Work, and the sequence in which each activity is to be accomplished, as planned by the Contractor and his project field superintendent in coordination with all subcontractors whose work is shown on the diagram.
- B. Include, but do not necessarily limit indicated activities to:
  - 1. Project mobilization.
  - 2. Work elements.
  - 3. Special material and equipment installation and testing.
  - 4. Final cleanup.
  - 5. Final inspecting and testing.
  - 6. All activities by the Engineer that affect progress, required dates for completion, or both, for all and each part of the work.
  - 7. Contractor's anticipated working dates.

## PART 3 - EXECUTION

### 3.1 CONSTRUCTION SCHEDULE

- A. As soon as practicable after receipt of Notice to Proceed, complete the construction schedule in preliminary form, meet with the Engineer, review contents of the proposed construction schedule, and make all revisions agreed upon.
- B. Submit in accordance with Paragraph 1.2 F. above.

### 3.2 PERIODIC REPORTS

- A. As required under Paragraph 1.2 G. above, update the approved construction schedule.
  - 1. Indicate "actual" progress in percent completion for each activity;
  - 2. Provide written narrative summary of revisions causing delay in the program, and an explanation of corrective actions taken or proposed.

### 3.3 REVISIONS

- A. Make only those revisions to approved construction schedule as are approved in advance by the Engineer.

END OF SECTION





## SECTION 01 33 01

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Provide submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements, all as described in this Section.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Individual requirements for submittals will be described in pertinent Sections of these Specifications.
- C. Work not included:
  - 1. Submittals not required by the various Specification Sections of the Contract Documents will not be reviewed by the Engineer.
  - 2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer unless specifically called for within the Contract Documents.
- D. References:
  - 1. Reserved.

##### 1.2 SUBMITTALS

- A. Provide submittals of Shop Drawings, Samples, progress schedules and other items required in the Contract Documents in accordance with the provisions of this Section.

##### 1.3 QUALITY ASSURANCE

- A. Coordination of submittals:
  - 1. Review and coordinate all aspects of each item being submitted.
  - 2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
  - 3. Certify that this coordination has been performed by affixing the Contractor's signature to each Contractor's Submittal Transmittal Form Attachment 01 33 01.

### SUBMITTALS

01 33 01-1 (120511.40)

- B. Resubmittals and reimbursement of Engineer's costs.
  - 1. The Engineer will record all time used by the Engineer in the review of any third and subsequent submittals.
  - 2. The Owner will reimburse the Engineer at the Engineer's standard hourly rate for all time spent in such third and subsequent reviews and deduct such costs from payments due the Contractor.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 SHOP DRAWINGS

- A. Provide Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.
  - 1. Shop Drawings are not required for manholes, valve vaults, catch basins, pipe, and appurtenances needed for infrastructure systems (storm sewers, sanitary sewers, and water distribution) so long as the items are the materials and manufacturers specified in the project manual.
- B. Submit Shop Drawings electronically to the Engineer as a single .pdf file set.
  - 1. Attach, as the first page of each Shop Drawing, a completely executed Contractor's Submittal Transmittal Form Attachment 01 33 01.
  - 2. Collate the electronic .pdf file to include all data pertaining to the Shop Drawing Submittal in one .pdf set.
    - a. Separate .pdf files submitted will be cause for rejection and the Shop Drawing will be returned to the Contractor.
  - 3. In cases where Electronic Shop Drawing files exceed a size that is practical for electronic transmission via electronic mail or through an FTP site, the Contractor may and will be required to submit up to five (5) .pdf file shop drawing submittals on separate compact discs or removable USB storage, if requested, plus the quantity of discs or removable USB storage that will be required to be returned to the Contractor.
- C. Submit all required shop drawings for a specification section at the same time under one Contractor's Submittal Transmittal Form Attachment 01 33 01.
- D. Do not submit partial submittals of an item within a specification section or use a separate Contractor's Submittal Transmittal Form for separate items within a particular section.
- E. Identify exceptions or items that do not comply with the specifications and provide explanation for exception or non-compliance.

- F. For Shop Drawings required to be resubmitted for review, include the following:
1. A completely executed cover sheet Contractor's Submittal Transmittal Form Attachment 01 33 01.
  2. A cover letter responding to each of the review comments returned to the Contractor by the Engineer with the previous review and specifically stating:
    - a. If the equipment and resubmitted data provided complies with the review comment(s) then provide:
      - (1) How the equipment complies.
      - (2) Specifically indicate where support documentation can be located in the shop drawing.
    - b. If the equipment and resubmitted data provided cannot or does not comply with the review comment(s) then provide:
      - (1) What instead is being provided to comply.
      - (2) Justification as to why the Contractor feels the Engineer should consider it acceptable to allow the Contractor to not comply with the specification.
  3. Resubmission of a complete and fully-inclusive shop drawing with all data pertinent to the item(s) being submitted.
    - a. Partial submission of data that only addresses the Engineer's specific review comments, or a portion thereof; and does not include all data for a complete resubmittal; will be cause for immediate rejection.
- G. Upon completion of the Engineers review of the Shop Drawings, one electronic .pdf file will be returned to the Contractor for their distribution.
1. Upon the request of the Engineer or Owner at any time, the Contractor shall provide up to four (4) color, hard copy, shop drawing submittals.
  2. Upon the request of the Engineer or Owner at any time, the Contractor shall provide up to four (4) .pdf file shop drawing submittals on separate compact discs or removable USB storage.

## 2.2 MANUFACTURERS' LITERATURE

- A. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly indicate which portion of the contents is being submitted for review by highlighting, circling, or other means, or by crossing out contents that do not pertain to the submittal and are not to be considered.
1. This also applies to specifically indicating, when applicable, which optional items will or will not be provided with items specified.

## 2.3 SAMPLES

- A. Provide Sample or Samples identical to the precise article proposed to be provided.
1. Identify as described under "Identification of Submittals" below.
- B. Number of Samples required:
1. Unless otherwise specified, submit Samples in the quantity which is required to be returned, plus one which will be retained by the Engineer.

2. By prearrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the Engineer.
3. Because submittals shall be submitted to the Engineer in an electronic format as described herein, the Contractor shall specifically indicate on the Contractor's Submittal Transmittal Form Attachment 01 33 01 included with each submittal (when samples are required) when and where the physical samples will or have been transmitted for physical observation.
4. Include as part of the electronic submittal a .pdf copy of any and all transmittals, shipping information, signatures of receipt, etc. identifying the transmission and receipt of the said sample(s).

## 2.4 COLORS AND PATTERNS

- A. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Engineer for selection.

## 2.5 MANUFACTURERS' RECOMMENDED INSTALLATION PROCEDURES

- A. Maintain in a safe place at the site one copy of manufacturers' recommended installation procedures for all equipment and materials.
  1. Make these installation procedures readily available to the Engineer for reference.
- B. When the manufacturers' recommended installation procedures are submitted as part of the shop drawings required by the Contract Documents, approval of such installation procedures by the Engineer will not be required.

## PART 3 - EXECUTION

### 3.1 IDENTIFICATION OF SUBMITTALS

- A. Consecutively number all submittals, beginning with identifying number "001" for the first submittal delivered by the Contractor.
  1. When items are submitted for any reason, transmit under a new Contractor's Submittal Transmittal Form Attachment 01 33 01 and with a new transmittal number.
  2. When material is resubmitted for any reason, cite the original identifying submittal number followed by insertion of a letter "A" for the first resubmittal, "B" for the second resubmittal, and so on.
- B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
  1. Use Contractor's Submittal Transmittal Form Attachment 01 33 01.
- C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

### 3.2 GROUPING OF SUBMITTALS

- A. Shop Drawings may be submitted for different specification sections under one Contractor's Submittal Transmittal Form Attachment 01 33 01, provided the items are specifically and directly related to each other such that review of the items from different specification sections is pertinent for a complete review.
1. Identify any and all items and their specific specification section(s) if included with and submitted under a differing main specification section submittal.
  2. Partial submittals may be rejected as not complying with the provisions of the Contract.
  3. The Contractor may be held liable for delays so occasioned.
  4. Do not submit unrelated items in group submittals.

### 3.3 ELECTRONIC SUBMITTAL PROCEDURES

- A. Summary:
1. Transmit submittals to Engineer in electronic (PDF) format using Submittal Exchange, a website service designed specifically for transmitting submittals between construction team members.
- B. Setup:
1. Obtain and pay for the Submittal Exchange subscription for this Project.
    - a. Contact Glenn Van Treeck at Submittal Exchange at 515.393.2471 or glenn.vantreeck@oracle.com to verify cost prior to bid.
  2. The Engineer will set up and define the requirements of the Project to be submitted, transmitted, and maintained through Submittal Exchange.
  3. At Contractor's option, training is available from Submittal Exchange regarding use of website and .pdf submittals.
    - a. Contact Submittal Exchange at 515.393.2471.
  4. Internet Service and Equipment Requirements:
    - a. Email address and Internet access at Contractor's main office.
    - b. Adobe Acrobat ([www.adobe.com](http://www.adobe.com)), Bluebeam .pdf Revu ([www.bluebeam.com](http://www.bluebeam.com)), or other similar .pdf review software for applying electronic stamps and comments.
- C. Procedures:
1. Submittal Preparation - Contractor may use any or all of the following options:
    - a. Subcontractors and Suppliers provide electronic (.pdf) submittals to Contractor via the Submittal Exchange website.
    - b. Subcontractors and Suppliers provide paper submittals to General Contractor who electronically scans and converts to .pdf format.
    - c. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to .pdf format.
  2. Review and certify by signature that the submittal complies with the requirements of the Contract Documents including verification of manufacturer/product, dimensions and coordination of information with other parts of the work.

3. Transmit each submittal to Engineer using the Submittal Exchange website, [www.submittalexchange.com](http://www.submittalexchange.com).
  4. Engineer review comments will be made available on the Submittal Exchange website for downloading.
  5. Contractor will receive email notice of completed review.
  6. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
- D. Project Close-out:
1. Submit three copies of the complete record of Submittal Exchange documents in .pdf format to the Engineer at the end of the Project.
    - a. Provide each copy on a separate compact disc or removable USB storage.

### 3.4 TIMING OF SUBMITTALS

- A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.
- B. In scheduling, allow at least ten working days for review by the Engineer following the Engineer's receipt of the submittal.

END OF SECTION

ATTACHMENT 01 33 01

CONTRACTOR'S SUBMITTAL TRANSMITTAL FORM

TO: BAXTER & WOODMAN, INC.  
8678 RIDGEFIELD ROAD  
CRYSTAL LAKE, IL 60012

DATE: \_\_\_\_\_

ATTN: \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_

FROM: \_\_\_\_\_ SPEC NO. \_\_\_\_\_

\_\_\_\_\_ ENGR. DWG. NOS. \_\_\_\_\_

\_\_\_\_\_ TRANSMITTAL NO. \_\_\_\_\_

1. The following submittals are forwarded for your review:

<u>No. of Copies</u>	<u>Manufacturer</u>	<u>Description</u>	<u>Drawing No.</u>	<u>Date</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

2. Have all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data been determined and verified? Yes \_\_\_ No \_\_\_\_\_

3. Has work indicated in this submittal been coordinated with all trades? Yes \_\_\_ No \_\_\_\_\_

4. Is work by all trades being provided as necessary to accommodate this submittal? Yes \_\_\_ No \_\_\_\_\_

5. Contractor's description and justification for deviations from Contract Documents (Use additional sheet if necessary.)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. Remarks: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Signature: \_\_\_\_\_

1/15 – IL





SECTION 01 41 26

PERMITS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes permit requirements for building and for stormwater discharges.
- B. Related Sections:
  - 1. Documents affecting work of this Section include, but are not necessary limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Other permits requirements may also be described in other Sections of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS - Reserved.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 BUILDING PERMITS

- A. Obtain all permits required, and pay all inspection fees for the respective work requiring such permits.

1.8 NPDES PHASE II STORMWATER PERMIT

- A. Not applicable. The project involves less than 1.0-acre of disturbed area.

END OF SECTION

PERMITS

01 41 26-1 (120511.40)



SECTION 01 42 13

ABBREVIATIONS AND ACRONYMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes abbreviations referenced in the Contract Documents.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 ABBREVIATIONS

- A. Referenced Standards:
  - 1. Where the Contract Documents reference any published specifications or standards of any organization or association, comply with the requirements of the specification or standards current on the date of Advertisement for Bids.
    - a. In case of a conflict between the referenced specifications or standards, the one having the more stringent requirements shall govern.
  - 2. In case of conflict between the referenced specifications or standards and the Contract Documents, the Contract Documents shall govern.

ABBREVIATIONS AND ACRONYMS

01 42 13-1 (120511.40)

B. Abbreviations:

1. The following are definitions of abbreviations that may be used within the Project Manual:
  - AA - Aluminum Association
  - AASHTO - American Association of State Highway and Transportation Officials
  - ACI - American Concrete Institute
  - AISC - American Institute of Steel Construction
  - ANSI - American National Standard Institute
  - ASTM - American Society for Testing and Materials
  - AWG - American Wire Gauge
  - AWS - American Welding Society
  - AWWA - American Water Works Association
  - CBM - Certified Ballast Manufacturers Association
  - CRSI - Concrete Reinforcing Steel Institute
  - ICEA - Insulated Cable Engineers Association
  - IEEE - Institute of Electrical and Electronics Engineers, Inc.
  - ISA - Instrument Society of America
  - FS - Federal Specifications
  - NAPF – National Association of Pipe Fabricators
  - NEC - National Electrical Code (NFPA 70)
  - NECA - National Electrical Contractors' Association
  - NEMA - National Electrical Manufacturer's Association
  - NFPA - National Fire Protection Association or National Forest Products Association
  - NSF - National Sanitation Foundation
  - OSHA - U.S. Department of Labor, Occupational Safety and Health Department
  - PS - United States Products Standards
  - IDOT "STANDARD SPECIFICATIONS" - Illinois Department of Transportation "Standard Specifications for Road and Bridge Construction" including Recurring Special Provisions and Interim Special Provisions.
  - SSPC – Society for Protective Coatings
  - UL - Underwriter's Laboratories, Inc.

END OF SECTION

## SECTION 01 45 29

## TESTING LABORATORY SERVICES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. This Section describes testing to be provided by an independent testing laboratory service.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Requirements for specific tests are described in various Sections of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS – Reserved.

## 1.3 QUALITY ASSURANCE

- A. Provide the services of a testing laboratory approved by the Engineer.
- B. Upon completion of each test and/or inspection, promptly distribute copies of test or inspection reports to the Engineer, to governmental agencies requiring submission of such reports, and to such other persons as directed by the Engineer.

## 1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

## 1.5 SITE CONDITIONS – Reserved.

## 1.6 MAINTENANCE – Reserved.

## 1.7 TESTING AGENCY DUTIES AND LIMITS OF AUTHORITY

- A. Cooperate with the Engineer and the Contractor; provide qualified personnel and equipment to perform the scope of testing work outlined.
- B. Acquaint the Engineer and the Contractor with testing procedures for special conditions encountered at the site.
- C. Perform specified monitoring, sampling, and testing of the materials and construction.
  - 1. Comply with specified standards, ASTM, other authorities, and as specified.
  - 2. Ascertain compliance with the Contract Documents.

## TESTING LABORATORY SERVICES

01 45 29-1 (120511.40)

3. Obtain written acknowledgment of sampling or testing.
- D. Give prompt written notice to the Engineer and the Contractor of irregularities or deficiencies of work which are observed during performance of service.
- E. The Laboratory is not authorized to release, revoke, alter or enlarge the Contract requirements, nor to approve or accept any portion of the work, nor to perform the duties of the Contractor.

## PART 2 - PRODUCTS

### 2.1 PAYMENT FOR TESTING

- A. Include within the Contract Price an amount sufficient to cover all testing required of the Contractor under pertinent Sections of these Specifications, and to cover all testing and inspecting required by governmental agencies having jurisdiction.
- B. The Owner will pay for all testing and inspecting specifically requested by the Engineer over and above those described in Paragraph 2.1 A. above.
- C. When tests indicate noncompliance with the Contract Documents, all testing and subsequent retesting occasioned by the noncompliance shall be performed by the same testing laboratory and the costs thereof shall be paid by the Contractor.

## PART 3 - EXECUTION

### 3.1 TAKING SPECIMENS

- A. Except as may be specifically otherwise approved by the Engineer, have the testing laboratory secure and handle all samples and specimens for testing.

### 3.2 COOPERATION WITH TESTING LABORATORY

- A. Provide access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.
- B. Furnish casual labor and facilities:
  1. To obtain and handle samples at the site or at the source of the product to be tested.
  2. To facilitate testing operations.
  3. For laboratory's exclusive use for storage and curing of test samples on site.
- C. Notify the testing agency sufficiently in advance of operations to allow for assignment of personnel and scheduling of its operations.
- D. Provide the testing laboratory with copies of approved relevant shop drawings.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes construction facilities and temporary controls required for the Work.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Comply with pertinent safety requirements and regulations for temporary facilities and controls.
  - 3. Equipment normally furnished by the individual trades in execution of their own portions of the Work is not part of this Section.
  - 4. Permanent installation and hookup of the various utility lines are described in other Sections.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

TEMPORARY FACILITIES AND CONTROLS

01 50 00-1 (120511.40)

## 1.7 REQUIREMENTS

- A. Provide construction facilities and temporary controls needed for the Work including, but not necessarily limited to:
  - 1. Temporary utilities and services such as water, electricity, and heat.
  - 2. Sanitary facilities.
  - 3. Enclosures such as fencing, tarpaulins, barricades, and canopies.
  - 4. Temporary fencing of the construction site.
  - 5. Fire extinguishers.
  - 6. Dust and mud control.
  - 7. Traffic control.
  - 8. Security.
  - 9. Right-of-way and property line control.
  - 10. Construction layout and staking.

## PART 2 - PRODUCTS

### 2.1 UTILITIES AND SERVICES DURING CONSTRUCTION

- A. Water:
  - 1. The Contractor shall provide their own tank truck and water to test the pumps, manhole, wet well, and piping.
    - a. Provide water for initial and subsequent testing as required to obtain acceptance of the improvements.
      - (1) See notes on Drawings regarding use of sewage, water from a remote site, or effluent from Owner's wastewater treatment plant for testing.
    - b. Fire hydrants proximate to the project site shall not be used by the Contractor, unless written authorization is obtained from the water system owner.
- B. Electricity:
  - 1. Provide necessary temporary wiring and, upon completion of the Work, remove such temporary facility.
  - 2. Provide area distribution boxes so located that the individual trades may furnish and use 100 feet maximum length extension cords to obtain power and lighting at points where needed for work, inspection, and safety.
  - 3. Provide and pay for electricity used in construction.
- C. Heating: Provide and maintain heat necessary for proper conduct of operations needed in the Work.

### 2.2 SANITARY FACILITIES

- A. Provide temporary sanitary facilities meeting federal, state, and local health department requirements.
  - 1. Maintain in a sanitary condition at all times.



## 2.3 ENCLOSURES

- A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.

## 2.4 TEMPORARY FENCING

- A. Provide and maintain for the duration of construction a temporary fence of design and type needed to prevent entry onto the Work by the public.
- B. Temporary work boundary fence (special).
  - 1. Provide 6-foot tall chain link fence.

## 2.5 FIRE EXTINGUISHERS

- A. Provide and maintain not less than two fire extinguishers, multi-purpose dry chemical type with UL rating of 4A-60 B:C, 10-pound capacity, Amerex Model ABC, or equal, enclosed in suitable protecting cabinets and conveniently located for proper protection.

## 2.6 CONSTRUCTION LAYOUT

- A. The Contractor shall furnish construction stakes required for layout and staking of the project.
- B. The Contractor shall provide personnel, equipment, and material to perform layout and staking and to establish supplementary benchmarks.

# PART 3 - EXECUTION

## 3.1 MAINTENANCE AND REMOVAL

- A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.
- B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Engineer.

## 3.2 DUST AND MUD CONTROL

- A. Take necessary precautions to control dust and mud associated with the Work, subject to the approval of the Engineer.
  - 1. In dry weather, spray dusty areas daily with water in order to control dust.
  - 2. Apply calcium chloride having a minimum chemical content of 77 percent calcium chloride at an application rate of 3 pounds per square yard of surface covered at locations as directed by the Engineer.

## TEMPORARY FACILITIES AND CONTROLS

01 50 00-3 (120511.40)

- B. Take necessary steps to prevent the tracking of mud onto adjacent streets.
  - 1. Wash mud resulting from the construction traffic off the adjacent streets.
  - 2. Clean all permanent roadways used for construction activities by using motorized street sweeper that utilizes vacuum and water to pick up debris, when directed by Engineer.

### 3.3 TRAFFIC CONTROL

- A. Protect and maintain traffic by the proper use of barricades, warning lights, and necessary traffic control and safety devices conforming to Federal, State, and local regulations regarding their use.
- B. Use forms of traffic control on public roadways required by the construction operations in accordance with the "Manual on Uniform Traffic Control Devices for Streets and Highways", Articles 107.09 and 107.14 of the IDOT "Standard Specifications", and the "Highway Standards".
- C. Unless the Contractor has obtained written permission from the Engineer to temporarily close any street, alley, or other traveled way, keep such traveled way open to traffic on the existing pavement.
- D. Maintain alternating one-way traffic from opposing directions during working hours. At all other times, provide sufficient width within existing shoulders to permit one lane of traffic in each direction.
- E. Ensure that all barricades, warning signs, lights, and other devices are operational 24 hours each day, including Sundays and holidays, during the time the contract is in force.
  - 1. In the event of severe weather conditions, provide any additional personnel necessary to properly maintain all traffic control devices.
- F. At the preconstruction meeting, furnish the name of the individual in the Contractor's direct employ who is to be responsible for the installation and maintenance of the traffic control for this project.
  - 1. If the actual installation and maintenance are to be accomplished by a Subcontractor, obtain the Engineer's consent at the time of the preconstruction meeting.
  - 2. The Owner will provide the Contractor with the name of its representative who will be responsible for the administration of the traffic control plan.
- G. Provide access to private driveways at all times.
- H. Maintain access for emergency vehicles at all times.
- I. The costs for traffic control will be considered incidental to the Contract and no additional compensation will be allowed.

### 3.4 SECURITY

- A. Take whatever measures are necessary to protect the safety of the public, workmen, and materials.
  - 1. Provide inspection of work area daily.
  - 2. Provide the security of the site, both day and night.

### 3.5 RIGHT-OF-WAY AND PROPERTY LINE CONTROL

- A. Protect all right-of-way markers, property line iron pins, and easement iron pins during construction.
  - 1. Flag such control points prior to construction, and protect the points during the course of construction.
- B. Establish tie-down control for any right-of-way markers or iron pins that may be lost or damaged during the work.
- C. Re-establish any right-of-way markers or iron pins that are lost or damaged during construction, after completion of restoration work.
- D. Provide the services of a Registered Land Surveyor for replacement of lost markers and pins.
  - 1. The cost for this work will be considered incidental to the Contract, and no additional compensation will be allowed.

### 3.6 CONSTRUCTION LAYOUT AND STAKING

- A. The Contractor shall place construction layout stakes for this project. The Owner will provide adequate reference points and benchmarks. Any additional control points set by the Owner will be identified in the field to the Contractor and all field notes will be maintained by the Owner.
- B. The Contractor shall establish offset stakes, reference points, and any other horizontal or vertical controls, including supplementary benchmarks necessary to secure a correct layout of the Work.
  - 1. Stakes shall be set at sufficient intervals to assure construction in conformance with the Drawings.
  - 2. The Contractor will not be required to set additional stakes to locate a utility line which is not included as a Pay Item in the contract or to determine property lines between private properties.
- C. The Contractor shall be responsible for having the finished work conform to the lines, grades, elevations, and dimensions shown on the Drawings.
  - 1. Any inspection or checking of the Contractor's layout by the Engineer and the acceptance of all or any part of the layout shall not relieve the Contractor of his/her responsibility to secure the proper dimensions, grades, and elevations of the several parts of the Work.

## TEMPORARY FACILITIES AND CONTROLS

01 50 00-5 (120511.40)

2. The Contractor shall exercise care in the preservation of stakes and benchmarks and shall have them reset when any are damaged, lost, displaced, removed, or otherwise obliterated.
- D. Responsibility of the Contractor:
1. The Contractor shall establish control points necessary to construct the individual project elements.
  2. The Contractor shall locate right-of-way and easement points. The Contractor shall set all line stakes for the construction of fences by the Contractor.
  3. All work shall be according to normally accepted self-checking surveying practices.
    - a. Field notes shall be kept in standard survey field notebooks and those books shall become the property of the Owner at the completion of the project.
    - b. All notes shall be neat, orderly, and in accepted form

END OF SECTION

SECTION 01 61 01

GENERAL EQUIPMENT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes the general equipment requirements applicable to all equipment and supplements the detailed equipment specifications.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Provide Attachment 01 61 01-1, Manufacturer's Certificate of Inspection; Attachment 01 61 01-2, Contractor's Verification of Equipment Inspection; and Attachment 01 61 01-3, Contractor's Equipment Guarantee for equipment as identified in Part 1 of the particular equipment specifications.
- B. Provide field service reports as specified below.
- C. Comply with pertinent provisions of Sections 01 33 01.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 LUBRICANTS

- A. Provide lubricants of the type recommended by the equipment manufacturer for each item of equipment in sufficient quantity for start-up and initial operation of equipment.
- B. Provide lubrication fittings readily accessible from the outside of all equipment.

GENERAL EQUIPMENT REQUIREMENTS

01 61 01-1 (120511.40)

## 2.2 ANCHORS

- A. Provide the size and number of anchor bolts, mechanical anchors and adhesive anchors determined by the equipment manufacturer unless otherwise indicated on the Drawings.
- B. Provide Type 316 stainless steel anchor bolts, threaded rods, nuts, washers, mechanical anchors, adhesive anchors, and other fastener parts for installing equipment, complying with ASTM F593 and F594.
- C. Comply with pertinent provisions of Section 05 50 00.

## PART 3 - EXECUTION

### 3.1 SHOP ASSEMBLY AND MATCHMARKING

- A. Assemble, inspect, and test equipment in the manufacturer's shop as far as is practical.
- B. Provide accurate shopmarking and identification for items to be field erected in accordance with erection details furnished with the equipment.
- C. Provide all fasteners and miscellaneous small parts to be field erected individually packaged for shipment, and identify as to location in accordance with a schedule of fasteners with the equipment.

### 3.2 INSTALLATION, INSPECTION, TESTING AND OPERATOR INSTRUCTIONS

- A. Provide the services of a qualified field service technician from the manufacturer of each piece of equipment to:
  - 1. Inspect the equipment installation including alignment, clearances, field erection where applicable, and initial lubrication where applicable.
  - 2. Ascertain that equipment has been installed in accordance with the manufacturer's recommended procedures and is ready for operation.
- B. For each site visit of the manufacturer's field service technician, submit a field service report from the field service technician within five (5) working days of the visit.
- C. After the installation has been completed in accordance with the manufacturer's recommendations and in the presence of the manufacturer's field service technician, test the equipment and its appurtenances for proper operating condition and for performance in accordance with these Specifications.
- D. Provide three (3) copies of the Manufacturer's Certificate of Inspection and the Contractor's Verification of Equipment Inspection to the Engineer certifying and verifying that the equipment and all appurtenances supplied with it have been

installed in accordance with the manufacturer's recommendations and that the test operation was satisfactory.

1. Use the forms, Attachment 01 61 01-1 and Attachment 01 61 01-2.

E. Instruct the Owner's personnel in the proper operation and maintenance of the equipment in accordance with the manufacturer's recommendations.

### 3.3 EQUIPMENT GUARANTEE

A. Guarantee all equipment, motors, electrical controls, and other mechanical devices to operate in accordance with the requirements of these Specifications and replace and repair any guaranteed item found to be defective within two years, or longer period if specifically stated for any particular item, from the date of the Owner's acceptance for use of the equipment without additional expense to the Owner for labor or materials.

1. After obtaining Owner Authorized Representative's signature, provide three (3) copies of a Contractor's Equipment Guarantee WITH ORIGINAL SIGNATURES to the Engineer, using the form, Attachment 01 61 01-3.

END OF SECTION





ATTACHMENT 01 61 01-1

**MANUFACTURER'S CERTIFICATE OF INSPECTION**

Date of Inspection: \_\_\_\_\_  
Project Name \_\_\_\_\_  
Contractor: \_\_\_\_\_  
Equipment Manufacturer: \_\_\_\_\_  
Equipment Specification: \_\_\_\_\_  
Equipment Type & Name: \_\_\_\_\_

This will certify that I, the manufacturer's representative, have completely checked and inspected the installation of this equipment and it has been properly installed in accordance with our instructions and requirements. I also certify that the equipment has been satisfactorily tested and is now ready for normal operation and use.

I have instructed the Owner's personnel in the proper operation and maintenance of the equipment which we have furnished for this project.

\_\_\_\_\_  
Manufacturer's Representative's Signature

\_\_\_\_\_  
Name and Title

Attendees:

_____ Name and Title	_____ Signature
_____ Name and Title	_____ Signature
_____ Name and Title	_____ Signature
_____ Name and Title	_____ Signature
_____ Name and Title	_____ Signature
_____ Name and Title	_____ Signature

ATTACHMENT 01 61 01-2

**CONTRACTOR'S VERIFICATION OF EQUIPMENT INSPECTION**

Date of inspection: \_\_\_\_\_

Project Name: \_\_\_\_\_

Contractor: \_\_\_\_\_

Equipment Manufacturer: \_\_\_\_\_

Equipment Specification: \_\_\_\_\_

Equipment Type & Name: \_\_\_\_\_

We, the Contractor for the subject project, hereby verify that the equipment manufacturer's serviceman has inspected and tested the installation of this equipment within the last 30 days and has certified that the equipment which we have furnished and installed for this project is now ready for normal operation and use by the Owner.

\_\_\_\_\_  
Contractor's Representative's Signature

\_\_\_\_\_  
Name and Title

ATTACHMENT 01 61 01-3

**CONTRACTOR'S EQUIPMENT GUARANTEE**

Date: \_\_\_\_\_  
Project Name: \_\_\_\_\_  
Contractor: \_\_\_\_\_  
Equipment Manufacturer: \_\_\_\_\_  
Equipment Specification: \_\_\_\_\_  
Equipment Type & Name: \_\_\_\_\_

We, the Contractor for the subject project, hereby guarantee this equipment for a period of \_\_\_ years from the date of the Owner's acceptance and use of this equipment, and shall replace or repair the equipment or any parts thereof which become defective or do not function properly during normal operation and maintenance without any additional expense to the Owner for labor or materials.

\_\_\_\_\_  
Contractor's Representative's Signature

\_\_\_\_\_  
Name and Title

ACCEPTED this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, for Owner's use and initiation of Contractor's Equipment Guarantee. The Owner hereby accepts responsibility for operation and maintenance of said equipment as of this date.

\_\_\_\_\_  
Owner's Representative's Signature

\_\_\_\_\_  
Name and Title



SECTION 01 66 11

STORAGE AND PROTECTION OF MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Additional procedures also may be described in other Sections of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with the requirements of this Section for off-site storage.
  - 1. The Engineer reserves the right to visit and observe the off-site storage areas.
- B. Store equipment and materials in accordance with the manufacturer's instructions.
- C. Provide temporary weathertight enclosures to protect products from damage by the elements.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 MANUFACTURERS' RECOMMENDATIONS

- A. Except as otherwise approved by the Engineer, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

## 1.8 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
  - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
  - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- B. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to manufacturer, grade, quality, and other pertinent information.

## 1.9 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the Engineer and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Engineer to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 01 73 29  
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the Work required to:
  - 1. Make the several parts fit properly.
  - 2. Uncover work to provide for installing, inspecting, or both, of ill-timed work.
  - 3. Remove and replace work not conforming to requirements of the Contract Documents.
  - 4. Remove and replace defective work.
  
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. In addition to other requirements specified, upon the Engineer's request uncover work to provide for inspection by the Engineer of covered work, and remove samples of installed materials for testing.
  - 3. Do not cut or alter work performed under separate contracts without the Engineer's written permission.
  
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Request for Engineer's consent:
  - 1. Prior to cutting which affects structural safety, submit written request to the Engineer for permission to proceed with cutting.
  - 2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Engineer and secure his written permission and the required Change Order prior to proceeding.

- F. Notices to the Engineer:
  - 1. Prior to cutting and patching performed pursuant to the Engineer's instructions, submit cost estimate to the Engineer. Secure the Engineer's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.
  - 2. Submit written notice to the Engineer designating the time the Work will be uncovered, to provide for the Engineer's observation.

1.2 QUALITY ASSURANCE – Reserved.

1.3 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.4 SITE CONDITIONS – Reserved.

1.5 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications.

### 2.2 PAYMENT FOR COSTS

- A. The Owner will reimburse the Contractor for cutting and patching performed pursuant to a written Change Order, after claim for such reimbursement is submitted by the Contractor. Perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Inspection:
  - 1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
  - 2. After uncovering the work, inspect conditions affecting installation of new work.
- B. Discrepancies:
  - 1. If uncovered conditions are not as anticipated, immediately notify the Engineer and secure needed directions.
  - 2. Do not proceed until unsatisfactory conditions are corrected.



3.2 PREPARATION PRIOR TO CUTTING

- A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.3 PERFORMANCE

- A. Perform required excavating and backfilling as required under pertinent other Sections of these Specifications.
- B. Perform cutting and demolition by methods which will prevent damage to other portions of the Work and provide proper surfaces to receive installation of repair and new work.
- C. Perform fitting and adjusting of products to provide finished installation complying with the manufacturer's recommendations for specified equipment, products, tolerances, and finishes.
- D. Perform slight alterations needed to make adjustable parts fit to fixed parts to provide a complete installation.
- E. Refinish surfaces as necessary to match adjacent finishes.

END OF SECTION



SECTION 01 74 23

FINAL CLEANING

PART 1 - GENERAL

1.1 SUMMARY

- A. Throughout the construction period, maintain structures and site in a standard of cleanliness as described in this Section.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. In addition to standards described in this Section, comply with requirements for cleaning as described in other pertinent Sections of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Conduct daily inspection, and more often if necessary, to verify requirements for cleanliness are being met.
- B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

- A. Use only the cleaning materials and equipment compatible with the surface being cleaned, as recommended by the manufacturer of the material.

## PART 3 - EXECUTION

### 3.1 PROGRESS CLEANING

- A. General:
1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
  2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
  3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
  4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the environment.
- B. Site:
1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
  2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet the requirements of Paragraph 3.1 A. 1. above.
  3. Maintain the site in a neat and orderly condition at all times.
- C. Structures:
1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
  2. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.

### 3.2 FINAL CLEANING

- A. "Clean", for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.
- B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Paragraph 3.1 above.
- C. Site:
1. Unless otherwise specifically directed by the Engineer, broom clean paved areas on the site and public paved areas adjacent to the site.
  2. Completely remove resultant debris.

- D. Structures:
  - 1. Exterior:
    - a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
    - b. Remove all traces of splashed materials from adjacent surfaces.
    - c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.
    - d. In the event of stubborn stains not removable with water, the Engineer may require light sandblasting or other cleaning at no additional cost to the Owner.
  - 2. Interior:
    - a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
    - b. Remove all traces of splashed material from adjacent surfaces.
- E. Schedule final cleaning as approved by the Engineer to enable the Owner to accept a completely clean Work.

### 3.3 CLEANING DURING OWNER'S OCCUPANCY

- A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by the Engineer in accordance with the General Conditions of the Contract.

END OF SECTION



SECTION 01 77 01  
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes an orderly and efficient transfer of the completed Work to the Owner.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Activities relative to Substantial Completion and Contract closeout are described in the General Conditions.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Prior to requesting the Engineer to issue a certificate of Substantial Completion in accordance with Paragraph 14.04 or 14.05 of the General Conditions, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for a joint inspection by Owner, Contractor, and Engineer.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 PROCEDURES

- A. Substantial Completion:
  - 1. Prepare and submit the list required by the first sentence of Paragraph 14.04.A of the General Conditions and submit it along with a written request that Engineer issue a certificate of Substantial Completion.
  - 2. Within a reasonable time after receipt of the list, Owner, Contractor and Engineer will jointly inspect the Work to determine status of completion.
  - 3. Should the Engineer determine that the Work is not substantially complete:
    - a. The Engineer will so notify the Contractor, in writing, giving the reasons therefore.

- b. Remedy the deficiencies and notify the Engineer when ready for reinspection.
  - c. Owner, Contractor and Engineer will reinspect the Work.
  - 4. When the Engineer concurs that the Work is substantially complete:
    - a. The Engineer will prepare a tentative "Certificate of Substantial Completion," accompanied by the Contractor's list of items to be completed or corrected, as verified by the Engineer.
    - b. The Engineer will submit the tentative Certificate to the Contractor for acceptance.
    - c. After Contractor signs and returns the tentative Certificate to Engineer, Engineer will submit the tentative Certificate to Owner accompanied by a tentative list of items to be completed or corrected before final payment.
    - d. Owner will have seven days after receipt of the tentative Certificate during which to make objection to Engineer as to any provisions of the Certificate on attached list.
      - (1) If Owner objects, Engineer will consider Owner's objections. If, after considering Owner's objections, Engineer concludes that the Work is not substantially complete, Engineer will, within fourteen days after submission of the tentative Certificate to Owner, notify Contractor in writing, stating reasons therefore. If, after considering Owner's objections, Engineer considers the Work substantially complete, Engineer will within said fourteen days execute and deliver to Owner and Contractor, a definitive Certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative Certificate as Engineer believes justified after consideration of any objections of Owner.
      - (2) If Owner has no objections, Engineer will within fourteen days after submission of the tentative Certificate to Owner and Contractor issue a definitive Certificate of Substantial Completion.
    - e. At the time of delivery of the tentative Certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, maintenance, heat, utilities, insurance, warranties, and guarantees. Unless Owner or Contractor advise the Engineer in writing of any objections within seven days after delivery of the tentative Certificate of Substantial Completion, the Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- B. Final Completion:
- 1. Prepare and submit the notice required by the first sentence of Paragraph 14.06A of the General Conditions.
  - 2. Verify that the Work is complete including, but not necessarily limited to, the items mentioned in Paragraph 14.07.A of the General Conditions.



3. Certify that:
    - a. Contract Documents have been reviewed.
    - b. Work has been inspected for compliance with the Contract Documents.
    - c. Work has been completed in accordance with the Contract Documents.
    - d. Equipment and systems have been tested as required, and are operational.
    - e. Work is completed and ready for final inspection.
  4. Owner, Contractor, and Engineer will make a joint inspection to verify status of completion.
  5. Should the Engineer determine that the Work is incomplete or defective:
    - a. The Engineer will so notify the Contractor, in writing, listing the incomplete or defective work.
    - b. The Contractor will remedy the deficiencies promptly, and notify the Engineer when ready for reinspection.
  6. When the Engineer determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.
- C. Closeout submittals include, but are not necessarily limited to:
1. Project Record Documents described in Section 01 78 39.
  2. Manufacturer's Certificate of Inspection, Contractor's Verification of Equipment Inspection, and Contractor's Equipment Guarantee for each item of equipment as required in Section 01 61 01.
  3. Warranties and bonds.
  4. Keys and keying schedule.
  5. Spare parts and materials extra stock.
  6. Evidence of compliance with requirements of governmental agencies having jurisdiction including but not necessarily limited to:
    - a. Certificates of Inspection.
  7. Certificates of Insurance for products and completed operations;
  8. Evidence of payment and release of liens; and
  9. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
- D. Final adjustment of accounts:
1. Submit a final statement of accounting to the Engineer, showing all adjustments to the Contract Price.
  2. If so required, the Engineer will prepare a final Change Order showing adjustments to the Contract Price which have not been made by previous Change Orders.

END OF SECTION

CONTRACT CLOSEOUT  
01 77 01-3 (120511.40)



SECTION 01 77 15

SEWER TELEVISIONING FOR FINAL INSPECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide preparatory cleaning of the entire sewer section before conducting the internal sewer inspection, as specified herein.
- B. Provide internal sewer inspection of the entire sewer section (manhole to manhole) by the use of a closed circuit television, as specified herein.
  - 1. Televising entire length of sewer section, even if only a portion of the sewer section has been replaced or extended.
- C. Related Work:
  - 1. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01, General Requirements, of these Specifications.
- D. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with the pertinent provisions of Section 01 33 01.
- F. Video Inspection:
  - 1. Prior to final payment for this Contract and within 10 days of performing the work, submit two copies of the sewer televising videos on digital video discs (DVDs) or flash-drive media, and written logs to the Engineer.

1.3 QUALITY ASSURANCE

- A. Utilize cleaning, televising and recording equipment meeting the requirements of Part 2 of this Section.
- B. Provide preparatory cleaning and prepare DVDs or flash-drive media, and written logs in accordance with Part 3 of this Section.

SEWER TELEVISIONING FOR FINAL INSPECTION

01 77 15-1 (120511.40)

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - EQUIPMENT

### 2.1 PREPARATORY CLEANING EQUIPMENT

A. General:

1. Provide equipment constructed for ease and safety of operation.

B. High-Velocity Jet (Hydrocleaning) Equipment:

1. Provide equipment with a selection of 2 or more nozzles capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned.
2. Accessories:
  - a. Provide a sand nozzle if the condition of the sewer necessitates.

### 2.2 INTERNAL SEWER INSPECTION EQUIPMENT

A. General:

1. Provide a closed circuit television (CCTV) and audio-video recording system for internal inspection of mainline sewer capable of producing picture quality to the satisfaction of the Owner's representative.

B. Television camera:

1. Use a digital color television camera designed and constructed for sewer inspection with the following capabilities:
  - a. High resolution color-chip camera and monitor capable of producing a minimum of 650 lines of resolution.
  - b. Adequate and adjustable directional lighting to allow a clear picture of the entire periphery of the pipe.
  - c. Provide auxiliary lighting for sewers larger than 12-inch diameter.
  - d. Operable in 100 percent humidity conditions.
  - e. Use a camera that has a 360 degree radial by 270 degree pan-and-tilt viewing field.
  - f. Remote or manually propelled.
  - g. Electric footage counters accurate to less than 1 percent error over the length of the particular sewer being inspected.
  - h. Skids where it is necessary to raise the camera in larger sewers, specifically sized for each pipe diameter to position the camera in the center of the pipe.

C. Audio-Video recording system:

1. General:
  - a. Provide a total audio-video recording system and procedures as required to produce a high quality digital video and audio production

of bright, sharp, clear pictures with accurate colors, free from distortion. The audio portion shall have proper volume and clarity and shall be free from distortion.

2. Video Record Equipment:
  - a. Record inspection electronically and create DVDs directly from digital content without an intermediate analog conversion.
  - b. Provide the documentation of the inspection in digital format (.mpg, .avi, or other approved format) and submitted on DVDs or flash-drive media.

## PART 3 - EXECUTION

### 3.1 PREPARATORY CLEANING

- A. Provide preparatory cleaning of the sewer section to permit unobstructed passage of the television camera and clean enough for the camera to discern structural defects, misalignment, and points of infiltration.
- B. Perform a light cleaning with High-Velocity Jet or power rodding equipment to flush the entire sewer section, if necessary and as directed by the Engineer, to allow televising.
- C. See Section 01 50 00 of these Specifications for methods and regulations regarding obtaining water for cleaning of sewer.
- D. Remove debris resulting from the cleaning operation from the downstream manhole of the sewer section. Passing of debris through subsequent sections is not permitted.
- E. Dispose of debris from the cleaning operation at the wastewater treatment plant or approved landfill.

### 3.2 INTERNAL SEWER INSPECTION

- A. The high-velocity jetting machine will not be allowed to operate directly in front of the camera during the inspection.
- B. Begin each digital video with the current date, project name, and Owner; followed by the general locations, manhole segment and direction of viewing superimposed on the video monitor.
- C. Professionally label all USBs and DVDs showing the Owner's name, the sewer lines recorded on the tape, the date and Contractor's name.
- D. Move the camera, at a speed no greater than 30 feet per minute and stopping when necessary to permit proper documentation of the sewer's condition.
- E. Inspect the entire length of the sewer section.

- F. Documentation:
1. Inspection Logs:
    - a. Provide inspection logs with the following information:
    - b. Owner's Name.
    - c. Inspector's Name.
    - d. Crew Chief's Name.
    - e. Date.
    - f. From MH No. \_\_\_\_ located at \_\_\_\_\_.
    - g. To MH No. \_\_\_\_ located at \_\_\_\_\_.
    - h. Direction of Flow.
    - i. Type of Pipe.
    - j. Type of Joints, if apparent.
    - k. Joint Spacing.
    - l. Cleanliness.
    - m. Manhole Conditions.
    - n. Section Length.
    - o. Pipe Size.
    - p. Depth of Pipe.
    - q. Direction of Inspection (camera movement).
    - r. Surface conditions.
    - s. Document the footage and clock orientation of all pipe defects, change in pipe material, and any other abnormal conditions.
    - t. Use terminology generally accepted by the industry.
    - u. Provide legible entries on inspection logs.
    - v. Complete inspection log in the field.
  2. Provide an audio track recorded by the inspection technician during the actual inspection describing all information documented in the Inspection Log.

### 3.3 FINAL ACCEPTANCE

- A. Provide digital video to Engineer for review as outlined in paragraph 1.2 of this Section.
- B. Retelevise sewers found to be deficient during initial television inspection, after repairs are completed, for as many times as required to obtain final acceptance.
- C. Retelevise any sewer section where final inspection videos are of insufficient quality as determined by Engineer or District.

END OF SECTION

## SECTION 01 78 26

## OPERATION AND MAINTENANCE MANUAL

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide an operation and maintenance manual described in pertinent Sections of these Specifications and as specified herein.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS

- A. Submit Operation and Maintenance Manual electronically to the Engineer as a single .pdf file set.
  - 1. Attach, as the first page of the Operation and Maintenance Manual, a completely executed Contractor's Submittal Transmittal Form Attachment 01 33 01.
- B. Revise and resubmit as necessary to establish compliance with the specified requirements, all as described in this Section.
- C. In a case where the Electronic Operation and Maintenance Manual file(s) exceed a size practical for electronic transmission via electronic mail or through an FTP site, the Contractor may and will be required to submit up to five (5) .pdf file Operation and Maintenance Manuals on separate compact discs (CDs) or removable USB storage, if requested, plus the quantity of CDs or removable USB storage that will be required to be returned to the Contractor.
- D. Upon completion of the Engineers review of the electronic Operation and Maintenance Manual, one electronic .pdf file will be returned to the Contractor for their distribution.
  - 1. Submitted Manuals found to not be in compliance will be returned with the Engineers comments for the Contractors revision and resubmission.
  - 2. Submitted Manuals found to be in compliance will be returned with the Engineers comments and marked "Submit Required Copies", at which time the contractor shall provide the number of electronic .pdf Manuals on individual CDs or removable USB storage and/or hard copy Manuals organized and bound as specified herein.

## OPERATION AND MAINTENANCE MANUAL

01 78 26-1 (120511.40)

- 3. Upon the request of the Engineer or Owner at any time, the Contractor shall provide up to four (4) color, hard copy Operation and Maintenance Manuals.
- 4. Upon the request of the Engineer or Owner at any time, the Contractor shall provide up to four (4) .pdf file Operation and Maintenance Manuals on separate compact discs or removable USB storage.

E. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE MANUAL

A. Where operation and maintenance manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provisions of this Section.

B. Hard copy format:

- 1. Size: 8½" x 11".
- 2. Paper: White bond, at least 20 lb. weight.
- 3. Text: Neatly written or printed.
- 4. Drawings: 11" in height preferable; bind in with text; foldout acceptable; larger drawings acceptable but fold to fit within the manual and provide a drawing pocket inside rear cover or bind in with text.
- 5. Flysheets: Separate each portion of the manual with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.
- 6. Binding: Use heavy-duty plastic or fiberboard covers with binding mechanism concealed inside the manual; 3-ring binders will be acceptable.
- 7. Provide front and back covers for each manual, using durable material, and clearly identified on or through the cover with at least the following information:

OPERATING AND MAINTENANCE MANUALS

( \_\_\_\_\_ )  
 ( Name and address of Work \_\_\_\_\_ )  
 ( \_\_\_\_\_ )  
 ( Name of Contractor \_\_\_\_\_ )  
 ( \_\_\_\_\_ )  
 ( General subject of this Manual \_\_\_\_\_ )  
 ( \_\_\_\_\_ )  
 ( Engineer, and approval date \_\_\_\_\_ )



- C. Electronic format:
  - 1. Provide in .pdf format as a single document.
  - 2. Provide an index and bookmarks for the sections.
  - 3. Insert blank pages as required to permit two sided printing of the manual.
  - 4. Format document for printing on 8½ x 11 and 11 x 17 paper size.
  
- D. Contents: Include at least the following:
  - 1. Index near the front of the manual, giving immediate information as to location within the manual of all emergency information regarding the installation.
  - 2. Complete instructions regarding operation and maintenance of all equipment involved including lubrication, disassembly, and reassembly.
  - 3. Complete nomenclature of all parts of the equipment.
  - 4. Complete nomenclature and part number of all replaceable parts, name and address of nearest vendor, and all other data pertinent to procurement procedures.
  - 5. Complete recommended schedule for maintenance of equipment and recommended schedule for replacement of parts and components.
  - 6. Manufacturers' bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or otherwise clearly indicating, all manufacturers' data with which this installation is not concerned.
  - 7. Measurements: Provide all measurements in U.S. standard units such as feet-and-inches, pounds, and gallons per minute.
  - 8. Such other data as required in pertinent other Sections of these Specifications.

### PART 3 - EXECUTION

#### 3.1 TIMING AND PAYMENT

- A. Make submittals far enough in advance of scheduled dates for equipment installation to provide at least ten (10) working days for review by the Engineer following the Engineer's receipt of the submittal.
  
- B. Submit required manuals for each item of equipment to the Engineer no later than 30 days following the Engineer's approval of shop drawings for said item of equipment.
  
- C. Payment for the fabrication, delivery, or installation of any equipment will be withheld until the Engineer has received the required operation and maintenance manual(s).

END OF SECTION



SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described in Paragraph 3.1 below and, upon completion of the Work, submit the recorded changes as described in Paragraph 3.2 below.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Other requirements affecting Project Record Documents may appear in pertinent other Sections of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.
- F. The Engineer's approval of the current status of Project Record Documents may be a prerequisite to the Engineer's approval of requests for progress payment and request for final payment under the Contract.
- G. Prior to submitting each request for progress payment, secure the Engineer's approval of the current status of the Project Record Documents.
- H. Prior to submitting request for final payment, submit the final Project Record Documents to the Engineer and secure his approval.

1.3 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Engineer.

PROJECT RECORD DOCUMENTS

01 78 39-1 (120511.40)

- B. Accuracy of records:
  - 1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
  - 2. Accuracy of records shall be such that future search for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.
- C. Make entries within 24 hours after receipt of information that the change has occurred.
- D. Do not conceal any work until the required information is recorded.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Engineer's approval.
  - 1. Such means shall include, if necessary in the opinion of the Engineer, removal and replacement of concealing materials.
  - 2. In such case, provide replacements to the standards originally required by the Contract Documents.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

### PART 2 - PRODUCTS

#### 2.1 RECORD DOCUMENTS

- A. Job set: Promptly following receipt of the Owner's Notice to Proceed, secure from the Engineer at no charge to the Contractor one complete set of all Documents comprising the Contract.

### PART 3 - EXECUTION

#### 3.1 MAINTENANCE OF JOB SET

- A. Immediately upon receipt of the job set described in Paragraph 2.1 A. above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET".

- B. Preservation:
  - 1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set.
  - 2. Do not use the job set for any purpose except entry of new data and for review by the Engineer.
  - 3. Maintain the job set at the site of Work where designated by the Engineer.
- C. Making entries on Drawings:
  - 1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
  - 2. Date all entries.
  - 3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
  - 4. In the event of overlapping changes, use different colors for the overlapping changes.
- D. Make entries in the pertinent other Documents as approved by the Engineer.
- E. Conversion of schematic layouts:
  - 1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, is shown schematically and is not intended to portray precise physical layout.
    - a. Final physical arrangement is determined by the Contractor, subject to the Engineer's approval.
    - b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
  - 2. Show on the job set of Record Drawings, by dimension accurate to within one inch, the centerline of each run of items such as are described in Paragraph 3.1 E. 1. above.

### 3.2 REVIEW AND SUBMITTAL

- A. Submit the completed set of Project Record Documents to the Engineer as described in Paragraph 1.2 H. above.
- B. Participate in review meetings as required.
- C. Make required changes and promptly deliver the final Project Record Documents to the Engineer.

### 3.3 CHANGES SUBSEQUENT TO ACCEPTANCE

- A. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION



SECTION 01 91 58  
FACILITY STARTUP

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes the Contractor's general equipment requirements for facility start-up.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Divisions 01 31, 32 and 33 of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Submit a detailed plan and schedule for start-up of the facility at least thirty (30) days prior to the scheduled start-up of the facility.
- F. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 No products are required in this Section.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REQUIREMENTS

- A. Schedule a pre-start-up conference with the Contractor, Systems Integrator, Owner, and Engineer, at least two (2) months prior to scheduled start-up.
- B. Complete the following instrumentation, control and SCADA related items prior to each equipment, process startup and completion of Attachment 01 61 01-1:
  - 1. All instruments are installed and calibrated.
  - 2. Input/output point checks for all control panels are complete.
  - 3. Field/device level network cabling, configuration and testing is complete.
  - 4. PLC/computer network cabling, configuration and testing is complete.
  - 5. SCADA data register coordination between the Systems Integrator and manufacturer's representatives is complete.
  - 6. Alarm systems are operational.
    - a. Verify operators are receiving notification of alarms.
- C. Perform simulated power outage prior to the startup of each process and piece of equipment.
  - 1. Verify that equipment will restart automatically.
- D. Perform the facility start-up procedures in the presence of the Owner and Engineer.
- E. Operate the facility in coordination with Owner without problems for a period of fourteen (14) consecutive days prior to Owner's acceptance of the facility and setting the Substantial Completion date.
  - 1. The Substantial Completion date can be set on the fourteenth (14) consecutive day of operation without problems.

### 3.2 STEPS TO SUBSTANTIAL COMPLETION

- A. Schedule Pre-Start-up Conference with the Contractor, Systems Integrator, Owner, and Engineer (01 91 58 – 3.1A.).
- B. Submit detailed plan and schedule for start-up of the facility at least thirty (30) days prior to the scheduled start-up of the facility (01 91 58 – 1.2E.).
- C. Confirm that all shop drawing and O&M data has been submitted, approved, and final approved shop drawing and O&M data is available in hard copy on site and on Submittal Exchange.
- D. Completion of Mechanical, Electrical, Structural, and Integration per plans and project manual.
  - 1. Confirm that all mechanical, electrical, structural and integration components are complete.
  - 2. Coordinate the testing of the equipment with Owner and Engineer.



- E. Coordinate efforts of various equipment field service engineers with construction activities, including painting.
  - 1. Complete painting of pipe and equipment that will contain process water prior to filling pipe and equipment with process water.
- F. Complete the instrumentation, control and SCADA related items prior to each equipment and process startup (01 91 58 – 3.1B.).
- G. Complete Manufacturer's Certificate of Inspection (01 61 01-1):
  - 1. Manufacturer's representative certifies that equipment has been properly installed and satisfactorily tested and is now ready for normal operation and use.
  - 2. Submit a field service report from the field service technician within five (5) working days of each visit (01 61 01 – 3.2 C.).
- H. Complete Contractor's Verification of Equipment Inspection (01 61 01-2):
  - 1. Contractor verifies the equipment they have furnished and installed is now ready for normal operation and use by the Owner.
- I. Complete Manufacturer's training of the Owner in the operation and maintenance of the equipment in accordance with the manufacturer's recommendations (01 61 01 – 3.2 E.).
  - 1. Submit a field service report from the field service technician within five (5) working days of each visit (01 61 01 – 3.2 C.).
- J. Complete Contractor's Equipment Guarantee (01 61 01-3):
  - 1. Owner accepts responsibility for operation and maintenance of equipment at this time.
- K. Contractor, Owner and Engineer determine if Work is ready for 14 day operational test.
- L. Perform facility startup procedures in the presence of the Owner and Engineer (01 91 58 – 3.1D.).
- M. Complete 14 day operational test period successfully without problems (01 91 58 – 3.1E.).
  - 1. The Substantial Completion date can be set on the fourteen (14) consecutive day of operation without problems (01 91 58 – 3.1 E. 1.).
- N. Contractor notifies Owner and Engineer in writing that entire Work is substantially Complete (00 72 00 – 14.04 A.).
- O. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion.
  - 1. If Engineer considers the Work **not** substantially complete, Engineer notify Contractor in writing giving the reasons why the work is considered not substantially complete (00 72 00 – 14.04 B.).

2. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion (00 72 00 – 14.04 C.).
  - a. Engineer will provide Owner with tentative certificate and list of items to be completed or corrected before final payment (00 72 00 – 14.04 C.).
  - b. Owner will have 7 days to make written objection (00 72 00 – 14.04 C.).
  - c. Engineer will have 14 days after submission of the tentative certificate to the Owner, to execute definitive certificate of substantial completion or notify Contractor of the reasons why the Work is not considered substantially complete (00 72 00 – 14.04 C.).

END OF SECTION

SECTION 02 41 53

DEMOLITION, REMOVAL AND ABANDONMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes demolition and removal of structures and parts of structures, removal of above grade and underground improvements, and abandonment of underground structures and pipelines as shown on the Drawings and specified in this Section.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 DEFINITIONS

- A. Demolish – Raze and dispose of above grade structures; including, but not limited to walls, roofs, ceilings, and ground floor slabs and floors. Raze and dispose of all equipment, piping and plumbing, electrical and communications conduit, wires and cables, furniture, furnishings, windows, and doors in above grade and below grade structures.

DEMOLITION, REMOVAL AND ABANDONMENT

02 41 53-1 (120511.40)

- B. Remove – Excavate structure foundations, tanks, underground pipes, etc. in their entirety.
- C. Dispose – Transport or haul materials and equipment of any and all types to off-site location(s).
- D. Abandon – Remove structure foundations, tanks, and underground pipes, etc within the following limits
  - 1. 5 feet horizontally from any proposed structure or pipe, and
  - 2. 3 feet vertically below the proposed finished grade or the outside edges of any proposed structure or pipe.
- E. This work includes breaking up of below grade foundation slabs and sealing of underground pipes with mechanical plugs and/or concrete plugs.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Provide materials, not specifically described but required for proper completion of the work of this Section, as selected by the Contractor subject to the approval of the Engineer.
- B. Grout for filling of abandoned pipes and structures:
  - 1. Cellular grout:
    - a. Low density cellular concrete capable of being mixed on site and pumped into place through a 2-inch hose.
    - b. Foaming agent complying with ASTM C869.
    - c. Portland Cement: ASTM C150, Type I or Type II.
    - d. Contents: Cement, fly ash, water and foaming agent.
    - e. Minimum net density: 70 pounds per cubic foot.
    - f. Acceptable manufacturer:
      - (1) Mearl Geofoam Liquid Concentrate.
      - (2) Or equal.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 PROTECTION

- A. Protect existing utilities indicated or made known.

- B. Protect trees and shrubs, where indicated to remain, by plank wrappers securely wired in place or by providing a fence around the tree or shrub of sufficient distance away and of sufficient height so trees and shrubs will not be damaged in any way as part of this Work.
  - 1. Do not permit any equipment to operate within 5 feet of any trees or shrubs that are to remain or in a manner as to harm overhanging branches.
- C. Protection of persons and property:
  - 1. Barricade open depressions and holes occurring as part of this Work, and post warning lights on property adjacent to or with public access.
  - 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
  - 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by operations under this Section.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to the site at all times.

### 3.3 DEMOLITION

- A. General:
  - 1. By careful study of the Contract Documents and visiting the site, determine the location and extent of demolition to be performed.
  - 2. In all activities, comply with pertinent regulations of governmental agencies having jurisdiction.
- B. Demolition of existing structures:
  - 1. Demolish and remove existing structures, piping and equipment or parts thereof in a manner such as not to damage corresponding items which are to remain.
  - 2. In those areas in which structures or piping to be demolished and removed now occupy space to be used for proposed structures, remove the existing structure or piping in total unless other instructions are included on the Drawings.
- C. Existing equipment:
  - 1. Existing mechanical or electrical equipment, miscellaneous metals, pipe, fittings, valves, and other materials of whatever nature shall be disposed of.

### 3.4 ABANDONMENT OF STRUCTURES AND PIPING

- A. Structures:
  - 1. In those areas where structures do not now occupy space to be used for proposed structures, remove structures to a depth of not less than 3 feet below finished grade.

2. Break up or core hole slab portions of structures which may remain in part as specified above and fill voids with granular materials.
3. Plug piping which may remain in part as specified above with concrete for a distance of not less than 12 inches from the end of the pipe to remain in place.

### 3.5 DISPOSAL

- A. General:
  1. Dispose of all debris from demolition work.
  2. Dispose away from the site in a legal manner.
  3. Do not store or accumulate debris at the job site.
- B. Do not burn debris at the site.
- C. Prepare documentation identifying the hauler, generator, place of origin of debris or soil, the weight or volume of debris or soil, and the location, owner, and operator of the facility where debris or soil was transferred, disposed, recycled or treated. Maintain documentation for three years.

### 3.6 UTILITIES

- A. Coordinate with utility companies and agencies as required.
- B. Where utility cutting, capping, or plugging is required, pay utility company to do the work, or perform such work in accordance with requirements of the utility company or governmental agency having jurisdiction.

END OF SECTION

## SECTION 03 30 00

## CAST-IN-PLACE CONCRETE

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide cast-in-place concrete, including formwork and reinforcement, as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Prior to placing concrete on the project, submit the following to the Engineer for approval:
    - a. Testing laboratory reports for each proposed concrete mix, design proportions and sieve analysis, and soundness tests for fine and coarse aggregates.
    - b. Test results for strength, slump, and entrained air content in accordance with the latest requirements of ASTM C39 and ASTM C192 on trial mix or field-testing records completed within previous 24 months. Perform strength tests on two test cylinders after 7 days curing and on two cylinders after 28 days curing.
    - c. Evidence of compliance with ASTM specifications for materials proposed to be used in the concrete mix.
    - d. Detailed reinforcing bar fabrication drawings prepared in accordance with ACI 315 including location of bar splices proposed by the Contractor in addition to those shown on the Drawings.
  - 2. Submit, within 10 days of testing, duplicate copies of each laboratory report for concrete tests on samples taken at the jobsite, including the following information in each test report:
    - a. Project name.
    - b. Description of concrete work.
    - c. Quantity of concrete placed.
    - d. Dates of samples and testing.
    - e. Slump.
    - f. Total air content.
    - g. Compressive strength.
    - h. Air temperature at time of sampling.

## CAST-IN-PLACE CONCRETE

03 30 00-1 (120511.40)

3. Submit manufacturer's data to prove compliance with the specifications for the following products:
  - a. Non-shrink grout.
  - b. Waterstops.
  - c. Anchoring adhesive.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Lubricants – None Required.
- E. Spare Parts – None Required.
- F. Comply with pertinent provisions of Section 01 33 01.

### 1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with "Specifications for Structural Concrete for Buildings," ACI 301, except as may be modified herein.
- C. Provide access for, and cooperate with, the inspector and testing laboratory described in Section 01 45 29 of these Specifications.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.
- B. Provide proper storage for reinforcing steel at the project site, including protective covering and blocking to keep steel off the ground.

### 1.5 SITE CONDITIONS – Reserved.

### 1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 FORMS

- A. Use smooth, clean plywood or metal lined panels in good condition for forming exposed concrete surfaces including interior and exterior walls, beams, columns, and slabs. Coat the forms with a non-staining, non-reactive mineral oil.
- B. Provide 3/4-inch chamfers on exposed corners.



- C. When reusing lumber for formwork, remove nails, thoroughly clean, and fill and finish holes to produce smooth concrete surfaces free of defects.
- D. Provide temporary openings at the base of column and wall forms and elsewhere as required to facilitate cleaning and final inspection prior to concrete placement.
- E. Form Ties: Factory-fabricated steel snap-off or coil tie assemblies designed to resist the lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish tie assemblies that will leave no metal or other material except concrete within 1½ inches of the formed surface when forms, inserts and tie ends are removed.
  - 2. Furnish tie assemblies that provide cone-shaped depressions in the forms at the surface, at least 1-inch in diameter and 1½ inches deep, to allow filling and patching.
  - 3. Provide ties with integral steel or neoprene waterstop at midpoint for liquid containment structures, sludge storage structures, spill containment areas and below grade structures with accessible spaces.
  - 4. Do not use common wire for form ties.

## 2.2 REINFORCEMENT

- A. Comply with the following:
  - 1. Bars: Deformed billet steel conforming to ASTM A615, grade 60, unless otherwise shown on the Drawings.
  - 2. Tie wire: 16 gauge annealed steel wire.
- B. Fabricate reinforcement in accordance with the latest provisions of ACI 318 "Building Code Requirements for Structural Concrete".
- C. Shop fabricate bars by cold bending to the dimensions and shapes shown on the detail shop drawings unless otherwise shown on the Drawings or approved by the Engineer.
- D. Use bars that are free from paint, oil, dirt, scale, or excessive rust which will destroy or reduce the bond when embedded in concrete.

## 2.3 CONCRETE

- A. Comply with the following:
  - 1. Portland cement: ASTM C150, Type I or II.
  - 2. Aggregate, general:
    - a. ASTM C33, uniformly graded and clean;
    - b. 35 to 50 percent ratio of fine aggregate to total aggregate by weight of surface dry materials.
  - 3. Aggregate, coarse: Pass a 1.500-inch sieve.
  - 4. Aggregate, fine: Pass a 0.375-inch sieve.
  - 5. Water: Fresh, clean, and free of oils, acids, alkalies, organic matter and deleterious substances.

- B. Provide concrete with the following properties:
  - 1. Minimum 28-day compressive strength: 4,000 psi.
  - 2. Maximum water-cement ratio: 0.45 by weight.
  - 3. Minimum cement content: 520 pounds per cubic yard.
  - 4. Minimum slump: 1-inch.
  - 5. Maximum slump: 4 inches.
- C. Use air-entrained concrete except where a smooth steel trowel finish is required. Provide a total air content of 4 to 6 percent by volume.

## 2.4 GROUT

- A. Grout for non-structural fillets: One part Portland Cement, three parts fine aggregate, and sufficient water to obtain a consistency for easy placing and finishing.
- B. Non-shrink grout:
  - 1. Furnish pre-mixed, non-metallic, non-staining, non-corrosive, non-gas liberating, cement-based grout specifically recommended by the manufacturer for interior and exterior applications and complying with U.S. Corps of Engineers' Specification CRD C-621 and ASTM C1107.
  - 2. Acceptable products:
    - a. Multipurpose Grout, Dayton Superior Corporation.
    - b. Or equal.

## 2.5 CONCRETE ADMIXTURES

- A. Air-entraining admixtures: Conform to the latest requirements of ASTM C260.
- B. Water reducing admixtures:
  - 1. Conform to the latest requirements of ASTM C494.
  - 2. Type A (normal setting type) for all concrete.
  - 3. Type D (retarding setting type) or Type E (accelerating setting type) when approved by the Engineer.
- C. Fly ash admixtures (when approved by the Engineer):
  - 1. Maximum sulfur trioxide content: 5 percent.
  - 2. Maximum loss of ignition: 5 percent.
- D. Do not add calcium chloride, salts, or chemical antifreeze compounds to concrete.

## 2.6 ANCHORING ADHESIVE

- A. Provide a cartridge type, two-component, high solids acrylic-based adhesive system dispensed and mixed through a static mixing nozzle supplied by the manufacturer.
- B. Furnish material suitable for anchorage of reinforcing bars and threaded rods in cracked and uncracked concrete to resist long-term sustained loading, tested and qualified in accordance with the International Code Council Acceptance Criteria for Post-installed Adhesive Anchors in Concrete Elements (AC308).

- C. Acceptable products:
  1. Hilti Inc., HIT-HY 200.
  2. Simpson Strong-Tie, AT-XP.
  3. No substitution permitted.

## 2.7 OTHER MATERIALS

- A. Cement mortar: One part Portland Cement, 2½ parts fine aggregate, and sufficient water to obtain a maximum slump of 6 inches.
- B. Bonding grout: One part cement, one part fine aggregate, and sufficient water to obtain the consistency of thick cream.
- C. Patching mortar: One part cement, 2½ parts fine aggregate, and sufficient water to obtain a maximum slump of 1-inch.
- D. Waterstop: Polyvinyl chloride (PVC) waterstop extruded from an elastomeric plastic material of which the basic resin is prime virgin polyvinyl chloride not containing scrapped or reclaimed material.
  1. Type: 4-inch by 3/16-inch flat serrated with center bulb.
  2. Comply with U. S. Corps of Engineers Specification CRD C-572 and the following performance requirements:
    - a. Tensile Strength (ASTM D638): 2000 psi minimum.
    - b. Ultimate Elongation (ASTM D638): 350 percent minimum.
    - c. Tear Resistance (ASTM D624): 300 lb/in.
    - d. Hardness, Shore A (ASTM D 2240): 79 +3.
  3. Furnish factory made waterstop fabrications for all changes of direction, intersections, and transitions leaving only straight butt joint splices for the field.
  4. Provide hog rings or grommets spaced at 12 inches on center along length of waterstop.
  5. Acceptable products:
    - a. Greenstreak Group, Inc., Profile Style Number 702.
    - b. Or equal.
- E. Curing and sealing compound: Clear, non-yellowing, water-based, acrylic liquid membrane-forming curing and sealing compound complying with ASTM C1315, Type 1, Class A.
  1. Maximum VOC content: 50g/L.
  2. Acceptable products:
    - a. W. R. Meadows, VOCOMP-30.
    - b. Or equal.
- F. Dissipating curing compound: Water based, hydrocarbon resin liquid membrane-forming dissipating curing compound complying with ASTM C309, Type 1, Class B.
  1. Maximum VOC content: 100 g/L.
  2. Acceptable products:
    - a. W. R. Meadows, 1100-CLEAR.
    - b. Or equal.

- G. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FORMS

- A. Design, erect, support, brace, and maintain formwork to safely support vertical and lateral loads until such loads can be supported safely by the concrete structure.
- B. Assemble forms with tight flush joints securely clamped to prevent leakage of mortar. Brace forms to safely support concrete without deformation under load.
- C. Construct forms within the tolerance limits of permissible variations from lines, grades, and dimensions shown on the Drawings, in accordance with ACI 347 "Recommended Practice for Concrete Formwork".
- D. Construct forms to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.
- E. Notify the Engineer when formwork is complete so that a proper check may be made at least 24 hours prior to concrete placement.
- F. Carefully remove forms, ensuring complete protection of the structure.
- G. Remove forms for vertical sides of walls, beams, girders, columns, and other similar structural members 24 hours minimum after placement of concrete, provided the concrete has hardened sufficiently and will not be damaged.
- H. Do not remove forms and bracing for slabs, beams, girders, and similar structural members until the concrete structural members have attained sufficient strength to safely support their own weight and any construction or storage load.

### 3.3 REINFORCING

- A. Comply with the following, as well as the specified standards, for details and methods of reinforcing placement and supports.
  - 1. Clean reinforcement and remove loose dust and mill scale, earth, and other materials that reduce bond or destroy bond with concrete.

2. Accurately place and secure reinforcing steel within the tolerances required by ACI 318 using tie bars, chairs, bolsters, wire, clips or other devices approved by the Engineer.
3. Provide plastic protected bar supports for slab reinforcing.
4. Place bar supports for grade beams and slabs on bearing plates or blocks to prevent displacement into the earth subgrade.
5. Place reinforcement to obtain the following clear concrete coverage for protection, within tolerance limits specified in ACI 318 "Building Code Requirements for Structural Concrete":
  - a. Concrete cast against and permanently exposed to earth: 3 inches.
  - b. Concrete exposed to earth, liquid, weather, or bearing on work mat or slabs supporting earth.
    - (1) Slabs and joists: 2 inches.
    - (2) Walls: 2 inches.
    - (3) Footings and base slabs:
      - i. Formed surfaces: 2 inches.
      - ii. Top of footings and base slabs: 2 inches.
  - c. Other conditions:
    - (1) Slabs and joists:
      - i. No. 11 bars and smaller:  $\frac{3}{4}$ -inch.
      - ii. No. 14 and No. 18 bars:  $1\frac{1}{2}$  inches.
    - (2) Walls:
      - i. No. 11 bars and smaller:  $\frac{3}{4}$ -inch.
      - ii. No. 14 and No. 18 bars:  $1\frac{1}{2}$  inches.
6. Provide the following minimum clear distances between parallel reinforcing bars, between adjacent contact splices, and between a contact splice and an adjacent bar: 1-inch, one bar diameter, or 1.33 times the maximum size of coarse aggregate, whichever is larger.
7. Reinforcing bar splices:
  - a. Use contact lap splices securely tied to adjacent bars and installed with lap lengths shown on the Drawings.
  - b. Stagger splices in adjacent reinforcing bars unless otherwise shown on the drawings or specified:
    - (1) Beams and slabs: Splice bottom bars over supports and top bars at midspan.
  - c. Welded only where shown on the Drawings, conforming to the requirements of AWS D12.1.

#### 3.4 WATERSTOPS

- A. Install waterstop embedded in concrete and spanning construction, control and expansion joints to create a continuous diaphragm to prevent fluid migration for liquid containment structures, sludge storage structures, spill containment areas and below grade structures with accessible spaces.
- B. Waterstop:
  1. Install and splice waterstop in accordance with manufacturer's instructions.
  2. Install centered in joint unless otherwise shown on the Drawings.

3. Secure waterstop in place with hog rings or grommets spaced at 12 inches on center along the length of the waterstop and wire tie to adjacent reinforcing steel.
4. Install factory made waterstop fabrications at all intersections, transitions and changes of direction and limit field splicing to straight butt joints.
5. Heat fuse weld straight butt joint field splices with thermostatically controlled waterstop splicing iron.

### 3.5 EMBEDDED ITEMS

- A. Provide for the proper placement and support of fittings, inserts, fixtures, and sleeves to be built into the concrete work under other sections of the Specifications.
- B. Shop paint non-ferrous metal surfaces of embedded items as described in Section 05 50 00 of these Specifications.

### 3.6 MIXING CONCRETE

- A. Project site batched-mixed concrete:
  1. Mix in accordance with ACI 318, Chapter 5.8.1 and 5.8.3.
- B. Ready-mixed concrete:
  1. Pre-mix and transport to project site in accordance with ASTM C94.
  2. Record time of departure from the mixing plant and batch weights of cement and water on the delivery tickets.
  3. Water may be added to the ready-mixed concrete once after delivery, only if the maximum water cement ratio and slump will not be exceeded.
  4. Reject concrete not in place within 60 minutes after introducing water to the mix when transported in agitator trucks or within 30 minutes after introducing water to the mix when transported in nonagitator trucks.

### 3.7 PLACING CONCRETE

- A. Preparation:
  1. Remove hardened concrete and foreign material from conveying equipment.
  2. Remove foreign matter and excess water accumulated in forms.
  3. Rigidly close temporary openings left in formwork.
  4. Thoroughly sprinkle earth subgrades for structural slabs without vapor barrier protection to eliminate moisture absorption.
  5. Before depositing new concrete on or against concrete which has hardened:
    - a. Thoroughly clean hardened concrete and saturate with water.
    - b. Thoroughly cover hardened concrete surface with a 1/8-inch thick coating of neat cement mortar and place new concrete before the mortar has attained its initial set.
  6. Use only clean tools.
- B. Conveying:
  1. Convey concrete from the mixer to place of final deposit as rapidly as practical by methods which will prevent separation or loss of ingredients and assure the required quality of concrete.

2. Deposit concrete as nearly as practicable to its final location to avoid separation due to rehandling and flowing.
  3. Do not allow free fall of concrete to exceed 5 feet.
  4. Do not use concrete which becomes non-plastic and unworkable, or does not meet required quality control limits, or has been contaminated by foreign materials.
  5. Remove rejected concrete from job site.
- C. Placing concrete in forms:
1. Deposit concrete continuously or in layers so that no concrete will be placed on concrete which has hardened sufficiently to cause cold joints in the work.
  2. If necessary, add construction joints, approved by the Engineer.
  3. Remove temporary spreaders, screeds, etc. as they become unnecessary.
- D. Placing concrete slabs:
1. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until placing of a panel or section is completed.
  2. Bring slab surfaces to correct level with a straightedge, and then strike off.
  3. Use bullfloats or darbies to smooth the surface, leaving it free of bumps and hollows.
  4. Do not sprinkle water on plastic surface. Do not disturb slab surface prior to start of finishing operations.
  5. Place beams, girders, brackets, column capitals, haunches, and drop panels integrally with slabs.
- E. Do not begin placement of concrete in supported structural members until concrete previously placed in columns and walls is no longer plastic.

### 3.8 CONSOLIDATION

- A. General:
1. Consolidate each layer of concrete immediately after placing, by use of mechanical vibrators supplemented by hand spading, rodding, or tamping so that the concrete is thoroughly worked around reinforcement, embedded items, and into corners of the forms, eliminating all air or stone pockets which may cause honeycomb, pitting, or planes of weakness.
  2. Use mechanical vibrators with a minimum frequency of 7,000 revolutions per minute.
  3. Insert vibrator at points approximately 18 inches apart for approximately 5 to 15 seconds at each point, sufficient to consolidate concrete, but not to cause segregation.
  4. Do not overvibrate or use vibrators to transport concrete inside forms.
  5. Provide a spare vibrator and auxiliary power source at the site during placement operations.

### 3.9 JOINTS

- A. Construction joints:
1. Do not relocate construction joints shown on the Drawings or add construction joints, unless approved by the Engineer. Where additional construction joints are approved by the Engineer, provide waterstops consistent with design.
  2. Form construction joints perpendicular to main reinforcement and near quarter points of slabs, beams, and girders.
  3. Limit spacing of vertical construction joints to 40 feet in any one direction.
  4. Locate horizontal wall and column construction joints at the top of footings and grade slabs and the underside of slabs, beams, and girders.
  5. Continue reinforcing steel across construction joints as shown on the Drawings or as required by the Engineer.
  6. Form keyways in construction joints a minimum of 1½ inches deep and 3½ inches wide unless otherwise shown on the Drawings.
  7. Provide the following minimum bearing lengths on concrete walls and columns unless otherwise shown on the Drawings:
    - a. 2 inches for slabs.

### 3.10 CONCRETE FINISHING

- A. Finish concrete work to smooth, clean surfaces of uniform color with no roughness or imperfections.
- B. Remove roughness, projections, honeycomb, and other defects in formed concrete surfaces to sound concrete.
- C. Patch depressions and tie holes immediately after form removal.
1. Thoroughly wet areas to be patched to prevent absorption of water from patching mortar.
  2. Thoroughly brush bonding grout on areas to be patched.
  3. Consolidate patching mortar into place and strike off to leave a patch slightly higher than surrounding concrete surface to allow for initial shrinkage.
  4. Leave patch area undisturbed for at least one hour before final finishing.
  5. Prepared proprietary compounds for bonding grout and patching mortar may be used in lieu of or in addition to the above patching procedure, if approved by the Engineer.
- D. Unless otherwise shown on the Drawings, provide the following finishes at the indicated locations:
1. Float finish:
    - a. Monolithic slab surfaces that are to receive trowel finish and other slab finishes specified herein.
  2. Trowel finish:
    - a. Monolithic slab surfaces that are to be exposed to view, unless otherwise shown.
    - b. Slab surfaces of channels, tanks, reservoirs, basins, and chambers.



3. Non-slip broom finish:
  - a. Walks, stairs, drives, ramps, and similar pedestrian and vehicular areas.
  - b. Apply by dragging coarse bristle broom or burlap belt across concrete with uniform parallel overlapping strokes.
4. As-formed finish:
  - a. Surfaces adjacent to earth and more than 12 inches below finished grade level.
  - b. Other surfaces not exposed to view.
5. Smooth rubbed grout finish:
  - a. Exposed concrete surfaces including walls, beams, columns, and other vertical and inclined surfaces.
  - b. Undersides of walkways and slabs.
  - c. Tops and vertical or inclined surfaces of walls, inside tanks, reservoirs, basins, and chambers.
  - d. Surfaces adjacent to earth, stone, sand, or other special media to a depth of 12 inches below the required material grade line or low water level.
  - e. Apply finish to freshly hardened concrete as soon as possible after removal of forms.
  - f. Apply grout slurry, consisting of one part cement to 1½ parts fine aggregate mixed with water, uniformly over a predampened surface with clean burlap pads or with sponge-rubber or cork floats.
  - g. Rub grout surface with carborundum stone or similar abrasive to produce a uniform color and texture.
  - h. Remove excess grout with a dry burlap pad or a brush.

### 3.11 CONCRETE CURING

- A. Protect fresh concrete and grout surfaces from premature drying and excessively hot or cold temperatures.
- B. Cure fresh concrete and grout surfaces in a moist condition at a relatively constant temperature for at least 7 days after placement of Type I Portland Cement concrete, or longer if necessary for hydration and proper hardening of the concrete.
- C. Perform curing by one of the following methods:
  1. Ponding or continuous water spraying on concrete surface.
  2. Covering concrete surfaces with continuously wetted burlap, cotton, or other absorptive mats or fabric.
  3. Covering concrete surfaces with impervious waterproof paper or polyethylene film having 4-inch tape-sealed laps at common edges and taped-sealed and weighted perimeter.

4. Applying curing compound on concrete surfaces to which additional concrete will not be bonded in strict accordance with manufacturer's instructions:
  - a. For interior exposed horizontal floors, stairway landings and tread surfaces which will not receive floor covering or other coatings, apply two uniform coats of curing and sealing compound:
    - (1) Apply first coat when the surface water disappears and the concrete surface will not be marred by walking workers.
    - (2) Apply second coat at right angles to the first coat after the first coat has thoroughly dried.
  - b. For all other horizontal surfaces, apply uniform coat of dissipating curing compound when the surface water disappears and the concrete surface will not be marred by walking workers.
  - c. For vertical surfaces, apply uniform coat of dissipating curing compound promptly after removal of forms.
- D. Maintain temperature of fresh concrete between 50 degrees and 70 degrees F for the required curing period.
- E. Provide and erect necessary facilities for heating, covering, insulating, or housing the concrete work for cold weather protection.

### 3.12 CONCRETE TESTING

- A. Provide equipment and services required for sampling and testing concrete.
- B. Include the cost of testing in the total amount of the contract price for concrete work.
- C. Sample concrete in accordance with ASTM C172.
- D. Slump testing:
  1. Perform in accordance with ASTM C143.
  2. Perform one test minimum for each 50 cubic yards of concrete placed in one operation to check and maintain the required consistency of concrete.
  3. Perform whenever required by the Engineer.
- E. Air content testing:
  1. Perform concurrently with the taking of the concrete compression test cylinder specimens.
  2. Perform in accordance with one of the following methods:
    - a. ASTM C231 pressure method.
    - b. ASTM C173 volumetric method.
    - c. ASTM C138 gravimetric method.
- F. Compression testing:
  1. Make and cure compression test cylinder specimens in accordance with ASTM C31.
  2. Take one set of four (4) 6-inch x 12-inch cylinders or six (6) 4-inch x 8-inch cylinders for every concrete pour for structural slabs, walls, beams, girders, footings, and columns, and additional sets for each 100 cubic yards of concrete placed in one operation.

3. Take test cylinder specimens as directed by the Engineer to obtain representative samples of the concrete materials.
4. Cure the specimens on the job site under the same field conditions as the concrete work they represent for a minimum of 72 hours after sampling.
5. Test half of each set of concrete test cylinder specimens for compressive strength at 7 days and at 28 days in accordance with ASTM C39 (testing to be performed by an independent testing laboratory approved by the Engineer).
6. In any case where test results of concrete cylinder specimens fail to meet minimum compressive strength requirements, make additional tests in accordance with ASTM C42 or perform load tests in accordance with ACI 318, as required by the Engineer.
7. If these alternate strength tests show that concrete work does not meet minimum strength requirements, remove unsatisfactory concrete and reconstruct the work.

### 3.13 CUTTING AND PATCHING OF EXISTING CONCRETE

- A. Provide neat and smooth finished exposed surfaces.
- B. Provide 1-inch deep (minimum) saw cuts.
- C. Cut off exposed reinforcing bars a minimum of 1½-inch back of finished surface and fill remaining cavity with patching mortar.
- D. Provide straight and square lines at finished openings and ¾-inch chamfers at exposed corners.
- E. Core drill openings for new pipes and conduits and patch with non-shrink grout.
- F. Grind exposed finished surfaces flush to meet and match existing surfaces.

### 3.14 ANCHORING WITH ADHESIVE

- A. Drill holes, prepare surface, dispense and mix adhesive through a static mixing nozzle supplied by the manufacturer, and set reinforcement bars and threaded rod anchors in accordance with the manufacturer's recommendations where shown on the Drawings.
  1. Identify position of reinforcing steel and other embedded items prior to drilling holes. Do not cut or damage reinforcing steel, prestressed steel tendons, piping, conduits or other embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling.
  2. Use rotary impact hammer drills with carbide-tipped bits of diameters as specified by the adhesive manufacturer.
  3. Drill holes perpendicular to surface of concrete after has achieved full design strength.
  4. Clean holes to remove loose material and drilling dust prior to installation of adhesive.
  5. Follow manufacturer's recommendations to ensure proper mixing of adhesive components.

6. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
7. Inject sufficient adhesive in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.
8. Observe manufacturer's recommendations with respect to installation temperatures.

### 3.15 REMEDIAL WORK

- A. Repair or replace deficient work as directed by the Engineer and at no additional cost to the Owner.

END OF SECTION

SECTION 05 50 00  
METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide miscellaneous metal work as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE

- A. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.
  - 1. Structural Welding Code Steel: D1.1.
  - 2. Structural Welding Code Aluminum: D1.2.
  - 3. Structural Welding Code Sheet Steel: D1.3.
  - 4. Structural Welding Code Stainless Steel: D1.6.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

## 1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. In fabricating items which will be exposed to view, limit materials to those which are free from surface blemishes, pitting, rolled trade names, and roughness.
- B. Comply with pertinent provisions of the following standards, latest edition.
1. Aluminum castings: ASTM B26.
  2. Aluminum sheet and plate: ASTM B209, Alloy 6061-T6.
  3. Aluminum drawn seamless tubes: ASTM B210, Alloy 6063-T5.
  4. Aluminum extrusions: ASTM B221, Alloy 6063-T6.
  5. Aluminum seamless pipe: ASTM B241, Alloy 6061-T6.
  6. Aluminum forgings: ASTM B247, Alloy 6061-T6.
  7. Aluminum structural shapes: ASTM B308, Alloy 6061-T6.
  8. Aluminum structural pipe and tube: ASTM B429, 6061-T6.
  9. Aluminum tread plate: ASTM B632, Alloy 6061-T6.
  10. Steel W-shapes: ASTM A992.
  11. Steel M-shapes, S-shapes, C-shapes, MC shapes: ASTM A36.
  12. Steel rectangular and round hollow structural sections (HSS): ASTM A500, Grade B.
  13. Steel angles, plates, and bars: ASTM A36.
  14. Steel plates to be bent or cold-formed: ASTM A283, Grade C.
  15. Cold-finished steel bars: ASTM A108.
  16. Cold-rolled carbon steel sheets: ASTM A1008.
  17. Galvanized carbon steel sheets: ASTM A653, with G90 zinc coating.
  18. Stainless steel bars, angles and shapes: ASTM A276, Type 316 (Type 316L for welded connections).
  19. Welded stainless steel mechanical tubing: ASTM A554, Type 316 (Type 316L for welded connections).
  20. Stainless steel fasteners: ASTM F593 and F594, Type 316.
  21. Stainless steel wire fabric, sheet and plates: ASTM A240, Type 316 (Type 316L for welded connections).
  22. Gray iron castings: ASTM A48.
  23. Malleable iron castings: ASTM A47.
  24. Steel pipe: ASTM A53, Grade B, Schedule 40, black finish unless otherwise noted.
  25. Concrete inserts: Threaded or wedge type galvanized ferrous castings of malleable iron complying with ASTM A27.

### 2.2 ANCHORS AND FASTENERS

- A. Provide Type 316 stainless steel anchor bolts, threaded rods, bolts, nuts, screws, staples, washers, rivets, lock nuts, nails, pins, hooks, clamps, and all other metal fasteners.

- B. Post installed mechanical anchors:
1. Provide Type 316 stainless steel wedge, sleeve and drop-in expansion anchors of size and number required for the particular use.
  2. Furnish anchors suitable for installation in cracked and uncracked base materials to resist short and long-term sustained loading.
  3. Acceptable manufacturers:
    - a. Simpson Strong-Tie Company, Inc.
    - b. Hilti, Inc.
    - c. ITW Redhead.
    - d. Or equal.
- C. Post installed adhesive anchors:
1. Provide Type 316 stainless steel threaded rods set in place with a cartridge type, two-component, high solids adhesive system dispensed and mixed through a static mixing nozzle supplied by the manufacturer.
  2. Concrete base material: Furnish material suitable for anchorage of threaded rods in cracked and uncracked concrete to resist long-term sustained loading, tested and qualified in accordance with the International Code Council Acceptance Criteria for Post-installed Adhesive Anchors in Concrete Elements (AC308).
    - a. Acceptable products:
      - (1) Hilti Inc., HIT-HY 200.
      - (2) Simpson Strong-Tie, AT-XP.
      - (3) No substitution permitted.
  3. Solid grouted masonry base material: Furnish material suitable to resist long-term sustained loading, tested and qualified in accordance with the International Code Council Acceptance Criteria for Adhesive Anchors in Concrete and Masonry Elements (AC58).
    - a. Acceptable products:
      - (1) Hilti Inc., HIT-HY 70.
      - (2) Simpson Strong-Tie, ET HP.
      - (3) No substitution permitted.
  4. Hollow masonry base material: Furnish material suitable to resist long-term sustained loading, tested and qualified in accordance with the International Code Council Acceptance Criteria for Adhesive Anchors in Unreinforced Masonry Elements (AC60). Provide screen tubes for anchorage of threaded rods in hollow concrete masonry, hollow brick masonry and unreinforced masonry applications.
    - a. Acceptable products:
      - (1) Hilti Inc., HIT-HY 70.
      - (2) Simpson Strong-Tie, ET HP.
      - (3) No substitution permitted.
- D. Provide Type 304 stainless steel screw anchors of size and number required for the particular use.
1. Acceptable products:
    - a. Powers Fasteners, Tapper Screw Anchor.
    - b. Or equal.

## 2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

## 2.4 FABRICATION

- A. Except as otherwise shown on the Drawings or the approved Shop Drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.
- B. Fabricate with accurate angles and surfaces true to the required lines and levels, grinding exposed welds smooth and flush, forming exposed connections with hairline joints, and using concealed fasteners wherever possible.
- C. Prior to shop painting or priming, properly clean metal surfaces as required for the applied finish and for the proposed use of the item.
- D. On surfaces inaccessible after assembly or erection, apply two coats of the specified primer. Change color of second coat to distinguish it from the first.

## 2.5 ALUMINUM LADDERS AND STAIRS

- A. Fabricate of structural shapes in accordance with details shown on the Drawings.
  - 1. Provide stainless steel bolts, nuts, washers, and other fasteners.
  - 2. Stairway treads: Pressure locked rectangular bar type with corrugated nosing.
  - 3. Acceptable manufacturers:
    - a. Breuer Metal Craftsmen, Beaver Dam, WI.
    - b. Or equal.

## 2.6 SHOP TREATMENT OF METAL SURFACES

- A. Clean ferrous metal surfaces, except stainless steel and work to be galvanized, by sandblasting to bare metal in accordance with the Steel Structures Painting Council Specifications (SSPC) SP-10 and shop prime as specified under the Section 09 90 00.
  - 1. Do not shop prime or paint contact surfaces which are to be field bolted or welded.
- B. Clean cast or ductile iron surfaces by sandblasting to bare metal in accordance with SSPC SP-6 and shop paint with a two-coat system of bituminous paint using Tnemec 46-465 Heavy Duty Black, or equal.
- C. Clean stainless steel surfaces to remove oil, grease, hand and finger prints, and any other surface contaminants after fabrication and passivate in a 20 percent nitric acid solution.
  - 1. Protect polished stainless steel surfaces with removable plastic coatings or coverings during delivery, handling, and installation.



- D. Provide standard mill finish for aluminum surfaces unless clear anodized or color finish is otherwise specified.
  - 1. Provide caustic etch and anodic oxide treatment for aluminum surfaces to be anodized, conforming to the Aluminum Association Standard AA-M12C22A.
- E. Properly clean copper and bronze metal surfaces and shop coat with a high quality clear finishing lacquer.
- F. Shop paint non-ferrous metal surfaces which will contact dissimilar metals, mortar, concrete, plaster, or any other corrosive material with one heavy coat of bituminous paint, using Tnemec 46-465, or equal.

## 2.7 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

## 2.8 INSTALLATION

- A. General:
  - 1. Set work accurately into position, plumb, level, true, and free from rack.
  - 2. Anchor firmly into position.
  - 3. Where field welding is required, comply with AWS recommended procedures of manual-shielded metal-arc welding for appearance and quality of weld and for methods to be used in correcting welding work.
  - 4. Grind exposed welds smooth and touch-up shop prime coats.
  - 5. Do not cut, weld, or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connections.
  - 6. Immediately after erection, clean the field welds, bolted connections, and abraded areas of shop priming. Paint the exposed areas with same material used for shop priming.
- B. Post installed anchors:
  - 1. Perform anchor installation in accordance with manufacturer's instructions.
  - 2. Identify location of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not cut or damage reinforcing steel, prestressed steel tendons, piping, conduits or other embedded items. Notify the Engineer of reinforcing steel or other embedded items encountered during drilling.
  - 3. Use drill type, bit type and diameter recommended by the anchor manufacturer.
  - 4. Drill holes perpendicular to surface of concrete or masonry after concrete, mortar or grout has achieved full design strength.
  - 5. Clean holes to remove loose material and drilling dust prior to installation of anchors.

6. Mechanical anchors:
  - a. Protect threads from damage during anchor installation.
  - b. Use a torque wrench to set anchors to manufacturer's recommended torque.
7. Adhesive anchors:
  - a. Install screen tubes for anchorage of threaded rods in hollow masonry base materials.
  - b. Follow manufacturer's recommendations to ensure proper mixing of adhesive components.
  - c. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
  - d. Inject sufficient adhesive in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer's specified cure time has elapsed.
  - e. Observe manufacturer's recommendations with respect to installation temperatures.
8. Provide the following minimum embedment, edge distance and spacing unless indicated otherwise by the anchor manufacturer's instructions or shown otherwise on the Drawings:

Anchor Type	Min Embedment (Bolt Diameters)	Min Edge Distance (Bolt Diameters)	Min Spacing (Bolt Diameters)
Wedge	9	6	10
Sleeve	4	6	12
Drop-In	4	6	12
Adhesive	9	9	14

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide joint sealants as shown on the Drawings, as required by other Sections, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 – General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 DEFINITION

- A. The terms sealant and caulk shall be considered synonymous whenever and wherever used in Contract Documents.

## PART 2 - PRODUCTS

### 2.1 SEALANTS

- A. Type A – Silicone Sealant:
  - 1. Low modulus silicone sealant conforming to the latest requirements of ASTM C920, Type S, Grade NS, Class 100/50, Uses NT.
  - 2. Acceptable products:
    - a. Silpruf LM SCS2700, Momentive Performance Materials.
    - b. Dow Corning 790 Silicone Building Sealant, Dow Corning Corporation.
    - c. Or equal.
  - 3. Color as selected by Engineer.
  
- B. Type B – Acrylic Sealant:
  - 1. Acrylic latex plus silicone sealant conforming to the latest requirements of ASTM C834, Type OP, Grade NF single component, paintable.
  - 2. Acceptable products:
    - a. AC20+Silicone, Pecora Corporation.
    - b. DAP ALEX Plus Acrylic Latex Caulk Plus Silicone, DAP Products, Inc.
    - c. Or equal.
  
- C. Type C – Polyurethane Sealant (General Purpose):
  - 1. Polyurethane sealant conforming to the latest requirements of ASTM C920, Type S, Grade NS, Class 25, Uses NT, M, A, and O.
  - 2. Acceptable products:
    - a. DynaTrol I-XL, Pecora Corporation.
    - b. Sikaflex-1a, Sika Corporation.
    - c. MasterSeal NP1, BASF, The Chemical Company.
    - d. Or equal.
  
- D. Type D – Polyurethane Sealant (Continuous Water Immersion):
  - 1. Polyurethane sealant approved by manufacturer for continuous water immersion conforming to latest requirements of ASTM C920, Type S, Grade P or NS, Class 25, Uses I.
  - 2. Acceptable products:
    - a. Sikaflex-1a, Sika Corporation.
    - b. Sikaflex-1c SL, Sika Corporation.
    - c. Or equal.
  
- E. Primer: Non-staining type as recommended by sealant manufacturer.
  
- F. Joint Backing: Flexible, compressible, closed cell polyethylene compatible with sealant.
  
- G. Bond Breaker: Pressure sensitive tape as recommended by sealant manufacturer.

- H. Joint cleaner: Non-corrosive and non-staining type as recommend by sealant manufacturer and compatible with joint forming material.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify substrate surfaces and joint openings are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

### 3.2 INSTALLATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean and prime joints in accordance with sealant manufacturer's instructions.
- C. Protect elements surrounding the work from damage or disfigurement.
- D. Install in accordance with sealant manufacturer's instructions.
- E. Measure joint dimensions and size joint backers to achieve width to depth ratios, neck dimension, and surface bond area as recommended by sealant manufacturer.
- F. Install bond breaker where joint backing is not used.
- G. Install sealant free from air pockets, foreign embedded matter, ridges and sags.
- H. Tool joints.

### 3.3 CLEANING

- A. Clean adjacent soiled surfaces in accordance with sealant manufacturer's instructions.

### 3.4 SCHEDULE

- A. Contracting joints in concrete: Type C.
- B. Exposed joints between precast concrete roof deck units and precast concrete roof deck units and adjacent work: Type B.
- C. Interior and exterior joints between precast concrete roof deck units and adjacent work: Type A.

- D. Control joints in masonry, and between masonry and adjacent work: Type A, color as selected by Owner.
- E. Joints between interior and exterior frames of doors, windows, wall panels and other device set in masonry: Type A, color as selected by Owner.
- F. Exterior joints for which no other sealant type is indicated: Type C, color as selected by Owner.
- G. Interior joints for which no other sealant type is indicated: Type B, color as selected by Owner.
- H. Water immersion joints for which no other sealant type is indicated: Type D.

END OF SECTION

SECTION 08 31 23

FLOOR ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide floor access doors and frames as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Manufacturer's specifications and other data needed to assure compliance with specified requirements.
  - 2. Frame type, details of openings, and details of construction, installation, and anchorage.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 FLOOR ACCESS DOORS

- A. Provide floor access doors of the type, dimensions, and arrangements indicated on the Drawings, and with the following features:
1. Door leaf:
    - a. ¼-inch aluminum diamond pattern plate.
    - b. Reinforced for 300 pounds per square foot live load for interior areas of structures not subject to vehicle loading.
    - c. Reinforced for AASHTO HS20-44 truck load for exterior areas.
  2. Channel frame:
    - a. ¼-inch aluminum with anchor flange with a 1½-inch pipe coupling for channel frame drainage.
  3. Finish:
    - a. Provide mill finish for frame and door leaf surfaces.
    - b. Apply a protective alkali-resistant bituminous paint to the exterior frame surfaces contacting dissimilar metals, mortar, plastic, or concrete.
  4. Equip floor access doors with:
    - a. Forged aluminum hinges.
    - b. Stainless steel pins.
    - c. Tubular compression spring or heavy duty adjustable torsion spring operators.
    - d. Automatic hold-open arm with release handle.
    - e. Positive spring-loaded snap lock with fixed inside turn handle.
    - f. Removable outside key wrench for interior doors; outside padlock hasp for exterior doors.
  5. Acceptable manufacturers:
    - a. The Bilco Company.
    - b. Dur-Red Products.
    - c. Or equal.
- B. Provide caution sign on inside of wet well floor access doors as follows:
1. Sign color: Yellow with black letters.
  2. Sign size: Minimum size of 10 inches by 14 inches and letter size shall be at least 1-inch.
  3. Sign message:  
"CAUTION – DANGEROUS/HAZARDOUS GASES.  
CONFINED SPACE.  
DO NOT ENTER WITHOUT PROPER EQUIPMENT AND SUPERVISION."
  4. Aluminum (.080-inch thick) sign backing.
  5. Mount sign so it can be read by personnel before entering wet well once door is opened.
  6. Sign message material: Vinyl.



- C. Provide caution sign on inside of valve vault floor access doors as follows:
  - 1. Sign color: Yellow with black letters.
  - 2. Sign size: Minimum size of 10 inches by 14 inches and letter size shall be at least 1-inch.
  - 3. Sign message:  
"CAUTION – CONFINED SPACE.  
DO NOT ENTER WITHOUT PROPER EQUIPMENT AND SUPERVISION."
  - 4. Aluminum (0.80-inch thick) sign backing.
  - 5. Mount sign so it can be read by personnel before entering valve vault once door is opened.
  - 6. Sign message material: Vinyl.
  
- D. Provide hinged aluminum safety grates for all floor access doors to reduce risk of falling through openings with following characteristics:
  - 1. Grates to be safety orange in color.
  - 2. Rated to a minimum of 300 pounds per square foot.
  - 3. All stainless steel hardware.
  - 4. Stainless steel pneu-spring.
  - 5. System does not cause interference with pump guide rail system or pump removal.
  - 6. Acceptable products:
    - a. Aluminum Safety Grate System by Syracuse Castings.
    - b. Or approved equal.
  
- E. Provide an aluminum safety handhold post mounted to the ladder at locations shown on the Drawings.
  - 1. Telescoping design.
  - 2. Spring balanced to assist with raising/lowering.
  - 3. Automatic locking mechanism to hold post in raised position.
  - 4. Release lever to lower post.
  - 5. Adjustable mounting hardware.
  - 6. Acceptable products:
    - a. LadderUP Safety Post, Model LU-4 by The Bilco Company.
    - b. Or approved equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install in strict accordance with original design, Drawings, and manufacturer's recommended installation procedures.
  
- B. Anchor all components firmly in position.

END OF SECTION



SECTION 09 90 00  
PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Paint and finish exposed surfaces using the combination of materials listed on Painting Schedule in Part 3 of this Section, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
  - 2. Priming or priming and finishing of certain surfaces may be specified to be factory-performed or installer-performed under pertinent other Sections.
- C. References:
  - 1. Reserved.
- D. Work not included:
  - 1. Metal surfaces of submerged galvanized metal more than 12 inches below water surface, anodized aluminum, stainless steel, chromium plate, and similar finished materials will not require painting under this Section except as may be so specified in other Sections of these Specifications.
  - 2. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts, unless otherwise specified.
  - 3. Do not paint over required labels or equipment identification, performance rating, name, or nomenclature plates.
  - 4. Do not paint explosion-proof light fixtures, junction boxes, fittings or accessories.
- E. Definitions:
  - 1. "Paint" as used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Materials list of items proposed to be provided under this Section.
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Color charts for selection of colors by the Owner.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees:
  1. Contractor Qualifications - Provide certification of previous experience and equipment necessary to apply/install the specified painting and coating systems.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.

### 1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Paint coordination:
  1. Within 35 calendar days after the Contractor has received the Engineer's Notice to Proceed, arrange a conference with a technical representative of the paint manufacturer, the Engineer, the Contractor, and the Owner to:
    - a. Review the paint systems to be used;
    - b. Select colors;
    - c. Review painting procedures; and
    - d. Establish painting schedule.
  2. Notify the equipment manufacturers and miscellaneous metals fabricators of the correct shop primer to be used to assure compatibility of the total coating system.
  3. Review other Sections of these Specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system.
  4. Provide barrier coats over non-compatible primers, or remove the primer and reprime as required.
  5. Notify the Engineer in writing of anticipated problems in using the specified coating systems over prime-coatings supplied under other Sections.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.
  1. Store materials in a safe, ventilated location.
  2. Remove oily rags, waste, etc. every day and do not allow to accumulate under any circumstances.
  3. Take precautions to prevent spontaneous combustion.

## 1.5 SITE CONDITIONS

- A. Do not apply paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 50°F, unless otherwise permitted by the manufacturers' printed instructions as approved by the Engineer.
- B. Weather conditions:
  - 1. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces, unless otherwise permitted by the manufacturers' printed instructions as approved by the Engineer.
  - 2. Applications may be continued during inclement weather only within the temperature limits specified by the paint manufacturer as being suitable for use during application and drying periods.

## 1.6 MAINTENANCE

- A. Upon completion of the work of this Section, deliver to the Owner an extra stock equaling 10 percent, but not less than one gallon, of each color, type, and gloss of paint used in the Work, tightly sealing each container, and clearly labeling with contents and location where used.

## PART 2 - PRODUCTS

### 2.1 PAINT MATERIALS

- A. Acceptable materials:
  - 1. The Painting Schedule in Part 3 of this Section is based on products of The Sherwin-Williams Company, except where another manufacturer is named for a specific application.
  - 2. Products of other manufacturers may be submitted for review in accordance with provisions of the Contract. These products will be considered substitutions and will be reviewed in accordance with the requirements of Section 00 72 00, Article 6.05 and Section 01 62 01. Contractor is responsible for reimbursement of the Engineer's substitute products review costs to the Owner as described in Section 00 72 00, Article 6.05 E.
  - 3. Where products are proposed other than those specified by name and number in the Painting Schedule, provide submittal required by Article 1.2 of this Section and a new painting schedule compiled in the same format used for the Painting Schedule included in this Section.
- B. Undercoats:
  - 1. Provide undercoat paint produced by the same manufacturer as the finish coat.
  - 2. Insofar as practicable, use undercoat and finish coat material as parts of a unified system of paint finish.

- C. Provide all paints and materials supplied by one manufacturer.

## 2.2 APPLICATION EQUIPMENT

- A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the Engineer.
- B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

## 2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed.
  - 1. Correct conditions detrimental to timely and proper completion of the Work.
  - 2. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 MATERIALS PREPARATION

- A. General:
  - 1. Mix and prepare paint materials in strict accordance with the manufacturers' recommendations as approved by the Engineer.
  - 2. When materials are not in use, store in tightly covered containers.
  - 3. Maintain containers used in storage, mixing, and application of paint in a clean condition, free from foreign materials and residue.
- B. Stirring:
  - 1. Stir materials before application, producing a mixture of uniform density.
  - 2. Do not stir into the material any film which may form on the surface, but remove the film and, if necessary, strain the material before using.

### 3.3 SURFACE PREPARATION

- A. General:
  - 1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturers' recommendations as approved by the Engineer.

2. Remove removable items such as hardware, accessories, nameplates, fixtures which are in place and are not scheduled to receive paint finish; or provide surface applied protection prior to surface preparation and painting operations.
3. Following completion of painting in each space or area, reinstall the removed items by using workmen who are skilled in the necessary trades.
4. Clean each surface to be painted prior to applying paint or surface treatment.
5. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces and other surfaces.

B. Preparation of metal surfaces:

1. Thoroughly clean surfaces until free from dust, dirt, black oxide, scale, rust, paint, oil, and grease in accordance with The Society for Protective Coatings (SSPC) Specifications required in Paint Schedule.
2. On galvanized surfaces, prepare in accordance with methods outlined in ASTM D6386-99 Standard Practice for Preparation of Zinc (Hot Dipped Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.

C. Preparation of concrete surfaces:

1. Clean concrete surfaces by the methods outlined in SSPC SP-13, Surfaces Preparation of Concrete. Use wire brushing, scraping, high pressure water cleaning, mechanical abrasion, blast tracking, or sandblasting as necessary and as required on the Paint Schedule. Vacuum clean, air blast clean or water clean to remove dirt, dust and loose material. Steam clean or detergent clean to remove oils and grease, efflorescence, stains and contaminants.
2. Allow new concrete to cure a minimum of 28 days before paint application.
3. Level protrusions and mortar spatter.

D. Preparation of Ductile and Cast Iron Surfaces:

1. Solvent clean in accordance with NAPF 500-03-01 Surface Preparations Standard for Solvent Cleaning.
2. Abrasive Blast Cleaning of Ductile and Cast Iron:
  - a. For external pipe surfaces, abrasive blast clean in accordance with NAPF 500-03-04 Surface Preparations Standards for Abrasive Blast Cleaning – External Pipe Surfaces.
  - b. For internal pipe surfaces, abrasive blast clean in accordance with NAPF 500-03-04 Surface Preparations Standards for Abrasive Blast Cleaning – Internal Pipe Surfaces.

### 3.4 PAINT APPLICATION

A. General:

1. Touch-up shop-applied prime coats which have been damaged, and touch-up bare areas prior to start of finish coats application.

2. Notify the Engineer or the Owner of the completion of each coat.
    - a. Do not apply additional coats until the completed coat has been inspected and approved.
    - b. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
  3. Do all necessary touching up after other mechanics have finished and leave entire work in a neat and clean condition.
  4. Do not leave paint spots on glass, hardware, floors, or other finished work.
  5. If required by the Engineer, tint by mixing a small amount of white paint of the exact same type with any or all paint used prior to the final coat so that the area covered by the application of each coat is readily discernible.
  6. Provide an approved gauge for determining the mil thickness of the paint on a surface.
- B. Drying:
1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suit adverse weather conditions.
- C. Brush applications:
1. Apply the painting materials by brush and work the brush coats onto the surface in an even film.
  2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.
- D. Spray application:
1. Except as specifically otherwise approved by the Engineer, confine spray application to metal and similar surfaces where hand brushwork would be inferior.
  2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
  3. Do not double back with spray equipment to build up film thickness of two coats in one pass.
  4. Protect other surfaces from over spray.
- E. For completed work, match the approved texture, color, and coverage. Remove, refinish, or repaint work not in compliance with the specified requirements.

### 3.5 PAINTING SCHEDULE

Dry Film - mils

- A. Steel, iron, galvanized and non-ferrous metal; tanks, pipes, conduits, electrical boxes, and equipment:
1. Exterior, non-immersion: Sherwin-Williams Hi-Solids Polyurethane.
    - a. Surface preparation: SSPC-SP6 Commercial Blast Cleaning for ferrous



Dry Film - mils

- metal; ASTM D6386-99 for galvanized; scarify non-ferrous metal; NAPF 500-03 for cast & ductile iron.
  - b. 1<sup>st</sup> Coat: Sherwin-Williams Corathane I GalvaPac Zinc. 2.5 - 4.0
  - c. 2<sup>nd</sup> Coat: Sherwin-Williams Macropoxy 5500 Epoxy Coating. 4.0 - 6.0
  - d. 3<sup>rd</sup> Coat: Sherwin-Williams High Solids Gloss Polyurethane. 2.0 - 3.0  
8.5 - 13.0
2. Interior, non-immersion: Sherwin-Williams Macropoxy 5500 Epoxy Coating.
- a. Surface preparation: SSPC-SP6 Commercial Blast Cleaning for ferrous metal; ASTM D 6386-99 for galvanized; scarify non-ferrous metal; NAPF 500-03 for cast & ductile iron.
  - b. 1<sup>st</sup> Coat: Sherwin-Williams Corathane I GalvaPac Zinc. 2.5 - 4.0
  - c. 2<sup>nd</sup> Coat: Sherwin-Williams Macropoxy 5500 Epoxy Coating. 4.0 - 6.0
  - d. 3<sup>rd</sup> Coat: Sherwin-Williams Macropoxy 5500 Epoxy Coating. 4.0 - 6.0  
10.5 - 16.0
3. Severe wastewater environments, exposure to H<sub>2</sub>S, and Microbiological Induced Sherwin-Williams Duraplate 5900.
- a. Surface Preparation: SSPC-SP5 White Metal Blast Cleaning. A 3.0 mil profile is required.
  - b. 1<sup>st</sup> Coat: Sherwin-Williams Cor-Cote FRE. 15.0 – 20.0
  - c. 2<sup>nd</sup> Coat: Sherwin-Williams Cor-Cote FRE. 15.0 – 20.0  
30.0 – 40.0

3.6 PIPELINE IDENTIFICATION COLORS AND LABELS

- A. Paint pipelines including fittings and valves with the following color scheme:
  - 1. Natural Gas lines: 04SF Safety Orange
  - 2. Potable water lines: 11SF Safety Blue
  - 3. Sewage lines: 33GR Gray

END OF SECTION



SECTION 22 19 13  
PIPE AND PIPE FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide pipe and pipe fittings as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Provide labor, materials, tools, chemicals and equipment necessary to perform the pressure and leakage tests.
- C. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- D. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Perform shop and field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.
  - 1. Provide the services of an independent testing laboratory to take and test weld specimens or otherwise test welds to verify proper welding procedures as required by the Engineer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 DUCTILE IRON PIPE (DIP) AND FITTINGS

- A. Flanged joint pipe and fittings:
  - 1. Pipe: Comply with ANSI A21.51, thickness Class 53 with pipe flanges faced and drilled to ANSI Class 125 standard template unless otherwise designated on the Drawings.
  - 2. Fittings: Comply with ANSI A21.10 or ANSI B16.1.
  - 3. Flange gaskets: 1/16-inch thick sheet rubber, full face type or 1/8-inch thick Full Faced American Toruseal flange gasket.
  - 4. Flange bolts, studs, and nuts: Provide and install 316 stainless steel bolts, nuts and washers.
  - 5. Provide cement lining for all ductile iron pipes and pipe fittings complying with ANSI A21.4, standard thickness.
  
- B. Polyethylene sheet: Comply with ANSI/AWWA A 21.5-99/C105:
  - 1. Thickness: Linear low-density polyethylene film (minimum 8 mils) or High-density cross laminated polyethylene film (minimum 4 mils).
  - 2. Markings: The following information will be clearly marked on the sheet at minimum increments of 2 feet along its length:
    - a. Manufacturers name or trademark.
    - b. Year of manufacture.
    - c. Minimum film thickness and material type (LLDPE or HDCLPE).
    - d. Applicable range of nominal pipe diameter size(s).
    - e. Warning – Corrosion Protection – Repair Any Damage.

### 2.2 POLYVINYL CHLORIDE PIPE

- A. General:
  - 1. Provide polyvinyl chloride (PVC) pipe and fittings of Class 12454B material conforming to ASTM D1784.
  
- B. PVC pressure pipe and fittings:
  - 1. Use Schedule 80 with a minimum pressure rating of 125 psi at 73° F, conforming to ASTM D1785.
  - 2. Joints: Use solvent-weld socket type or threaded type.

### 2.3 POLYVINYL CHLORIDE PIPE – UNDERGROUND INSTALLATION

- A. General:
  - 1. Pipe material: Use Class 12454A or B polyvinyl chloride complying with ASTM D1784.
  
- B. PVC pressure (force main) pipe and fittings:
  - 1. Pipe 12-inch and smaller:
    - a. Comply with AWWA C900 for Class 235 pressure pipe with a standard dimension ratio of 18.

- b. Use push-on bell and spigot type joints with elastomeric ring conforming to ASTM F477.
  - 2. Fittings:
    - a. PVC plastic fittings: Provide restrained joint molded or fabricated pressure fittings complying with NSF 61, AWWA C900, and AWWA C907, with rubber gasket, push-on joints complying with ASTM D3139.
      - (1) Pressure class of fittings shall match pressure class of pipe.
      - (2) PVC material shall comply with ASTM D1784, with a cell classification matching the pipe.
      - (3) Material shall have a hydrostatic design basis of 4,000 psi.
      - (4) Gasket material shall comply with ASTM F477.
      - (5) Fittings shall be marked with size(s), material designations, standards, and manufacturer's name or trademark.
      - (6) Fabricated fittings shall be over-wrapped with fiberglass-reinforced mesh.
      - (7) Acceptable manufacturers of fittings:
        - i. Blue Brute (molded).
        - ii. IPEX Centurion (fabricated).
        - iii. Or equal.
  - 3. Provide restrained joint pipe and fittings for all force main piping and fittings:
    - a. Mechanical joint retainer gland systems that provide locking segments shaped to pipe barrel that do not create stress points on pipe barrel.
    - b. Acceptable products for pipes:
      - (1) Meg-A-Lug System (as examples).
        - i. Series 1500 Megalug Harness for push on joint (C900).
        - ii. As recommended by manufacturer for connection to existing pipes.
      - (2) Acceptable manufacturers of joint restraint for PVC fittings:
        - i. EBAA Iron Sales.
        - ii. Ford Meter Box Company.
        - iii. Tyler Union - TUFGRip.
        - iv. Clow (Canada).
        - v. Or equal.
- C. PVC plastic (gravity) sewer pipe:
- 1. For pipe 4-inch through 15-inch:
    - a. Comply with ASTM D3034 for Type PSM polyvinyl chloride (PVC) sewer pipe and fittings of minimum wall thickness SDR 26.
    - b. Joints: Use elastomeric gasket type complying with ASTM F477 and ASTM D3212.
    - c. Gaskets for fittings and joints: Provide minimum cross-sectional area of 0.20 square inches complying with ASTM F477.
  - 2. For pipe size of 16-inch:
    - a. Comply with AWWA C900 for Class 235 pressure pipe with a standard dimension ratio of 18.

- b. Use push-on bell and spigot type joints with elastomeric ring conforming to ASTM F477.

## 2.4 WALL PIPES, SLEEVES, AND SEALS

- A. Wall pipes:
  1. Use cast iron mechanical joint type with rubber gaskets and flanges tapped for studs, or ANSI Class 125 flange type with flanges tapped for studs.
- B. Wall sleeves:
  1. Cast iron wall sleeves: Use mechanical joint type with flanges tapped for studs.
  2. Steel wall sleeves: Fabricate sleeve from Schedule 40 black steel pipe.
- C. Link seals:
  1. Use modular mechanical type consisting of interlocking solid rubber links designed for positive hydrostatic pressure of 20 psig.
    - a. Connect each pair of links by a carbon steel zinc phosphate plated bolt and nut each with a heavy Delrin plastic elongated washer.
  2. Acceptable product: "LINK-SEAL" as manufactured by Thunderline Corp. and supplied by Maddock Mechanical Industries, Inc., Chicago, IL, or equal.
- D. Provide integral intermediate waterstop wall collars for all wall pipes and sleeves.

## 2.5 FLEXIBLE COUPLINGS AND FLANGED ADAPTERS

- A. Flexible couplings:
  1. Use slip ring sleeve type with rubber gaskets, tightening flanges and high strength bolts and nuts, Dresser Style 38, or equal.
  2. Provide two tie-rods for each coupling to secure the coupling to the adjacent pipe or fitting.
- B. Flanged adapters:
  1. Use steel fabricated type, Dresser Style 128, or equal.

## 2.6 RESTRAINED FLANGE ADAPTOR

- A. Provide a ductile iron flange adaptor dual ring system with bolt circles compatible with 125#/Class 150 bolt pattern.
  1. Provide adaptor with individual actuated gripping wedges that utilize torque limiting screws to insure proper initial set.
  2. Set screw "only" restraining adaptors are not acceptable.
  3. Provide system that allows joint deflection of up to 5°.
  4. Provide a fluoropolymer coating to the wedge and wedge assembly and powder coating to the restraint body.
- B. Acceptable manufacturers:
  1. Series 2100 Megaflange by EBAA Iron;
  2. Or approved equal.

## PART 3 - EXECUTION

### 3.1 FIELD MEASUREMENTS

- A. Make necessary measurements in the field to assure precise fit of items in accordance with the Drawings.

### 3.2 INSTALLATION OF PIPING

#### A. General:

1. Trench, backfill, and compact for the work of this Section in strict accordance with pertinent provisions of Section 31 23 79 of these Specifications.
2. Install pipe in accordance with pipe manufacturer's recommendations.
3. Install pipe by proceeding upgrade with the spigot ends of bell-and-spigot pipe pointing in direction of flow.
4. Use proper and suitable tools and appliances for safe and convenient handling and installation of piping.
5. Continually clear interior of the pipe free from foreign material.
6. Before making pipe joints, clean and dry all surfaces of the pipe to be joined.
7. Use lubricants recommended for the purpose by the pipe manufacturer.
8. Comply with ASTM D2321 for flexible thermoplastic sewer pipe installation.
9. Make adequate provision for expansion and contraction of piping.

#### B. Water and Sewer Main separation:

1. Whenever water mains are encountered in the course of piping installation, notify the Engineer to determine the construction necessary to comply with the provisions of Sections 31-1.02A of the "Standard Specifications for Water and Sewer Construction in Illinois".

#### C. Install unions or flanges at piping connections to each piece of equipment, at intervals of not more than 50 feet in straight runs of pipe, at each valve, and wherever else required to disassemble piping for service of fittings, fixtures, equipment and appurtenances.

1. Use unions in piping sizes 3 inches and smaller.
2. Use flanges in piping sizes larger than 3 inches.
3. Make connections between ferrous and non-ferrous metal piping with dielectric type insulated unions or flanges.

### 3.3 EXISTING PIPING

- A. The Drawings show the approximate location of existing piping as indicated by available existing records. The proposed work may require crossing, relocating, and in some cases connecting to the existing piping.

#### B. Expose carefully the existing piping throughout the area of proposed work.

1. All existing piping to remain undisturbed and in uninterrupted use until such time as a change is approved by Engineer.
2. Protect exposed piping from freezing during cold weather.

## PIPE AND PIPE FITTINGS

22 19 13-5 (120511.40)

- C. Where new piping is to cross or be connected to existing piping, make a field check to determine whether any conflict will be encountered in laying the new pipe.
1. Adjust the location of new piping, if necessary, as authorized by the Engineer, to avoid conflict with existing piping.
- D. Where new piping is to connect to existing piping, provide all fittings required to complete the connection, and do the work as expeditiously and carefully as possible.
- E. Remove and replace existing; or install new; pipe, fittings, valves and all appurtenances as required by the Drawings.
1. Adjust valve boxes as required to meet new finished grade elevations.
  2. Provide valve stems as required to place the operating nut 2 inches below the bottom of the valve box cover.
- F. If, in the opinion of the Engineer, it becomes necessary to alter the location of an existing pipe to accommodate construction of the new work; relocate or adjust the existing pipe as directed by the Engineer.
1. Additional compensation for this work will be paid for in accordance with the GENERAL CONDITIONS.

### 3.4 PIPING SUPPORTS

- A. General:
1. Design and provide complete system of supports and anchors for all piping, fittings, valves, fixtures and appurtenances.
  2. Absence of pipe supports and details on the Drawings shall not relieve the Contractor of responsibility for providing them.
  3. Design pipe support system to withstand dead loads imposed by weight of pipes filled with water with a minimum safety factor of 5.
  4. Paint pipe supports in accordance with Section 09 90 00.
- B. Types of support:
1. Piping adjacent to walls may be supported or braced by wall brackets.
  2. Floor pipe supports: Use adjustable with floor flanges, pipe stanchion, and saddle where they do not obstruct passage.
- C. Support spacing:
1. For rigid pipes except PVC pipes:
 

<u>Pipe Size</u>	<u>Maximum Spacing</u>
1/2" - 2"	6'
2-1/2" - 3-1/2"	8'
4" - 5"	8'
6" - 12"	9'
14" - 16"	9'
18" - 20"	9'
24" - 30"	9'



2. For PVC Schedule 80 pipes:

<u>Pipe Size</u>	<u>Maximum Spacing</u>
3/4" and smaller	continuous rigid support
1" - 1-1/2"	4'
2" - 2-1/2"	5'
3"	6'
4" and larger	7'

3. Provide a minimum of two pipe supports for each pipe run.

D. Thrust anchors and guides:

1. Provide thrust anchors and guides to resist thrust due to changes in pipe sizes or direction, or dead end of pipes.

### 3.5 PIPE RESTRAINING SYSTEMS FOR UNDERGROUND PRESSURE PIPING

A. General:

1. Provide protection from movement of pressure piping, plugs, caps, tees, valves, hydrants, and bends of 11¼ degrees or greater.
2. Provide restrained joint type fittings.
3. Where restrained joint type fittings are called for on the Drawings, but cannot be used, provide concrete thrust blocks.

B. Restrained type pipe and fittings:

1. Provide restraining system as outlined in Part 2 of this Section to prevent pipe and appurtenances from movement.
  - a. Protect all restrainers used for PVC fittings with a double layer of polyethylene wrapping or tubing.

C. Concrete thrust blocks:

1. Provide precast or cast-in-place concrete thrust blocking with a compressive strength of 3000 psi in 28 days.
2. Locate thrust blocking between solid ground and the fitting to be anchored.
3. Unless otherwise shown or directed by the Engineer, place the base and thrust bearing sides of thrust blocking directly against undisturbed earth.
4. Sides of thrust blocking not subject to thrust may be placed against forms.
5. Place thrust blocking so the fitting joints will be accessible for repair.
6. When conditions prevent the use of concrete thrust blocks, use tie rods or restrained joints of an approved type.

### 3.6 POLYETHYLENE WRAPPING OF APPURTENANCES

A. Comply with requirements of ANSI/AWWA C105/A21.5-99.

1. Place polyethylene sheet around the entire circumference of the pipe, tie or tape sheet securely to prevent displacement during backfilling.
2. Wrap all fittings, joint restraint harnesses and glands, valves, and valve boxes.

### 3.7 TESTING AND INSPECTING

- A. Hydrostatic tests:
1. Where any section of a pressure piping is provided with concrete thrust blocking, do not make hydrostatic tests until at least 5 days after installation of the concrete thrust blocking, unless otherwise directed by the Engineer.
  2. Devise a method for disposal of waste water from hydrostatic tests as approved in advance by the Engineer.
- B. Testing of pressure piping:
1. Subject the pressure piping to the following hydrostatic pressure:
    - a. Sewage and sump pump discharge piping with a normal operating pressure of 20 psig or greater: 125 psig.
  2. Hold the test pressure for a duration of 30 minutes without pressure loss or further pressure application.
  3. Replace or remake joints showing visible leakage.
  4. Remove cracked pipe, defective pipe, and cracked or defective joints, fittings, and valves.
    - a. Replace with sound material and repeat the test until results are satisfactory.
  5. Make repair and replacement without additional cost to the Owner.
  6. Do not test against existing valves.
- C. Deflection test for non-pressure flexible thermoplastic pipe:
1. Test the deflection of all installed PVC pipe.
  2. Perform the test no sooner than 30 days after backfilling has been completed.
  3. Perform the test by pulling a mandrel or rigid ball having a diameter equal to 95 percent of the inside diameter of the pipe through the pipe from manhole to manhole or manhole to structure without using mechanical pulling devices.
  4. Allowable deflection limits: 5.0 percent of the base inside diameter of the PVC pipe.
  5. Wherever the deflection limitation is exceeded, uncover the pipe, carefully replace compacted embedment and backfill material, and retest for deflection.
- D. Air testing of non-pressure piping:
1. Test all non-pressure piping for watertightness by the low pressure air testing.
  2. Low pressure air test:
    - a. Prior to testing for leakage, flush and clean the lines by passing a snug-fitting inflated rubber ball through the line by upstream water pressure.
    - b. Seal pipe openings with airtight plugs and braces.
    - c. Whenever the line to be tested is submerged under groundwater, insert a pipe probe by boring or jetting into the backfill material adjacent to the center of the line to determine the groundwater hydrostatic pressure by forcing air to flow slowly through the probe pipe.

- d. Add air to the plugged pipe sections under test until internal air pressure reaches 4.0 psig greater than any groundwater hydrostatic pressure.
  - e. Allow at least two minutes for air temperature to stabilize and adding air to maintain the initial test pressure.
  - f. Shut off the air supply after stabilizing the air temperature and record the time in seconds using an approved stopwatch for the internal pressure to drop from 3.5 psig to 2.5 psig greater than any groundwater hydrostatic pressure.
  - g. Allowable limits:
    - (1) For 16" sewer: Time to drop from 3.5 to 2.5 psig - 5 minutes, minimum.
    - (2) For 15" sewer: Test shall consist of televising for leaks (Connection to existing sewer prevents typical air testing).
  - h. If the air test fails to meet these requirements, or if televising indicates leaking joints; locate and repair, or remove and replace, the faulty sections of pipe in a manner approved by the Engineer, as necessary to meet the allowable limits upon retesting.
  - i. Do not use acrylamid gel sealant to correct leakage.
- 3. Provide and use measuring devices approved by the Engineer.
  - 4. Provide materials, and labor for making required tests.
  - 5. Make tests in the presence of the Engineer, giving the Engineer at least three days advance notice of being ready for test observation.

END OF SECTION



## SECTION 22 19 23

### VALVES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Provide valves as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 – General Requirements of these Specifications.
  - 2. Valves furnished as part of factory-fabricated equipment are specified as part of equipment assembly in other sections.
- C. References:
  - 1. Reserved.

##### 1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. General dimensions, construction details, and manufacturer's specifications.
- B. Operation and Maintenance Manuals – Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

##### 1.3 QUALITY ASSURANCE

- A. Provide valves of same type by same manufacturer to greatest extent possible.
- B. Provide valves with manufacturer's name and pressure rating clearly marked on valve body.
- C. Ensure all brass and bronze alloys contain less than 15 percent zinc, unless otherwise specified.

##### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 PLUG VALVES

#### A. General:

1. Provide non-lubricated eccentric action type plug valves designed for a minimum water working pressure of 150 psi.
2. Provide ASTM Standard A126 Class B cast iron bodies.
3. Provide resilient plug facings of Neoprene or Hycar.
4. Provide seats with a minimum 1/8-inch thick welded-in overlay of not less than 90 percent nickel content on all surfaces contacting the plug face on 3-inch size and larger valves.
5. Provide bolted bonnets on all valves and adjustable packing and packing glands or self-adjusting U-cups which are accessible without disassembly of the valve or actuator on 4-inch size and larger valves.
6. Open all plug valves by rotating operator counter-clockwise.
7. Provide rectangular port and plug design.

#### B. Provide valve pressure rating as follows and establish by hydrostatic test as specified by ANSI B16.1.

1. Drip-tight shutoff up to full pressure rating.
2. Drip-tight shutoff to full valve rating with pressure in either direction.
3. Pressures:
  - a. 175 psi for valves through 12-inch.
  - b. 150 psi for valves 14 through 54-inch.

#### C. Provide ANSI Class 125 standard flanged ends for valves installed in flanged piping.

#### D. Provide mechanical joint ends for valves installed in underground piping.

#### E. Unless otherwise shown on the Drawings, provide enclosed worm gear type actuator.

1. Equip gear actuators with adjustable stop to set closing torque with shaft and quadrant supported on permanently lubricated bronze bearings.
  - a. Provide 316 Stainless Steel bolts, nuts, and washers.
  - b. Rotate gear operator as required to prevent oil leakage.
2. Equip valves and gear actuators for underground installation with seals on all shafts and gaskets on the covers to prevent entry of water.
  - a. Provide totally enclosed actuator mounting brackets with gasket seals.
  - b. Provide stainless steel exposed nuts, bolts, springs, and washers on underground valves and actuators.

## VALVES

22 19 23-2 (120511.40)

3. Install a solid concrete block under gear operator and on compacted sub-grade and granular bedding material.
  - a. Concrete block shall provide support for valve box stabilizer.

- F. 20-inch size and smaller valves:
  1. Provide port area at least 80 percent of full pipe area.

- G. Acceptable manufacturers:
  1. DeZurik.
  2. Val Matic.
  3. Or equal.

## 2.2 CHECK VALVES

- A. General:
  1. Use swing check valves for wastewater pipelines.
- B. Swing check valves larger than 2 inches:
  1. Iron body, bronze mounted type with stainless steel hinge pins, rubber disc facing, ANSI Class 125 standard flange ends, and valve closure provided by one of these methods:
    - a. Disc accelerator with backflow actuator and disc position indicator.
  2. Minimum non-shock cold water pressure rating 150 psi.
- C. Acceptable manufacturers:
  1. Swing Check Valves:
    - a. Val-Matic Surgebuster.
    - b. Or equal.

## 2.3 PVC VALVES

- A. General:
  1. Manufacture PVC valves of Type 1, Grade 1 polyvinyl chloride thermoplastic conforming to the latest revised specification requirements of ASTM D1784.
  2. Provide socket type or threaded type valve ends.
- B. Ball valves:
  1. True union design with two-way blocking capability.
  2. One-piece capsule feature, or threaded in seal carrier, or other positive means to prevent over-tightening seating components.
  3. Teflon seat and Viton O-ring seals.
- C. Check valves:
  1. True union design ball check valves.
  2. Viton seat and O-ring seals.

- D. Acceptable manufacturers:
  - 1. Asahi/America.
  - 2. Hayward Manufacturing Co., Inc.
  - 3. Nibco.
  - 4. Or equal.

## 2.4 CORPORATION STOP

- A. Provide 1" ball valve corporation stops:
  - 1. Acceptable manufacturers and models:
    - a. Mueller 300 Ball Type – B-25009N for IPS Polyethylene pipe.
    - b. Or equal.

## 2.5 VALVE ACCESSORIES

- A. Provide adjustable valve boxes on buried valves:
  - 1. Valve box compatible with size and type of valve protected.
  - 2. Extend box to finished grade.
  - 3. Mark valve box cover "SEWER" for gravity sewer and force main piping valves.
  - 4. Bituminous coated carbon steel valve extension stems and 2-inch square operating nuts 2 inches below the bottom of the cover.
- B. Provide valve box stabilizer for all valve boxes.
  - 1. Valve box adaptors/stabilizers to be designed for use on side-mounted enclosed gear operators on the proposed plug valves.
  - 2. Acceptable manufacturers:
    - a. Adaptor, Inc.'s "Butterfly Valve Adaptor".
    - b. Or equal.
- C. Provide extension stems, stem guides, floor boxes, and other accessories as required.
  - 1. Fabricate exposed extension stems of stainless steel.
  - 2. Bronze bushing for floor boxes to maintain stem alignment.

## 2.6 PAINTING

- A. Comply with the pertinent provisions of Section 09 90 00.

## PART 3 - EXECUTION

- 3.1 Install valves in accordance with manufacturer's recommendations.

END OF SECTION



SECTION 22 19 26

GAUGES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide gauges as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. General dimensions and manufacturer's specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide gauges with ranges shown on the Drawings.

## 2.2 BOURDON TUBE TYPE PRESSURE GAUGES

- A. Provide phosphor bronze tube, brass socket, 4½-inch aluminum alloy case, white dial, and plastic glass lens.
  - 1. Provide ¼-inch gauge cock and stainless steel cartridge snubber.
- B. Provide ACCO Helicoid Type 410, or H.O. Trerice Company 500X, or equal.

## 2.3 INSTRUMENT PROTECTORS

- A. Provide instrument protectors for gauges where shown on the Drawings.
  - 1. Provide wafer ring type instrument protectors with carbon steel rings, Buna-N flexible cylinder and silicone oil sensing fluid.
    - a. Design to fit between ANSI Class 125 standard flanges of size shown on the Drawings.
  - 2. Provide Ronningen-Petter Iso-Ring, or Red Valve Company Series 48 Pressure Sensor, or equal.

## PART 3 - EXECUTION

- 3.1 Install gauges and accessories in accordance with manufacturer's recommendations.

END OF SECTION

## SECTION 26 05 19

## LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide low-voltage electrical power conductors and cables as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS – Reserved.

## 1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

## 1.5 SITE CONDITIONS – Reserved.

## 1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

## 2.1 GENERAL

- A. Comply with the following standards:
  - 1. UL 83 and ICEA S-61-402 for thermoplastic insulated wire and cable.
  - 2. UL 44, ICEA S-19-81 and ICEA S-66-524 for rubber or rubber-like and cross-linked thermosetting polyethylene insulated wire and cable.
- B. Provide copper wire only.
- C. No underground splices allowed unless approved by the Engineer.

## LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

26 05 19-1 (120511.40)

## 2.2 WIRE AND CABLE IN RACEWAY

- A. Power, light, and control conductors:
  - 1. Insulation: Rated for 600 volts.
    - a. Use dual rated type THHN/THWN in temperature controlled indoor locations.
    - b. Use Type XHHW in underground locations and unheated concrete structures.
  - 2. Use stranded wire for control conductors.
- B. Variable Frequency Drive (VFD) Multi-conductor cable:
  - 1. Conductor: 3C-7 strand copper conductors to ASTM B8.
  - 2. Insulation: 600V, flame retardant, cross-linked polyethylene (FR XLPE), 90 degrees C, wet/dry (UL44) XHHW-2.
  - 3. Grounding conductors: 3 stranded bare copper grounds symmetrically located in continuous contact with a copper tape shield.
  - 4. Shielding: Dual copper tape shields helically wound with 50% overlap.
  - 5. Assembly: 3 phase conductors with symmetrically located tri-sectional grounding conductors in continuous contact with a copper tape shield.
  - 6. Overall jacket: 90C-25C flame retardant yellow PVC LAG (Low Acid Gas) sunlight resistant.
  - 7. Temperature: 90 degree C wet/dry.
  - 8. Voltage class: 600 volts.
  - 9. Approvals: IEEE 383, 70,000 BTU flame test; UL 1277 and UL 1581; tray cable rated (TC).
  - 10. Manufacturer:
    - a. Anixter-Shawflex VFD Cable.
    - b. Belden VFD Cable.
    - c. Or equal.

## 2.3 JOINTS, TAPS, SPLICES, AND TERMINATIONS

- A. Conductors No. 10 AWG and smaller: Use twist type insulated wire nut solderless connectors.
- B. Conductors No. 8 AWG and larger: Use solderless compression type connectors of type that will not loosen under vibration or normal strains.
- C. Control and instrumentation conductors: Use crimp type spade connectors where control wires are connected to screw terminals of equipment.
- D. Joints, taps, and splices located in enclosures subject to moisture: Use watertight splice kits.

## 2.4 PERMANENT WIRE MARKERS

- A. Provide type-on, self-laminating vinyl, heat shrink polyolefin or nylon clip-sleeve, alpha-numeric, permanent wire markers.
  - 1. Use fine-line, black, permanent ink pens where field marking is necessary.
  - 2. Cloth tags are not acceptable.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install low-voltage electrical power conductors and cables in accordance with manufacturer's recommendations.
- B. Install wire and cable in conduit unless otherwise shown on the Drawings.
- C. Install warning tape along and above direct buried cable.
  - 1. Use red plastic, 6-inch wide tape.
  - 2. Imprinted "CAUTION - ELECTRIC CABLE BELOW".
  - 3. Bury approximately 1-foot below surface before final backfilling.
- D. Maintain barrier or conduit separation between power conductors and instrumentation conductors to avoid magnetic interaction where such conductors enter and pass through same manhole, handhole, casing pipe, box, or enclosure.
- E. Provide individual wiring compartments or barrier for separation between intrinsically safe and non-intrinsically safe conductors inside enclosures.

### 3.2 WIRE AND CABLE IDENTIFICATION

- A. Install permanent wire markers on wire and cable in junction boxes, pull boxes, wireways, and wiring gutters of panels. Markers to identify wire or cable number.
- B. Provide schedule identifying various power and lighting conductors from power source to equipment or device served.

### 3.3 FIXTURE OUTLETS

- A. Use minimum AWG No. 12 wire for conductors supplying power to single fixture.

END OF SECTION



## SECTION 26 05 26

## GROUNDING AND BONDING OF ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide grounding and bonding of electrical systems as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS – Reserved.

## 1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.
  - 3. Utility company providing electrical service.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

## 1.5 SITE CONDITIONS – Reserved.

## 1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

## 2.1 GENERAL

- A. Ground clamp fittings, connections, and joints:
  - 1. Provide interlocking listed clamp fabricated from high strength corrosion-resistant metal.
  - 2. Use high strength silicon bronze U-bolt, nuts, and lock washers.
  - 3. Use high strength cast bronze ground rod clamp listed for direct burial for ground rod.

## GROUNDING AND BONDING OF ELECTRICAL SYSTEMS

26 05 26-1 (120511.40)

- B. Ground rods:
  - 1. Provide copper or copper-clad steel core.
  - 2. Use 5/8-inch diameter minimum and 10-foot long.
- C. Ground wires:
  - 1. Use copper wire only.
  - 2. Size as shown on the Drawings.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Grounding electrode system:
  - 1. Attach ground wire to a point ahead of water meter or service shut-off valve, when available.
  - 2. Attach ground wire to building steel where available.
- B. Main and supplemental grounding electrode conductors:
  - 1. Install jumper or shunt around water meter and/or shut-off valve when applicable.
  - 2. Attach nonferrous metal tag at water pipe connection to warn against removal.
- C. Install properly terminated equipment grounding conductor in all flexible conduits.
- D. Drive ground rod to a depth that allows for physical protection and concealment below finished floor or grade. Leave approximately 4 inches of rod exposed for inspection prior to concealment.
- E. Make connections to ground rods with molded exothermic weld process, or a listed and approved ground rod clamp.

### 3.2 ELECTRIC MANHOLE AND HANDHOLE

- A. Drive ground rod at convenient point close to wall inside of structure.
- B. Connect ground rod to metal cable supports, groundable end bushings on conduits, non-PVC coated metal manhole steps, and cover frame with No. 4 AWG, stranded copper cable.
- C. Attach ground wire(s) neatly and firmly to walls.

### 3.3 FIELD QUALITY CONTROL

- A. Perform and record resistance-to-earth measurements witnessed by Engineer with all grounding electrode conductors.
  - 1. Isolate ground under test from other grounds.
  - 2. Measure in normally dry conditions not less than 48 hours after rainfall.



3. Measure at each ground rod and other ground connections when applicable.
- B. Maximum D.C. resistance allowable is 5 ohms.
  - C. Use the three-point method of measurement, unless specified otherwise.

END OF SECTION



## SECTION 26 05 29

## HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide hangers and supports for electrical systems as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS – Reserved.

## 1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

## 1.5 SITE CONDITIONS – Reserved.

## 1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

## 2.1 GENERAL

- A. Provide zinc galvanized, cadmium plated steel, or malleable iron supporting devices.
- B. Provide factory PVC-coated metal supports, clamps, and hardware when PVC-coated, galvanized rigid steel conduit is used.
  - 1. Comply with Section 26 05 33.
- C. Provide PVC supports, clamps and hardware for nonmetallic conduit system.

## HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

26 05 29-1 (120511.40)

- D. Provide drilled expansion insert type sleeve anchors, lag shields, or plastic anchors suitable for load and application.

## 2.2 LIGHTING FIXTURE SUPPORT

- A. Provide stems, hickies, bar hangers, clips, etc. as required to securely attach light fixtures to ceilings or walls.
- B. Provide auxiliary supports where required to allow fixtures to be drawn up tightly, tilted or rotated, and not be affected by vibrations.
- C. Provide fixture grid hangers for mounting surface fluorescent fixtures to exposed grid ceilings.
- D. Provide arms, supports or support clips as required for lay-in troffers in exposed grid ceilings.

## 2.3 SUPPORTING STRUCTURES

- A. Provide rack supports of stainless steel channels with adequate feet for secure mounting.

## 2.4 MOUNTING PANELS

- A. Provide adequately braced and sized equipment mounting panels where required to mount equipment.
- B. Paint surfaces of panel to comply with Section 09 90 00.

## 2.5 CONDUIT SUPPORTS

- A. Provide continuous or T-slot concrete insert channel.
- B. Provide one-hole or two-hole conduit straps as required.

## 2.6 TRANSFORMER MOUNTING BRACKETS

- A. Provide mounting brackets fabricated of galvanized steel channel section designed to support size of transformer.

# PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Determine if ceiling channel system is adequately supported to receive and support lighting fixtures.
  - 1. Where deemed inadequate, provide additional support to prevent ceiling from sagging.

### 3.2 INSTALLATION

- A. Install hangers and supports for electrical systems in accordance with manufacturer's recommendations.
- B. Do not use perforated hanger iron.
- C. Pass conduit through pitch pocket at roof line when extending conduit through roof.

END OF SECTION



## SECTION 26 05 33

## RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide raceway and boxes for electrical systems as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS – Reserved.

## 1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

## 1.5 SITE CONDITIONS – Reserved.

## 1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

## 2.1 GENERAL

- A. Provide conduit system of the types of conduit as indicated in the Conduit Usage Schedule in Part 3 of this Section.
- B. Provide junction boxes as necessary to facilitate pulling and/or splicing of wires.
- C. Provide factory PVC-coated boxes of same coating thickness as conduit system where PVC-coated conduit is used (except hazardous classified areas).

## RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

26 05 33-1 (120511.40)

- D. Provide PVC boxes where non-metallic conduit system is used.

## 2.2 METAL RACEWAY AND FITTINGS

- A. Galvanized rigid steel conduit (GRC) and fittings:
  - 1. Conduit: Comply with ANSI C80.1 and UL 6 standards.
  - 2. Fittings: Comply with UL 514B and NEMA FB1 & FB2.10 standards.
- B. Intermediate metal conduit (IMC) and fittings:
  - 1. Conduit: Comply with ANSI C80.6 and UL 1242 standards.
  - 2. Fittings: Comply with UL 514B and NEMA FB1 & FB2.10 standards.
- C. Electrical metallic tubing (EMT) and fittings:
  - 1. Conduit: Comply with ANSI C80.3 and UL 797 standards.
  - 2. Fittings: Comply with UL 514B and NEMA FB1 & FB2.10 standards.
- D. Polyvinyl-chloride (PVC) coated galvanized rigid steel conduit and fittings.
  - 1. Conduit: Comply with ANSI C80.1, UL 6, and NEMA RN1 standards.
    - a. Galvanized rigid steel conduit with full weight 40 mil thick PVC exterior coating.
    - b. PVC bonding to galvanized metal shall be stronger than plastic tensile strength.
    - c. Provide nominal 2 mil thick urethane, or equal, coating to inside of conduit.
  - 2. Fittings:
    - a. Comply with UL 514B and NEMA RM1 standards.
    - b. Threaded with full weight 40 mil thick PVC exterior coating.
    - c. Inside coating: Nominal 2 mil thick urethane, or equal.
    - d. Provide pressure sealing sleeves on all conduit openings.
  - 3. Accessories: Provide straps, clamps, and screws with full weight 40 mil thick PVC exterior coating.
  - 4. Provide factory-installed PVC coating on all components of PVC coated conduit system.
    - a. Use coating in field only for touch-up of components.
- E. Rigid aluminum conduit and fittings:
  - 1. Conduit: Comply with ANSI C80.5 and UL 6 standards.
  - 2. Fittings: Threaded, and in compliance with Comply with UL 514B and NEMA FB1 standards.

## 2.3 FLEXIBLE METAL RACEWAY AND FITTINGS

- A. Liquidtight, flexible metal conduit and fittings:
  - 1. Conduit: Comply with UL 360 standards.
    - a. Galvanized flexible steel core.
    - b. Provide outer liquidtight, PVC sunlight resistant jacket.
  - 2. Fittings: Comply with UL 514B and NEMA FB1 standards.



- B. Flexible metal conduit and fittings:
  1. Conduit: Comply with UL 1 standards.
  2. Fittings: Comply with UL 514B and NEMA FB1 standards.

## 2.4 NON-METALLIC RACEWAY AND FITTINGS

- A. Rigid conduit: Comply with ANSI C80.3, ASTM F512, NEMA TC-2 and UL 651 standards.
  1. Use heavy wall, sunlight resistant, PVC Schedule 40 or 80 as shown on the Drawings.
  2. Rated for use with 90 degree C. conductors.
- B. Liquid tight, flexible conduit: Comply with ANSI-79 and UL 1660 standards.
  1. Fittings: Liquid-tight.
- C. Fittings:
  1. Comply with UL 514C and NEMA TC3 standards.
  2. Schedule 40 or 80 to match conduit.

## 2.5 CONDUIT BODIES

- A. Metallic conduit bodies:
  1. Comply with ANSI C80.4 and C33.84, and UL 514 standards.
    - a. Use galvanized or cadmium plated malleable iron, or copper-free aluminum material.
    - b. Provide factory PVC-coated conduit bodies of same coating thickness as conduit where PVC-coated conduit is used.
- B. Non-metallic conduit bodies:
  1. Comply with ASTM F512 and UL 514 and 651 standards.
    - a. Compatible with Schedule 40 or 80 conduit.
    - b. UL listed for use.
- C. Provide removable cover with gasket and corrosion-resistant screws.

## 2.6 EXPANSION FITTINGS

- A. Expansion fittings: Comply with UL 514 standards.
  1. Provide copper grounding strap and clamps.
  2. Use Crouse-Hinds Type XJ, or equal.
- B. Expansion/deflection fitting:
  1. Comply with UL 514 and 467 standards.
  2. Use Crouse-Hinds Type XD, or equal.
- C. Provide factory PVC-coated fittings of same coating thickness as conduit where PVC-coated conduit is used.

- D. For non-metallic conduit system, use expansion fittings of material to match conduit installed.

## 2.7 DRAINS AND BREATHERS

- A. Automatic drain-breather: Use Crouse-Hinds Type ECD, or equal.
- B. Condensate drain: Use conduit outlet body, Type T.
  - 1. Provide threaded, galvanized plug with 3/16-inch drilled hole through plug.
- C. Provide factory PVC-coated fittings of same coating thickness as conduit where PVC-coated conduit is used.
- D. For non-metallic conduit system, use drains and breathers of material to match conduit system installed.

## 2.8 WALL AND FLOOR SLEEVES

- A. Comply with requirements of Section 22 19 13.

## 2.9 HAZARDOUS LOCATION SEALING FITTINGS

- A. Comply with UL 886 standard.
- B. Use malleable iron, zinc plated or copper-free aluminum fittings.
- C. Use O-Z/Gedney Type EY, EZS, EYD, EYDX or equal.
- D. Use O-Z/Gedney Type EYF fiber packing, or equal, to form dam inside fitting.
- E. Use O-Z/Gedney Type EYC sealing compound, or equal.

## 2.10 FLEXIBLE SEALING COMPOUND

- A. Use Panduit DS-5 duct sealing compound, or equal, where air and vaportight conduit sealing is required.

## 2.11 OUTLET BOXES AND JUNCTION BOXES

- A. Flush mounted: Provide galvanized steel boxes and accessories suitable for application and type construction.
- B. Surface mounted: Provide corrosion-resistant single or multiple gang malleable iron or aluminum Type FS or FD cast boxes with threaded hubs, or pressed steel boxes as permitted under Part 3 of this Section.
- C. Weatherproof boxes: Provide gasketed covers and corrosion-proof fasteners.

## 2.12 PULL BOXES AND SPECIAL PURPOSE OUTLET BOXES

- A. Provide pull boxes with covers held in place by corrosion-resistant machine screws, and of type or NEMA rating as shown on the Drawings.
- B. Provide special purpose outlet boxes furnished with fixtures and devices where standard outlets are not applicable.

## 2.13 HAZARDOUS LOCATION JUNCTION BOXES AND PULL BOXES

- A. Comply with UL 886 standard.
- B. Provide surface mounted, corrosion-resistant, malleable iron or aluminum boxes properly sized for wire fill, listed for Class I, Division 1, Group D locations, and suitable for wet locations where required and shown on Drawings with (XP) symbol.

## PART 3 - EXECUTION

### 3.1 INSTALLATION - RACEWAY

- A. Install raceway and boxes for electrical systems in accordance with manufacturer's recommendations.
- B. Run exposed conduits parallel to or at right angles with lines of building or structure.
- C. Route conduit runs above suspended panel ceilings so as not to interfere with panel removals.
- D. Keep conduit plugged, clean and dry during construction.
- E. Install wall sleeves as shown on the Drawings where conduits pass through foundation walls below grade.
- F. Install expansion fittings in the following locations:
  - 1. Conduit runs crossing structural expansion joint.
  - 2. Conduit runs attached to two separate structures.
  - 3. Conduit runs where movement perpendicular to axis of conduit may be encountered.
- G. Conduit runs extending through areas of different temperature or atmospheric conditions, or partly indoors and partly outdoors must be sealed, drained, and installed in a manner preventing drainage of condensed or entrapped moisture into cabinets, boxes, fixtures, motors, or equipment enclosures.

- H. For conduits that are installed in the top of cabinets, junction boxes, pull boxes, fixtures, motors, or equipment enclosures: position the conduit openings so any moisture/condensation from the conduit, cables and conductors does not fall on to any electrical components within. Do not install openings directly above electrical equipment in any cabinet, junction box, pull box, fixture, motor, or equipment enclosure.
- I. Conduits run in concrete structures:
  - 1. Comply with applicable provisions of ACI 318 for conduits embedded in structural frame slab.
  - 2. Install conduits parallel to each other spaced on center of at least three times conduit trade diameter with minimum 2-inch concrete covering.
  - 3. Conduits over 1½ inches may not be installed in slab without approval of Engineer.
- J. Install bushings with ground lugs and integral plastic linings at equipment with open-bottom conduit entrances.
- K. In precast areas, run conduits in roof insulation space. Use 3/4-inch maximum conduit size.
- L. Exterior underground conduit:
  - 1. Comply with pertinent provisions of Section 31 23 79.
  - 2. Provide conduits or ducts terminating below grade with means to prevent entry of dirt or moisture.

### 3.2 INSTALLATION – BOXES

- A. Install boxes in accordance with manufacturer's recommendations.
- B. Use weatherproof boxes for interior and exterior locations exposed to weather or moisture.
- C. Do not install boxes back to back or through wall. Off set outlet boxes on opposite sides of wall minimum 12 inches.
- D. Set outlet boxes parallel to construction.
- E. Thoroughly clean boxes prior to installing wiring devices.

### 3.3 CUTTING AND PATCHING

- A. Make provisions for openings, holes, and clearances through walls, floors, ceilings, and partitions in advance of construction.
- B. Cut and patch in accordance with Section 01 73 29.
- C. Core drill through reinforced concrete with approval of Engineer.

### 3.4 RESTRICTIONS

- A. Cross high temperature piping or ducts with 12-inch clearance.
- B. Do not route conduit over boiler, incinerator, or other high temperature equipment, piping, or ducts.
- C. Do not route exposed conduit below and parallel to, or adjacent to water piping.
- D. Do not use EMT indenter-type fittings on EMT conduit.

### 3.5 EXISTING CONDUIT

- A. The Drawings show the approximate location of existing conduit as indicated by available existing records. The proposed work may require crossing, relocating, and, in some cases, connecting to the existing conduits.
- B. Expose carefully the existing conduits throughout the area of proposed work.
  - 1. All existing conduits to remain undisturbed and in uninterrupted use until such time as a change is approved by the Engineer.
- C. Where the conduits are to cross or be connected to existing conduit, make a field check to determine whether any conflict will be encountered in laying the new conduit.
  - 1. Adjust the location of new conduits, if necessary, as authorized by the Engineer, to avoid conflict with existing conduits.
- D. Where new conduits are to connect to existing conduits, provide all fittings required to complete the connection, and do the work as expeditiously and carefully as possible.
  - 1. Inspect and clean existing conduit prior to installing new wire.
- E. Remove and replace existing conduits, fittings, boxes, and all appurtenances as shown on the Drawings.
  - 1. Do not remove and replace existing items shown to remain unless approved by the Engineer.

### 3.6 CONDUIT USAGE SCHEDULE

- A. Install GRC when in contact with earth or fill unless otherwise shown on the Drawings.
- B. Install GRC or IMC in the following locations unless otherwise shown on the Drawings:
  - 1. Concealed in poured concrete walls and floor or roof slabs.
  - 2. Concealed in insulation above poured or precast concrete roof slabs.
  - 3. Exposed.

- C. EMT conduit may be installed in the following locations unless otherwise shown on the Drawings:
  - 1. Above suspended ceilings.
  - 2. In attic spaces.
  - 3. Concealed in walls, hollow metal or wood framed floors, ceilings, soffits, and overhangs.
  - 4. Concealed by counter base cabinets.
  - 5. Inside exterior electrical enclosures.
- D. Install liquidtight flexible metal conduit and fittings for connections to motors, instrumentation, and equipment subject to vibration and at locations shown on the Drawings.
- E. Install PVC coated galvanized rigid steel conduit, rigid aluminum conduit, and rigid non-metallic conduit only when shown on the Drawings.

### 3.7 EXPOSED OUTLET AND JUNCTION BOXES

- A. Use cast boxes up to 45 inches above floor.
- B. Pressed steel boxes acceptable over 45 inches above floor in dry, indoor locations.
- C. Install weatherproof outlet, switch, and junction boxes outdoors and in any area where Drawings show weatherproof (WP) wiring devices.

### 3.8 OUTLET BOX ACCESSORIES

- A. Provide outlet box accessories and mounting devices as required for each installation.

### 3.9 LIGHTING FIXTURE OUTLET BOXES

- A. Securely mount with approved type bar hangers spanning structural members to support weight of fixture.

### 3.10 OUTLET BOX LOCATIONS

- A. Location of outlets and equipment is approximate. Exact location to be verified and determined by:
  - 1. Conflict with equipment of other trades.
  - 2. Equipment manufacturer's drawings.
  - 3. Engineer in field.
- B. Minor modification in location of outlets and equipment is considered incidental up to distance of 10 feet with no additional compensation, providing necessary instructions are given prior to roughing-in of outlet boxes and equipment.

- C. Nominal mounting heights for devices and equipment to be measured from either above finished floor (AFF) or above finished grade (AFG) to center line of device and, unless otherwise shown on the Drawings, are as follows:
1. Switches: 48 inches AFF OR AFG.
  2. AC receptacles and telephone outlets: 48 inches AFF or AFG.
  3. Thermostats: 60 inches above floor.

END OF SECTION





## SECTION 26 05 53

## IDENTIFICATION FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide identification for electrical systems as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE – Reserved.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

## 2.1 NAMEPLATES AND TAGS

- A. Provide nameplates or tags for identification of panels, panel components, and field mounted devices with the following requirements.
  - 1. Engraved laminated plastic.
  - 2. White or black letters on background of opposite color. Match and coordinate color of nameplate or tag background with other panels.
- B. Panel nameplates to have 1/2-inch high letter engraving.
- C. Device and component nameplates or tags to have 3/16-inch high letter engraving.

- D. Engravings include the following:
  1. Alpha-numeric number.
  2. Descriptive title.
  3. Range, where applicable.
  4. Engineering units, where applicable.

## 2.2 ARC FLASH INCIDENT ENERGY STUDY AND ARC FLASH WARNING LABELS

- A. An Arc Flash incident energy study shall be done in accordance with the IEEE 1584, "IEEE Guide for Performing Arc Flash Hazard Calculations" for the following per NEC Article 110.16: Switchboards, Switchgear, Panelboards, Industrial Control Panels (3-Phase), Meter Socket Enclosures, and Motor Control Centers.
- B. Based on the results of the incident energy study, install Personal Protective Equipment (PPE) warning labels for each piece of equipment as specified above, in accordance with ANSI Z535.4.
  1. The label shall include the following information:
    - a. PPE category.
    - b. Equipment name.
    - c. Limited, restricted, and prohibited Approach/Flash Hazard Boundaries (inches).
    - d. Arc Flash Incident energy value (cal/cm<sup>2</sup>) and working distance (inches).
    - e. Voltage rating of equipment.
    - f. Upstream protective device.
    - g. Study report issue date.

## 2.3 AVAILABLE FAULT CURRENT AND SERVICE ENTRANCE LABELS

- A. Label service equipment with maximum available fault current per NEC article 110.24 (A).
- B. The contractor is responsible for obtaining the Available Fault Current from the power company.

## 2.4 ELECTRICAL COORDINATION STUDY

- A. Coordination Study in accordance with IEEE 242 "Buff" to determine the proper overcurrent device settings that will balance system reliability through selective coordination while minimizing the magnitude of an electrical arc flash hazard incident.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install nameplates and tags on enclosures, panel mounted components, and field mounted devices.

END OF SECTION

SECTION 26 09 95

PUSHBUTTONS, SELECTOR SWITCHES, AND PILOT LIGHTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide pushbuttons, selector switches, and pilot lights as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts:
  - 1. Two (2) pilot light lamps of each type.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70, National Electrical Code (NEC).
  - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Provide oil-tight, heavy duty NEMA 4 rated pushbutton switches, selector switches, and pilot lights.
- B. Provide all devices with legend plates.
  - 1. Material: Non-tarnish metal or laminated plastic.
  - 2. Use white or black letters on background of opposite color for laminated plastic.
- C. Use two-circuit contact blocks (one N.O. and one N.C. contact set) for pushbutton switches and selector switches.

### 2.2 PUSHBUTTON SWITCHES

- A. Stop pushbuttons:
  - 1. Provide non-illuminated momentary operation type operators.
  - 2. Use red color button.
- B. Start pushbuttons:
  - 1. Provide non-illuminated momentary operation type operators.
  - 2. Use black color button.
- C. Stop-hold switches:
  - 1. Use stop pushbutton as specified above.
  - 2. Include sliding latch with padlock provision to engage stop button in the OFF position.
- D. Provide pushbuttons for other functions as shown on the Drawings.

### 2.3 SELECTOR SWITCHES

- A. Provide selector switches including the operating knob, operating cam and contact block(s).
- B. Use black color operating knob.
- C. Select operating cam and contact block combination to provide operating sequence as required.

### 2.4 PILOT LIGHTS

- A. Provide pilot lights with colored plastic lens as shown on the Drawings.
- B. Provide 120 volt or 24 Vdc, push-to-test type with LED lamp.

## 2.5 ENCLOSURES

- A. Provide for individual remote control or monitor stations the following type enclosure:
  - 1. Indoor locations: NEMA 1.
  - 2. Outdoor or wet locations: NEMA 3R or NEMA 4 steel construction.
  - 3. Corrosive locations: NEMA 4X stainless steel construction.
  - 4. Hazardous locations: NEMA 7/9 cast iron, or copper free cast aluminum alloy.
  
- B. Provide nameplate on enclosure for device being controlled.
  - 1. Provide engraved laminated plastic type.
  - 2. Use 3/16-inch high white or black letters on background of opposite color.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install pushbutton switches, selector switches, and pilot lights in accordance with manufacturer's recommendations.

END OF SECTION



SECTION 26 09 96

ELECTRICAL SYSTEMS CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide electrical systems control devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70, National Electrical Code (NEC).
  - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

ELECTRICAL SYSTEMS CONTROL DEVICES

26 09 96-1 (120511.40)

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Provide suitable mounting brackets in conformance with manufacturer's recommendation for each control device required.

### 2.2 LIMIT SWITCHES

- A. Provide heavy duty, precision, oiltight limit switch as follows:
  - 1. Die-cast zinc enclosure meeting NEMA 2, 4, or 13 requirements.
  - 2. Snap action, single pole, double throw contacts.
  - 3. Contacts rated to carry 10 amperes continuous load at 120 volt AC.
  - 4. Include adjustable, side roller arm type, spring return, turret head actuators.
- B. Acceptable manufacturer:
  - 1. Square D Company, Class 9007, Type C.
  - 2. Or equal.

### 2.3 KEY ENTRANCE SWITCH

- A. Provide heavy-duty, security station type key-operated selector switch suitable for use in intrusion alarm circuits.
- B. Provide single pole single throw (DPDT) contacts rated for a minimum of 6 amperes at 120 volts AC/DC.
- C. Provide four (4) keys to match existing key system when required by Owner.
- D. Provide switch so that keys are removable in either position.
- E. Provide switch with weatherproof cover plate and tamper-proof screws, switch unit, neoprene gaskets, and seals.

### 2.4 FLOAT SWITCHES

- A. Provide level sensing float switches with following requirements:
  - 1. Float casing material: Polypropylene.
  - 2. Float Filling:
    - a. Conery 2900-B8: Solid polyurethane foam.
    - b. Anchor Scientific ECO-FLOAT: Air.
  - 3. Switch:
    - a. Non-mercury, mechanical switch in float casing.
    - b. Normally open (normally closed) (SPDT).
    - c. Switch Rating: Minimum 10-amp contacts, 120 VAC.



4. Cable:
  - a. Jacket: Chlorinated Polyethylene (CPE).
  - b. Conductors:
    - (1) 18 gauge or larger diameter.
    - (2) Two SJOOW-300 Volt
5. Actuation Point: Maximum angle of 45 degree above, 45 degree below horizontal.
6. Approval: UL listed.
7. Mounting:
  - a. Suspended on externally weighted cable or chain.
    - (1) Stainless steel cable or chain with 10-pound cast iron weight for float switch support, or
    - (2) Cord weight (zinc plated cast iron – 1.22 lbs).
8. Acceptable manufacturer:
  - a. Conery Mfg Inc., Model 2900-B8 Green Bulb.
  - b. Anchor Scientific ECO-FLOAT Type GSE.
  - c. Or equal.

## 2.5 MOTOR PROTECTORS

- A. Provide 3-phase motor protector relays where shown on the Drawings with the following requirements:
  1. Monitors over-voltage, under-voltage and phase sequence.
  2. Adjustable from 390 to 480 volts under and from 440 to 540 volts over.
  3. Form C contacts rated 3 amps at 600 VAC.
  4. 550 VAC maximum input voltage.
  5. Automatic reset.
- B. Provide fuse protection on each incoming phase lead.
- C. Acceptable manufacturers:
  1. Diversified Electronics, Inc., Cat. No. PBD-440-ALE.
  2. Or equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install control devices in accordance with manufacturer's recommendations.
- B. Adjust devices for proper operation as intended.

END OF SECTION



SECTION 26 22 13

LOW VOLTAGE DISTRIBUTION TRANSFORMERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide low voltage distribution transformers as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Physical dimensions, nameplate data, electrical ratings, and manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 GENERAL PURPOSE TRANSFORMERS

- A. Provide transformers manufactured and tested to meet or exceed NEMA ST 20, UL 1562, ANSI C57.12, and IEEE standards.
- B. Provide KVA rating and voltages as shown on the Drawings.
- C. Provide overload capacity of not less than 10 percent for intermittent operation.
- D. Construct transformer to include:
  - 1. Below 30 KVA: Class F or better insulation having a 115 degree C. rise average maximum over a 40 degree C. ambient temperature.
  - 2. 30 KVA and above: Class H or better insulation having a 150 degree C. rise average maximum over a 40 degree C. ambient temperature.
  - 3. High grade, non-aging cores with sheet silicone steel laminations having core plating insulation on both sides of each lamination.
  - 4. Two 2-1/2 percent primary taps above and below nominal voltage.
- E. Provide enclosure for transformer mounted outside of motor control center (MCC):
  - 1. Provide sheet steel, phosphatized having one prime coat and two finish coats of baked enamel finish.
  - 2. Maximum temperature for top of enclosure not to exceed 90 degrees C.

### 2.2 CONTROL TRANSFORMERS

- A. Provide UL listed transformers designed to handle high in-rush currents associated with contactors and relays.
- B. Provide continuous VA rating: Size for 1.25 times capacity required for all components in circuit.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install low voltage distribution transformers in accordance with manufacturer's recommendations.
- B. Install wall-mounted transformers on prefabricated brackets designed for purpose.
- C. Install floor-mounted transformers on 4-inch concrete pad.
- D. Adjust voltage taps for required system voltage when necessary.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide panelboards as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Cabinet dimensions.
  - 2. Nameplate nomenclature.
  - 3. Electrical ratings and characteristics.
  - 4. Type, amperage rating, listing, and position of circuit breakers in panelboard.
  - 5. Manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.
  - 3. Provide all panelboards of one manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Comply with the following standards:
  - 1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
  - 2. NEMA FU 1 - Low Voltage Cartridge Fuses.
  - 3. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
  - 4. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
  - 5. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
  - 6. NEMA PB 1 - Panelboards.
  - 7. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.
  
- B. Comply with the requirements of UL 50, 67, and NEMA PB1 standards.
  
- C. Provide short circuit rating (integral equipment rating) for available fault current.
  
- D. Provide panelboard construction with the following:
  - 1. Neutral bus with terminals.
  - 2. Plated or tinned copper bussing:
    - a. Distributed phase sequence type.
    - b. Ratings as shown on the Drawings, 100 ampere minimum.
  - 3. Branch circuit breakers:
    - a. Comply with Section 26 28 00.
    - b. Ratings as shown on the Drawings.
    - c. UL Class A ground fault circuit protection (GFP) as required.
  - 4. Circuit directory:
    - a. Directory card suitable for complete descriptions.
    - b. Clear plastic cover.
    - c. Card holder attached to inside of panel door.
  
- E. Provide main lugs or main circuit breaker rated as shown on the Drawings.
  - 1. Main circuit breaker: Comply with Section 26 28 00.
  
- F. Listed for non-linear loads.

2.2 FIELD MOUNTED PANELBOARDS

- A. Provide galvanized steel enclosure with rust inhibiting primer and baked enamel finish.

- B. Provide front with following features:
  - 1. Dead front safety type.
  - 2. Concealed adjustable trim clamps.
  - 3. Concealed hinges.
  - 4. Flush stainless steel cylinder tumbler type locks with spring loaded door pulls.
    - a. Locks keyed alike.
- C. Provide engraved laminate plastic type nameplate identifying panelboard with 3/16-inch high white or black letters on background of opposite color.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install panelboards in accordance with manufacturer's recommendations.

#### 3.2 RESTRICTIONS

- A. Separation of hot wires and respective neutral wires where they enter a panelboard is not permitted.
  - 1. All ungrounded and grounded (hot and neutral) conductors of each feeder circuit and each branch circuit must be grouped together where they enter through knock-outs or slots into a panelboard gutter area.
  - 2. Comply with N.E.C. Section 300.20.

#### 3.3 FIELD QUALITY CONTROL

- A. Energize each circuit and check for complete and correct function.

END OF SECTION





SECTION 26 27 16

ELECTRICAL CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide cabinets and enclosures as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Scaled drawings showing dimensions, front view, side view, vertical and horizontal sections, and layout of all equipment inside cabinet and enclosure.
  - 2. Manufacturer's detailed specifications.
  - 3. Door hardware details.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 INTERIOR ELECTRICAL ENCLOSURES

- A. Provide custom-fabricated, wall mounted interior electrical equipment enclosures as follows:
1. NEMA Type 12 construction: Designed for indoor use, with permanently attached door gaskets and drip-shield over door openings.
  2. Constructed from minimum 14 gauge stainless steel with brushed finish.
  3. Seams continuously welded and ground smooth; no holes or knockouts.
  4. Stiffeners welded to back of enclosure to maintain flatness and increase rigidity.
  5. Overall dimensions as shown on the Drawings.
  6. Front access openings with formed edges, one set of formed dual doors (one door overlapping the other without a fixed-in-place mullion in the center of the opening), and/or one formed single door as shown on the Drawings.
    - a. Access openings and doors arranged to provide clear, unobstructed access to all equipment inside enclosure.
    - b. Width of any door not to exceed 36 inches.
    - c. Stiffener welded to each door to prevent twisting and misalignment.
  7. Print pocket inside enclosure.
  8. Interior sub-panel for equipment and components.
  9. Copper ground bus bonded to interior sub-panel and to enclosure.
  10. Flexible copper bonding jumper (braided strap or stranded wire), connected to enclosure and each door and/or hinged inner panel on which current-carrying devices are mounted.
  11. Open bottom with formed, inside facing mounting flange on all sides of opening.
  12. Foil-faced, thermal insulation on all interior surfaces of enclosure and doors.
- B. Acceptable manufacturers:
1. Hoffman.
  2. Or equal.

### 2.2 EXTERIOR ELECTRICAL ENCLOSURES

- A. Provide custom-fabricated, free-standing exterior electrical equipment enclosures as follows:
1. NEMA Type 4X construction: Designed for outdoor use, with permanently attached door gaskets and drip-shield over door openings.
  2. Constructed from minimum 14 gauge stainless steel with brushed finish.
  3. Seams continuously welded and ground smooth; no holes or knockouts.
  4. Stiffeners welded to back of enclosure to maintain flatness and increase rigidity.
  5. Overall dimensions as shown on the Drawings.
  6. Sloped top to prevent water accumulation and ice formation on top surface.
    - a. Slope from front edge to rear edge of enclosure.

7. Front access openings with formed edges, one set of formed dual doors (one door overlapping the other without a fixed-in-place mullion in the center of the opening), and/or one formed single door as shown on the Drawings.
    - a. Access openings and doors arranged to provide clear, unobstructed access to all equipment inside enclosure.
    - b. Width of any door not to exceed 36 inches.
    - c. Stiffener welded to each door to prevent twisting and misalignment.
  8. Restraint mechanism on each door to prevent movement of open door in windy conditions.
    - a. Restraint mechanism to automatically deploy when door is fully opened (100 degrees swing), and must be manually released in order to close door.
  9. Three-point latching system on each single and overlapping door with nylon rollers and oil-tight, weather resistant pad-lockable handle.
  10. Concealed, heavy gauge continuous door hinges with stainless steel pin.
  11. Print pocket inside enclosure.
  12. Interior sub-panel for equipment and components.
  13. Copper ground bus bonded to interior sub-panel and to enclosure.
  14. Flexible copper bonding jumper (braided strap or stranded wire), connected to enclosure and each door and/or hinged inner panel on which current-carrying devices are mounted.
  15. Open bottom with formed, inside facing mounting flange on all sides of opening.
  16. Foil-faced, thermal insulation on all interior surfaces of enclosure and doors.
- B. Acceptable manufacturers:
1. Hoffman.
  2. Or equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install cabinets and enclosures in accordance with manufacturer's recommendations.
- B. Caulk all field punched or drilled openings with silicone sealing compound to maintain leak-proof integrity of exterior surfaces.
- C. Level and plumb cabinets and enclosures on reinforced concrete base.
- D. Adjust doors and door hardware as required for correct alignment and ease of operation.
- E. Repair dented, scratched or marred surfaces to original condition.

END OF SECTION



SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide wiring devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide wiring devices in type and electrical rating for service indicated.
- B. See symbol schedule on Drawings for identification of device type.
- C. Acceptable manufacturers:
  - 1. Hubbell.
  - 2. Leviton.
  - 3. Or equal.

## 2.2 SWITCHES

- A. General use lighting switches:
  - 1. Comply with UL 20, NEMA WD-1, and Federal Specification W-S-896 standards.
  - 2. Provide industrial grade, 20 ampere, toggle type switches.

## 2.3 RECEPTACLES

- A. Comply with UL 498, NEMA WD-1 & WD-6, and Federal Specification W-C-596 standards.
- B. General use single and duplex, 125 volt receptacles:
  - 1. Provide industrial grade, NEMA 5-20R grounding type receptacles rated at 20 amperes.
- C. General use single or duplex 250 volt receptacles:
  - 1. Provide industrial grade, NEMA 6-20R, grounding type receptacles rated at 20 amperes, or as indicated.
- D. Combination duplex receptacles:
  - 1. Provide industrial grade, grounding type receptacles rated at 20 amperes, consisting of one 120 volt and one 250 volt receptacle.
- E. Ground fault circuit interrupter receptacles:
  - 1. Comply with UL 943 Class A standard.
  - 2. Provide industrial grade, GFCI duplex receptacles rated at 20 amperes, 120 volts.
  - 3. Provide construction as follows:
    - a. Shallow depth and NEMA 5-20R configuration.
    - b. Feed-through feature.

## 2.4 WIRING DEVICE PLATES AND COVER

- A. Comply with UL 514D.
- B. Provide wall plates for wiring devices with mounting screws colored to match plate finish.
- C. Plates of interior flush mounted devices: Provide high impact thermoplastic polycarbonate, nylon or stainless steel.
- D. Device plates for surface mounted Type FS or FD boxes: Provide type FSK galvanized steel covers.
- E. Device plates for surface mounted, 4-inch square boxes: Provide 1/2-inch raised galvanized steel covers.

- F. Weatherproof (WP) plates and covers: Provide with gasketed, lift cover.
  - 1. Provide lift cover designed to be fully closed when plug for dedicated equipment is inserted in receptacle.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install wiring devices in accordance with manufacturer's recommendations.
- B. Install gasket plates for devices or system components having light emitting features, such as switch with pilot light.
- C. Install devices at height as specified in Section 26 05 33 or as shown on the Drawings.
- D. Do not use combination type switch/switch or switch/receptacle devices.
  - 1. Provide separate box gang for each switch and receptacle.
- E. Thoroughly clean box interiors from construction dust, debris, etc. prior to installing wiring devices.

#### 3.2 FIELD QUALITY CONTROL

- A. Provide operational testing for devices.
- B. Test receptacles for correct polarity, proper ground connection, and wiring faults.

END OF SECTION





## SECTION 26 28 00

## LOW-VOLTAGE CIRCUIT PROTECTIVE DEVICES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide low-voltage circuit protective devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Electrical ratings, physical size, interrupt ratings, trip curves, I<sup>2</sup>t curves, and manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – Provide the following spare parts to the Owner that match items specified:
  - 1. In three phase circuits: Three (3) fuses of each type and rating.
  - 2. In single phase circuits: Two (2) fuses of each type and rating.

## 1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.
  - 3. Provide overcurrent protective devices by same manufacturer for each type of device.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

## LOW-VOLTAGE CIRCUIT PROTECTIVE DEVICES

26 28 00-1 (120511.40)

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 FUSES

- A. General purpose fuses for protection of motors, transformers, feeders and main service:
  - 1. Use UL Class RK-1 fuses:
    - a. Single end rejection or to fit mountings specified.
    - b. 0-600 ampere rating.
    - c. 200,000 ampere interrupting capacity.
    - d. Dual element, time delay.
    - e. Use Bussman Low Peak LPN-RK, or equal: 250 volt rating.
    - f. Use Bussman Low Peak LPS-RK, or equal: 600 volt rating.
  - 2. Use UL Class L fuses:
    - a. Bolt-in type.
    - b. 601-6,000 ampere rating.
    - c. 200,000 ampere interrupting capacity.
    - d. Time delay.
    - e. Use Bussman HI-CAP, KRP-C, or equal: 600 volt rating.
- B. Acceptable manufacturers:
  - 1. Bussman.
  - 2. Littelfuse.
  - 3. Mersen.
  - 4. Or equal.
- C. General purpose fuses for protection of motor control circuits, lighting ballasts, control transformers, and street lighting fixtures:
  - 1. Use UL Class CC, fast acting, single element fuses.
  - 2. Rated for 0-30 amperes.
  - 3. Provide 200,000 ampere interrupting capacity.
  - 4. Use Bussman Limitron KTK-R, or equal: 600 volt rating.

### 2.2 MOLDED CASE CIRCUIT BREAKERS

- A. General:
  - 1. Comply with UL 489 requirements.
  - 2. Provide thermal and magnetic protection.
- B. Provide permanent trip lighting panel circuit breakers as follows:
  - 1. UL listed SWD (switching duty) on 120 volt circuits where switched circuits are indicated.

2. Short circuit rating (integrated equipment rating):
  - a. Up to 240 volt: 10,000 RMS symmetrical amps minimum.
  - b. Up to 480 volt: 14,000 RMS symmetrical amps minimum.
- C. Provide permanent trip power panel and MCC circuit breakers as follows:
  1. Single magnetic trip adjustment.
  2. Bolt-on type.
  3. Short circuit rating (integrated equipment rating):
    - a. Main: 42,000 RMS symmetrical amps minimum.
    - b. Branch: 14,000 RMS symmetrical amps minimum.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install low-voltage circuit protective devices in accordance with manufacturer's recommendations.

#### 3.2 ADJUSTMENT

- A. Set and record adjustable settings on circuit breakers to provide selective coordination and proper operation.

END OF SECTION



SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide enclosed switches and circuit breakers as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Electrical ratings, physical dimensions, NEMA rating, and manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Provide disconnect with the following ratings:
  - 1. 240 volt or 600 volt AC as required by circuit voltage.
  - 2. Ampere value as shown on Drawings.
  - 3. UL listed short circuit rating of 200,000 RMS amps with Class R fuses where a fused disconnect is indicated.
    - a. Comply with Section 26 28 00.

### 2.2 SAFETY SWITCH

- A. Provide NEMA heavy-duty, quick-make and quick-break type:
  - 1. Cover interlock mechanism with handle attached to box.
    - a. Handle position indication of ON in up position and OFF in down position.
  - 2. Padlock provision in the ON and OFF positions.
  - 3. Provisions for insulated or bonded neutral.
  - 4. Provision for control circuit interlock.

### 2.3 ENCLOSED CIRCUIT BREAKER

- A. Provide molded case circuit breakers:
  - 1. Comply with Section 26 28 00.
  - 2. Cover interlock.
  - 3. Handle position that indicates ON, OFF, or TRIPPED.
  - 4. Padlock provision in the OFF position.
  - 5. External trip indication.
  - 6. Provision for insulated or bonded neutral.
  - 7. Provision for control circuit interlock.

### 2.4 ENCLOSURES

- A. Indoor: Provide NEMA 1 steel construction.
- B. Outdoor area: Provide NEMA 3R or NEMA 4 steel construction.
- C. Corrosive area: Provide NEMA 4X stainless steel construction.
- D. Hazardous area: Provide NEMA 7/9 cast iron or copper free cast aluminum alloy.

### 2.5 NAMEPLATES

- A. Provide engraved laminated plastic type.
- B. Use 3/16-inch high white or black letters on background of opposite color.

- C. Identify disconnect means as follows:
  - 1. Disconnect: For purpose of switch or equipment controlled.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install enclosed switches and circuit breakers in accordance with manufacturer's recommendations.

END OF SECTION





## SECTION 26 29 13.16

## REDUCED-VOLTAGE MOTOR CONTROLLERS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide Solid State Reduced Voltage Starters (SSRVS) as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Enclosure dimensions, nameplate data, electrical ratings and characteristics, wiring diagrams and manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26, including the following:
  - 1. Documentation showing final configuration of each SSRVS.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

## 1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 (latest edition) - National Electrical Code (NEC).
  - 2. Local codes and ordinances.
  - 3. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and indicated.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

## 1.5 SITE CONDITIONS – Reserved.

## 1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Design programmable microprocessor controlled SSRVS utilizing a thyristor (SCR) bridge consisting of at least two SCRs per phase to control starting and stopping of industry standard motors.
- B. Protect driven motor from solid state component failure by means of isolation contactor that opens when the motor is stopped or when the controller detects a fault condition including a shorted thyristor.
- C. All protective features and deceleration control options to be available even when a shorting contactor is employed.
- D. Provide complete with magnetic only circuit breaker for Type 1 short circuit protection. Short circuit withstand rating shall be based on the motor horsepower as defined in UL 508.
- E. Acceptable manufacturers:
  - 1. Allen-Bradley.
  - 2. Square D Company.
  - 3. Cutler-Hammer.
  - 4. Or equal.

### 2.2 RATINGS

- A. Provide SSRVS with the following ratings:
  - 1. Ambient temperature range: 0 to 40 degrees C.
  - 2. Humidity: 93% @ 40 degrees C, non-condensing.
  - 3. Voltage tolerance: +/- 10% of nominal rating.
  - 4. Frequency tolerance: +/- 5% starting, +5% or -15% steady state operation.
  - 5. Capable of supplying 300% rated full load current for 30 seconds at maximum ambient temperature.
  - 6. SCR P.I.V. rating: 1400 VAC (minimum).

### 2.3 ADJUSTMENTS AND CONFIGURATIONS

- A. Provide accessibility to all display units, configuration switches and adjustment potentiometers on the front of the control module. Exposure to control circuit boards or electrical power devices during routine adjustments is prohibited.
- B. Provide digital indication of the following as a minimum:
  - 1. SSRVS status – ready, starting/stopping, run.
  - 2. Motor status – current, torque, thermal state, power factor.
  - 3. Fault status.

- C. Provide SSRVS specifically designed to reduce surges during starting and stopping of centrifugal pumps.
- D. Provide built-in keypad to configure the following operating parameters.
  1. Motor full load amps.
  2. Current limitation on starting.
  3. Torque ramp.
  4. Initial torque.
  5. Torque limit.
  6. Maximum start time.
  7. Selection of freewheel, soft stop, or braking.
  8. Adjustable soft stop torque ramp time.
  9. Selection of Class 10 and 20 motor thermal overload protection.

## 2.4 INPUTS AND OUTPUTS

- A. Provide the following output relays:
  1. One Form A and one Form B minimum for indication of fault or control of an isolation contactor.
  2. One Form A for indication that torque ramp is complete and current is below 130% motor FLA (End of start).
  3. One Form A for indication of FAULT status to remote Pump Control Panel.
- B. Provide the following additional I/O:
  1. One logic input for force to freewheel, indication of external fault, force to local control, or external motor overload reset.
  2. One analog output for 4-20 or 0-20 milliamp indication of motor current, torque, thermal state or power factor.
- C. Provide relay and I/O functions listed above isolated with respect to common.

## 2.5 PROTECTION

- A. Provide microprocessor controlled thermal protection system which continuously calculates the temperature-rise of the motor and SSRVS and provides:
  1. An overload pre-alarm which indicates by relay contact that the motor has exceeded its rated temperature rise by 110%.
  2. A thermal fault condition which stops the motor if the temperature-rise exceeds 120% of the motor thermal capability.
  3. An analog electronic circuit with a time constant adjustable to the motor's thermal cooling time constant ensuring the memorization of the thermal state even after power supply disconnection or shorting out of the power semiconductors.
- B. Provide phase loss, phase reversal, under-load, stall, and jam protection

## 2.6 CONTROLS

- A. Provide control transformer within the enclosure to operate soft start control circuitry 120 Vac, 60 Hz.
- B. Provide door-mounted operator devices as shown on the Drawings.
- C. Provide Ethernet communication module to communicate with PLC.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install SSRVS in electrical enclosures or motor control centers as shown on the Drawings and in accordance with manufacturer's recommendations.

### 3.2 FIELD QUALITY CONTROL

- A. Conduct field tests prior to energization per manufacturers recommendations.
- B. Record and provide results of tests to Engineer.

### 3.3 START-UP AND TESTING

- A. Provide programming, calibration and operational testing.
- B. Set operating parameters as required.

END OF SECTION

SECTION 26 43 00

SURGE-PROTECTIVE DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide surge protective devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 SURGE PROTECTION – SERVICE ENTRANCE

- A. Design surge-protective device to protect AC secondary power line from line transients and other damaging voltage spikes.
- B. Provide surge-protective device with the following requirements:
  - 1. Meets or exceeds the following standards:
    - a. ANSI/IEEE C62.41, C62.45 and C62.11.
    - b. UL 1449.
  - 2. Suitable for service entrance, Category C.
  - 3. Suitable for operation on 480Y/277 volt, 3 phase, 4 wire system, at 60 Hertz.
  - 4. Capable of repeated operations.
  - 5. Replaceable modular protection.
  - 6. Backup redundant protection.
  - 7. 200,000 amperes per phase surge current capacity.
  - 8. Monitoring of normal operation, protection event and protection reduced through indication lamps.
  - 9. Suitable for mounting in service entrance equipment.
- C. Acceptable manufacturers:
  - 1. Square D EMA series.
  - 2. MCG Electronics, Inc.
  - 3. LEA International.
  - 4. Or equal.

### 2.2 SURGE PROTECTION – NON SERVICE ENTRANCE MOTOR CONTROL CENTER

- A. Design surge-protective device to protect AC secondary power line from line transients and other damaging voltage spikes.
- B. Provide surge-protective device with the following requirements:
  - 1. Meets or exceeds the following standards:
    - a. ANSI/IEEE C62.41, C62.45 and C62.11.
    - b. UL 1449.
  - 2. Suitable for operation on 480Y/277 volt, 3 phase, 4 wire system, at 60 Hertz.
  - 3. Capable of repeated operations.
  - 4. Replaceable modular protection.
  - 5. Backup redundant protection.
  - 6. 100,000 amperes per phase surge current capacity.
  - 7. Monitoring of normal operation, protection event and protection reduced through indication lamps.

- C. Acceptable manufacturers:
  - 1. Square D HWA series.
  - 2. MCG Electronics, Inc.
  - 3. LEA International.
  - 4. Or equal.

2.3 SURGE PROTECTION – 480 VOLT CONTROL PANEL/DISTRIBUTION PANEL

- A. Design surge-protective device to protect AC secondary power line from line transients and other damaging voltage spikes.
- B. Provide surge-protective device with the following requirements:
  - 1. Meets or exceeds the following standards:
    - a. ANSI/IEEE C62.41, C62.45 and C62.11.
    - b. UL 1449.
  - 2. Suitable for operation on 480Y/277 volt, 3 phase, 4 wire system, at 60 Hertz.
  - 3. Capable of repeated operations.
  - 4. Replaceable modular protection.
  - 5. Backup redundant protection.
  - 6. 50,000 amperes per phase surge current capacity.
  - 7. Monitoring of normal operation, protection event and protection reduced through indication lamps.
- C. Acceptable manufacturers:
  - 1. Square D HWA series.
  - 2. MCG Electronics, Inc.
  - 3. LEA International.
  - 4. Or equal.

2.4 SURGE PROTECTION – 208/240 VOLT PANEL

- A. Design surge-protective device to protect AC secondary power line from line transients and other damaging voltage spikes.
- B. Provide surge-protective device with the following requirements:
  - 1. Meets or exceeds the following standards:
    - a. ANSI/IEEE C62.41, C62.45 and C62.11.
    - b. UL 1449.
  - 2. Suitable for operation on 240Y/120 volt, single or 3 phase, 3 or 4 wire system, at 60 Hertz. Refer to plans.
  - 3. Capable of repeated operations.
  - 4. Replaceable modular protection.
  - 5. Backup redundant protection.
  - 6. 50,000 amperes per phase surge current capacity.
  - 7. Monitoring of normal operation, protection event and protection reduced through indication lamps.

- C. Acceptable manufacturers:
  - 1. Square D.
  - 2. MCG Electronics, Inc.
  - 3. LEA International.
  - 4. Or equal.

2.5 SURGE PROTECTION – 120 VOLT

- A. Design surge-protective device to protect AC secondary power line from line transients and other damaging voltage spikes.
- B. Provide surge-protective device with the following requirements:
  - 1. Suitable for operation on 120 Volt, at 60 Hertz.
  - 2. Capable of repeated operations.
- C. Acceptable manufacturers:
  - 1. Mersen STT21201PG.
  - 2. Or equal.

2.6 SURGE PROTECTION – LOW VOLTAGE/CONTROL

- A. Design surge-protective device to protect control devices from line transients and other damaging voltage spikes.
- B. Provide surge-protective device with the following requirements:
  - 1. Suitable for operation on low voltage DC.
  - 2. Capable of repeated operations.
- C. Acceptable manufacturers:
  - 1. Pepper-Fuchs FN-LB.
  - 2. Or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install surge-protective devices in accordance with manufacturer's recommendations.

END OF SECTION



## SECTION 26 51 13

## INTERIOR LIGHTING FIXTURES, LAMPS, AND BALLASTS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide interior lighting fixtures, lamps, and ballasts as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

## 1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Photometric data, and manufacturer's detailed specifications.
    - a. Provide fixture shop drawings in booklet form with index and a separate sheet for each fixture, assembled in luminaire "type" alphabetical order, with specified fixture and accessories clearly indicated on each sheet.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

## 1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
  - 1. NFPA 70 National Electrical Code (NEC).
  - 2. Local codes and ordinances.
- B. Fixtures as specified in lighting fixture schedule establish standard of quality for project as determined by Engineer.

- C. Equivalency of fixtures will be determined by Engineer based upon the following criteria:
  - 1. Efficiency.
  - 2. Photometric data (Efficacy, Distribution).
  - 3. Appearance.
  - 4. Construction.
  - 5. Design compatibility.
- D. Provide fixtures that bear UL label and manufacturer's name.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide lighting fixtures of type, size, and rating shown in lighting fixture schedule, complete with, but not necessarily limited to, lamps, lamp holders, ballast, reflectors, starters, wiring, and any other details required for a complete working installation.
- B. Verify ceiling system compatibility with recessed fixture mounting before placing order.
- C. Provide proper trim for each fixture as required for various types of ceiling; plaster rings, fixture ends or caps, suspension units, mounting brackets, and/or other auxiliary parts necessary to make complete fixture.

2.2 LIGHT EMITTING DIODE (LED) FIXTURES

- A. The luminaire shall be constructed as detailed in the plans and will be completely solid state with no moving parts or cooling fans and will meet and exceed the following National Standards and Recommended Global Lighting Safety Publications.
  - 1. The Illuminating Engineering Society of North America (IESNA) new Backlight, Uplight, Glare or BUG standards of measurement provides improved performance descriptions and measurements for outdoor LED luminaires. The TM-15 Luminaire Classification System (ICS) for Outdoor Luminaires classifies luminaire photometric performance related to light trespass, sky glow and high angle brightness control.
  - 2. All Solid State Lighting (SSL) should meet the requirements of accepted safety standards through the independent testing of Nationally Recognized Testing Laboratory (NRTL).

3. The manufacturer shall be an Energy Star Partner and Department of Energy SSL Quality Advocate and be committed to upholding program standards through testing and reporting.
  4. All products and components shall meet safety certifications through Underwriters Laboratories.
- B. LED attributes and design advantages shall include:
1. Environmentally Friendly (no mercury and no lead).
  2. Optional Color Temperatures (a minimum range of 3000K, 4000K and 5000K).
  3. Low maintenance and disposal costs.
  4. Compatible with Photovoltaic and Lighting Control Systems and Components.
- C. The complete luminaire assembly shall be designed to operate the LED optical assembly for a minimum of 50,000 hours in a 25 degree C environment and longer if the ambient temperatures are less. The manufacturer shall warranty the product for 5 years after shipment to the jobsite and will maintain a sales and service organization to support the product. All LED lighting manufacturers must have at least a 5 year history of manufacturing and supplying LED products.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install interior lighting fixtures, lamps, and ballasts in accordance with manufacturer's recommendations.
- B. Verify pendant lengths and placement of outlets and surface-mounted fixtures to maintain alignment, spacings, layout, and general arrangement as shown on the Drawings.
  1. Contractor may vary dimensions slightly to clear obstructions.
  2. Any major changes in arrangement must be approved by Engineer.
- C. Coordinate with other trades so lighting fixtures are properly aligned with items such as diffusers, grilles, and piping.
  1. If necessary, relocate fixtures as directed by Engineer to avoid conflict with other equipment.
- D. Install wires in pendants and seal all fixture pendants to prevent moisture from entering fixture.
- E. Use black self-adhesive polyfoam gasketing around inside edges of frame where necessary to ensure light-tight joints between recessed fixtures and ceiling.

### 3.2 FIXTURE SUPPORTS

- A. Fixture support items and retaining clips: Comply with Section 26 05 29.

3.3 ADJUSTMENT

- A. Adjust and plumb fixtures for proper installation.
- B. Align adjustable fixtures to satisfaction of Engineer.

3.4 FIELD QUALITY CONTROL

- A. At time of Substantial Completion, replace lamps in lighting fixtures observed to be noticeably dimmed after Contractor's use and testing, as judged by Engineer.

END OF SECTION

SECTION 31 23 39

EXCAVATING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Excavate, backfill, compact, and grade the site to the elevations shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.
- C. Comply with requirements of governmental agencies having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 FILL AND EXCAVATED BACKFILL MATERIALS

- A. Provide excavated backfill materials free from organic matter, rubble, or frozen material, containing no rocks or lumps over 6 inches, and with not more than 15 percent of the rocks or lumps larger than 2 inches.

EXCAVATING, BACKFILLING, AND COMPACTING

- B. Fill material is subject to the approval of the Engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soils free from organic matter and other foreign matter.
- C. Do not permit rocks having a dimension greater than 1-inch in the upper 12 inches of fill or embankment.

## 2.2 TOPSOIL

- A. Topsoil is specified under Section 32 92 00 of these Specifications.
- B. Obtain topsoil from sources within the project limits, or provide imported topsoil obtained from sources outside the project limits, or from both sources.

## 2.3 STRUCTURAL BACKFILL MATERIAL

- A. Provide well graded, 100 percent crushed gravel or crushed stone aggregate free of clay, loam, dirt, calcareous or other foreign matter, conforming to the IDOT "Standard Specifications" gradation No. CA 6 with the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
1.500-inch	100%
1.000-inch	90-100%
0.500-inch	60-90%
No. 4	30-56%
No. 16	10-40%
No. 200	4-12%

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 GENERAL CONSTRUCTION REQUIREMENTS

- A. Protection of existing facilities, persons, and property:
  1. Unless shown to be removed, protect existing structures, conduits, active utility lines and all other facilities shown on the Drawings or otherwise made known to the Contractor. If damaged, repair or replace to a condition equal to or better than the original condition at no additional cost to the Owner.
  2. Notify all persons, firms, corporations, or agencies owning or using any existing structures, conduits, or utilities which may be affected by the Work prior to the start of construction.
  3. Make arrangements to locate, maintain, protect, and/or relocate facilities to complete the Work.

4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
  5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.
  6. Barricade and fence open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
  7. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
  8. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.
- B. Dewatering:
1. Remove all water, including stormwater, encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.
  2. Keep excavations and site construction area free from water.
    - a. Whenever during construction operations any loose material is deposited in drainage structures or ditches such that the natural flow line of water is obstructed, remove this material at the close of each working day.
      - (1) At the conclusion of construction operations, keep all drainage structures and flow lines free from dirt and debris.
- C. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- D. Maintain access to adjacent areas at all times.

### 3.3 EXCAVATING

- A. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades, and elevations indicated and specified herein.
- B. Satisfactory excavated materials:
  1. Transport to, and place in, fill or embankment areas within the limits of the Work.
- C. Unsatisfactory excavated materials:
  1. Excavate to a distance below grade as directed by the Engineer, and replace with satisfactory materials.
  2. Include excavation of unsatisfactory materials, and replacement by satisfactory materials, as parts of the work of this Section.
- D. Surplus materials:
  1. Dispose of unsatisfactory excavated material, and surplus satisfactory excavated material, away from the site at disposal areas arranged and paid for by the Contractor.

- E. Topsoil materials:
  - 1. Strip and stockpile topsoil materials from areas to be excavated and regraded for use in final grading.
- F. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.
- G. Borrow:
  - 1. Obtain material required for fill or embankment in excess of that produced within the grading limits of the Work from borrow areas selected and paid for by the Contractor and approved by the Engineer.
- H. Ditches:
  - 1. Cut accurately to the cross-sections, grades, and elevations shown.
  - 2. Maintain excavations free from detrimental quantities of leaves, sticks, trash, and other debris until completion of the Work.
  - 3. Dispose of excavated materials as shown on the Drawings or directed by the Engineer; except do not, in any case, deposit materials less than 3 feet from the edge of a ditch.
- I. Unauthorized excavation:
  - 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the Engineer.
  - 2. Under footings, foundations, or retaining walls:
    - a. Fill unauthorized excavations by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation.
    - b. When acceptable to the Engineer, lean concrete fill may be used to bring the bottom elevation to proper position.
  - 3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the Engineer.
- J. Stability of excavations:
  - 1. Slope sides of excavations to 1:1 or flatter, unless otherwise directed by the Engineer.
  - 2. Shore and brace where sloping is not possible because of space restrictions or stability of the materials being excavated.
  - 3. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.
- K. Sheeting and bracing:
  - 1. Design, provide, and install sheeting and bracing as may be necessary for safety of personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.
  - 2. Maintain sheeting and bracing in excavations regardless of the time period excavations will be open.
  - 3. Remove sheeting and bracing after the excavation has been backfilled to an elevation which will prevent caving of exposed sidebanks.



4. Fill voids left by the withdrawal of sheeting with compacted sand.
5. Leave sheeting and bracing in place whenever necessary to protect adjacent facilities or property.

L. Excavating for structures:

1. Conform to elevations and dimensions shown within a tolerance of 0.10 ft., and extending a sufficient distance from footings and foundations to permit placing and removing concrete formwork, installation of services, other construction required, and for inspection.
2. In excavating for footings and foundations, take care not to disturb bottom of excavation:
  - a. Excavate by hand tools to final grade just before concrete is placed.
  - b. Trim bottoms to required lines and grades to leave solid base to receive concrete.
3. Excavate for footings and foundations only after general site excavating, filling, and grading are complete.
4. Allowable net soil bearing pressure: 2,500 psf minimum unless otherwise required on the Drawings.
  - a. Provide equipment and services of an independent geotechnical testing laboratory to determine allowable net soil bearing pressure complying with pertinent provisions of Section 01 45 29.
  - b. Include cost of the testing in the total amount of the contract price for excavating, backfilling, and compacting work.
  - c. Check every 500 square feet with minimum of two (2) tests per foundation or as directed by the Engineer.

M. Excavating for pavements:

1. Cut surface under pavements to comply with cross-sections, elevations, and grades.

N. Cold weather protection:

1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F.

### 3.4 FILLING AND BACKFILLING

A. General:

1. For each classification listed below, place acceptable soil material in layers to required subgrade elevations.
2. In excavations:
  - a. Use satisfactory excavated backfill or borrow fill materials.
3. Under concrete or bituminous pavements:
  - a. Use subbase materials as specified under Section 32 10 00 of these Specifications.
4. Under slabs, footings, conduits and other structures and facilities:
  - a. Use structural backfill material.

B. Backfill excavations as promptly as progress of the Work permits, but not until completion of the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing and waterproofing.

## EXCAVATING, BACKFILLING, AND COMPACTING

31 23 39-5 (120511.40)

2. Inspecting, testing, approving, and recording locations of underground utilities.
  3. Removing concrete formwork.
  4. Removing shoring and bracing, and backfilling of voids with satisfactory materials.
  5. Removing trash and debris.
  6. Placement of horizontal bracing on horizontally supported walls.
- C. Ground surface preparation:
1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious matter from ground surface prior to placement of fills.
  2. Plow, strip, or break up sloped surfaces steeper than one vertical to four horizontal so that fill material will bond with existing surface.
  3. When existing ground surface has a density less than that specified under "compacting" for the particular area, break up the ground surface, pulverize, moisture condition to the optimum moisture content, and compact to required depth and percentage of maximum density.
- D. Placing and compacting:
1. Place excavated backfill and fill materials in layers not more than 12 inches in loose depth.
  2. Place structural backfill material in layers not more than 6 inches in loose depth.
  3. Compact each layer to the required density for the area.
  4. Do not place backfill or fill material on surfaces that are muddy, frozen, or containing frost or ice.
  5. Place backfill and fill materials evenly adjacent to structures, to required elevations.
  6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.
  7. Where the construction includes basement or other underground walls having structural floors over them, do not backfill such walls until the structural floors are in place and have attained sufficient strength to support the walls.
  8. Compact each layer of structural backfill material with vibratory rollers, pneumatic tampers, or other compacting equipment approved by the Engineer.

### 3.5 GRADING

- A. General:
1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
  2. Smooth the finished surfaces within specified tolerance.
  3. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.

- B. Grading around structures:
1. Grade areas adjacent to structures to achieve drainage away from the structures, and to prevent ponding.
  2. Finish the surfaces to be free from irregular surface changes, and:
    - a. Shape the surface of areas scheduled to be under walks to line, grade, and cross-section, with finished surface not more than 0.10 ft. above or below the required subgrade elevation.
    - b. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.05 ft. above or below the required subgrade elevation.

### 3.6 COMPACTING REQUIREMENTS

- A. Control soil compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D1557 or AASHTO T-180.
1. Provide equipment and services of an independent geotechnical testing laboratory for density tests complying with pertinent provisions of Section 01 45 29.
  2. Include the cost of the testing in the total amount of the contract price for excavating, backfilling, and compacting work.
  3. Test density of each lift for every 2,500 square feet of compacted backfill and fill placed.
- B. Provide not less than the following maximum density of soil material compacted at optimum moisture content for the actual density of each layer of soil material in place, and as approved by the Engineer.
1. Structures:
    - a. Compact the top 8 inches of subgrade and each layer of fill material or backfill material at 95 percent of maximum density.
  2. Lawn and unpaved areas:
    - a. Compact the top 8 inches of subgrade and each layer of fill material or backfill material at 85 percent of maximum density.
    - b. Compact the upper 12 inches of filled areas, or natural soils exposed by excavating, at 85 percent of maximum density.
  3. Walks:
    - a. Compact the top 8 inches of subgrade and each layer of fill material or backfill material at 90 percent of maximum density.
  4. Pavements:
    - a. Compact the top 8 inches of subgrade and each layer of fill material or backfill material at 90 percent of maximum density.
- C. Moisture control:
1. Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.
  2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.

3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry.
  - a. Assist drying by discing, harrowing, or pulverizing.

### 3.7 MAINTENANCE

- A. Protection of newly graded areas:
  1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds.
  2. Repair and reestablish grades in settled, eroded, and rutted areas to the specified tolerances.
- B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

END OF SECTION

SECTION 31 23 79

TRENCHING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Trench, backfill, and compact as specified herein and as needed for installation of underground pipelines and utilities associated with the Work.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.
- C. Comply with requirements of governmental agencies having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 GRANULAR PIPE BEDDING AND COVERING MATERIALS

- A. Provide well graded, washed, mixture of gravel or crushed stone aggregate free of clay, loam, dirt, calcareous or other foreign matter conforming to the IDOT "Standard Specifications" gradation CA 15, or the Standard Specifications for Water and Sewer Construction in Illinois, with the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
½-inch	100%
3/8-inch	60 -90%
No. 4	0 -14%
No. 16	0 - 4%

1. For flexible thermoplastic pipes: Comply with ASTM D2321, Class I or II as modified below.
  - a. Exclude sharp angular granular materials.
  - b. Do not use Class II materials in wet conditions.

### 2.2 EXCAVATED BACKFILL MATERIALS

- A. Provide soil materials free from organic matter, rubble, or frozen material, containing no rocks or lumps over 6 inches, and with not more than 15 percent of the rocks or lumps larger than 2 inches.

### 2.3 GRANULAR BACKFILL

- A. Provide either granular material.
1. Granular material: Use 100 percent crushed stone or gravel complying with the IDOT "Standard Specifications" gradation No. CA 6.

### 2.4 GEOTEXTILE FABRIC

- A. Provide geotextile fabric for separation of granular material and native soil in areas where trench is over-excavated to remove unsuitable materials.
1. Acceptable manufacturers:
    - a. Mirafi: 160N.
    - b. Synthetic Industries: 601.
    - c. Or equal.

### 2.5 WATER MAIN REPAIR

- A. Repair water main or water services damaged during construction utilizing products of type and manufacturers as approved by the Owner.

- B. Pipe couplings for joining of sections of cut water main where a section of new pipe is used to replace a broken pipe.
  - 1. Acceptable manufacturers:
    - a. Dresser Style 38.
    - b. Smith-Blair CC-441.
    - c. Or equal.
- C. Repair clamps for broken or cracked pipe and sealing of existing corporation stop opening.
  - 1. Use full-circle single band all stainless steel clamps.
  - 2. Acceptable manufacturers:
    - a. Dresser Style 360.
    - b. Smith-Blair 200 Series.
    - c. Or equal.
  - 3. Replace damaged service corporation stops by installation of full-circle single band all stainless steel clamps, with service outlet, matching manufacturer's and styles used for repair of a cracked pipe.

## 2.6 DRAIN TILE REPLACEMENT

- A. Replacement pipe: New pipe of the same size. Match material or use new PVC SDR 26 pipe per ASTM D3034.
- B. Utilize flexible couplings with stainless steel bands for connecting new pipe to old pipe.
- C. Provide CA 6 or CA 7 aggregate for backfill material.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 GENERAL CONSTRUCTION REQUIREMENTS

- A. Protection of existing facilities:
  - 1. Unless shown to be removed, protect existing structures, conduits, active utility lines and all other facilities shown on the Drawings or otherwise made known to the Contractor. If damaged, repair, replace, or restore to a condition equal to or better than the original condition at no additional cost to the Owner.
  - 2. Notify all persons, firms, corporations, or agencies owning or using any existing structures, conduits, or utilities which may be affected by the Work prior to the start of construction.

## TRENCHING, BACKFILLING, AND COMPACTING

31 23 79-3 (120511.40)

3. Make arrangements to locate, maintain, protect, and/or relocate facilities in order to complete the Work.
4. Make such exploration as is necessary to determine the exact location of underground utilities.
5. Exercise care during the progress of work in the area to prevent damage to the utilities.
6. Whenever it becomes necessary to relocate underground gas mains, telephone conduit, or electrical lines or support or relocate utility poles, the utility company involved will make such relocation or provide pole support. Notify the utility company promptly.
7. Whenever it becomes necessary to relocate water or other pipes or conduits, in direct conflict with the proposed pipe, and which are not shown on the Drawings, obtain the direction from the Engineer for the relocation.
  - a. Compensation will be allowed only for such quantities as directed by the Engineer.
8. Do not block or obstruct streets and pavements.
9. Whenever during construction operations any loose material is deposited in drainage structures or ditches such that the natural flow line of water is obstructed, remove this material at the close of each working day.
  - a. At the conclusion of construction operations, keep all drainage structures and flow lines free from dirt and debris.
10. Do not obstruct accessibility of fire hydrants.
11. Maintain access to adjacent areas at all times.

B. Protection of Trees and Shrubs:

1. Protect trees and shrubs from damage.
2. Do not remove trees or shrubs unless indicated on the Drawings or authorized in the field by the Engineer.
3. Where trees which are to remain interfere with normal excavation operations, use the following procedures:
  - a. Prior to excavation, carefully remove trees with trunk diameters of less than 4 inches, shrubs, and other plantings in the way of construction.
  - b. Do not machine excavate within a distance of three trunk diameters or 12 inches (whichever is greater) of any tree, and do not cut roots over 2-inch diameter unless approved by the Engineer.
  - c. Excavate by hand when closer than three tree trunk diameters or 12 inches (whichever is greater).
  - d. Tie back shrubs and tree limbs to prevent loss or damage.
  - e. Prune damaged limbs and branches.
  - f. Provide plank wrappers wired in place to protect tree trunks from being damaged by trench machinery, tractors, or trucks; remove protective planking as soon as practical after work in vicinity has been completed.
  - g. Remove spoil banks from around trees by hand to prevent damage to trunks by construction machinery.



4. Replace trees and shrubs which cannot be protected or are damaged during construction:
  - a. Replant or replace with stock of like character, quality, species, size, shape, color and condition upon completion of the construction.
  - b. Replace 4-inch diameter and larger trees with one 4-inch diameter size tree for each 6" of original tree diameter or fraction thereof.
  - c. Replace trees smaller than 4-inch diameter and shrubs with same kind and type.
  - d. As an option, replant trees smaller than 2-inch diameter or shrubs that are not damaged.
5. Remove and replace trees and shrubs that do not survive in good condition for a period of 18 months after time of planting.

### 3.3 TRENCHING

- A. Provide and maintain sheeting, shoring, and bracing necessary for protection of the Work, adjacent property, and for the safety of personnel.
  1. Remove temporary sheeting and bracing after backfilling to an elevation that will prohibit caving of exposed sidebanks.
  2. Fill voids left by the withdrawal of sheeting with compacted sand.
  3. The Engineer may direct that supports in trenches be cut off at any specific elevation to protect adjacent facilities or property. Compensation for support left in place will be negotiated.
  4. No extra payment will be made for the supports left in place without the direction of the Engineer.
  5. Do not leave supports within 4 feet of the ground or pavement surface in place without the permission of the Engineer.
- B. Provide pumping, bailing, wellpointing, and construct ditches and dikes required to dewater and drain ground water, sewage, or stormwater to keep the excavation and site dry for the completion of the Work.
- C. Excavation:
  1. Excavate trenches to the depths and grades necessary for the pipelines with allowances for bedding material.
    - a. Comply with the following minimum depth of cover unless otherwise noted on the Drawings.
      - (1) Sewage piping: 5 feet.
      - (2) Electrical or wiring conduits and cables: 30 inches.
  2. Over-excavate organic, soft, spongy, or otherwise unsuitable soils found at or below the bottom of the trench to meet firm subsoil or as directed by the Engineer.

3. Comply with the following maximum trench widths at the top of pipelines:

<u>Nominal Pipe Sizes (inches)</u>	<u>Trench Widths (inches)</u>
12 or smaller	30
14 - 18	36
20 - 24	42

#### 3.4 EXCAVATION FOR APPURTENANCES

- A. Excavate for manholes and similar structures to the depths as shown on the Drawings and to a distance sufficient to leave at least 12 inches clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.
- B. Over-depth excavation beyond depths indicated on the Drawings that has not been directed will be considered unauthorized. Fill with granular material or lean concrete as directed by the Engineer, and at no additional cost to the Owner.

#### 3.5 BEDDING AND COVERING OF PIPE

- A. General:
1. Bedding is defined as the shaped and tamped material that supports the pipes. Covering is defined as the compacted material that protects and covers the pipes.
  2. Provide continuous bedding and covering for underground pipelines.
- B. Pipe bedding:
1. Provide compacted granular pipe bedding and covering material with a minimum thickness of 4 inches under pipe barrels and 2 inches under bells.
  2. Wherever the trench is over-excavated due to the removal of unsuitable material, refill the excavated area to the bottom of the pipe bedding with material conforming to the IDOT "Standard Specifications" gradation CA 1.
    - a. Removal and replacement of material, or unsuitable material, to a depth of one foot below the bottom of the pipe barrel is considered incidental to installation of the pipe.
  3. Wherever the trench is over-excavated to remove unsuitable material, install geotextile fabric between native soil and granular material:
    - a. Install fabric to cover bottom and sides of trench to heights as follows:
      - (1) For all flexible pipe and rigid pipe 24-inch and smaller: to envelop entire bedding and covering material and overlap 1-foot at the top.
      - (2) Where undercut is of a depth that requires more than one piece of fabric to provide envelope, provide sewn seams between sections of fabric.

#### TRENCHING, BACKFILLING, AND COMPACTING

31 23 79-6 (120511.40)

4. Wherever two or more pipes or conduits are placed in the same trench or excavated area, backfill the trench with granular pipe bedding and covering material to support the uppermost pipe or conduit.
  5. Provide sand bedding with a minimum thickness of 3 inches under electrical and wiring conduits and cables.
- C. Pipe covering:
1. Following placement of pipe and inspection of joints, provide compacted granular pipe bedding and covering material for the full width of the trench to the following levels unless otherwise shown on the Drawings:
    - a. For all pipe: To 12 inches above the top of the pipe.
  2. Place granular pipe bedding and covering material in uniform loose layers not exceeding 8 inches thick.
    - a. Compact each layer firmly by ramming or tamping with tools approved by the Engineer in such a manner as not to disturb or injure the pipe to yield a minimum density of 95 percent of maximum dry density as determined according to ASTM D1557 or AASHTO-T180.
  3. Where trench is widened by installation of structures, extend bedding and covering materials to total width of excavations and compact as noted in following section.
    - a. As a contractor's option, to eliminate compacting of the material, replace bedding and covering material with flowable fill at no additional cost to Owner.

### 3.6 TRENCH BACKFILLING AND COMPACTING

- A. General:
1. Backfill trench from the top of pipe cover to topsoil, paving subgrade, or foundation level.
  2. If trenches settle during the period of construction and within the guarantee period of the work, fill trench back to the surrounding grade, and restore the surfaces.
- B. For trench in lawns, parkways, and other improved areas not subject to vehicular traffic:
1. Backfill with excavated materials in uniform loose layer not exceeding 12 inches thick.
  2. Compact each layer of trench backfill materials to yield a minimum of 85 percent of maximum dry density as determined according to ASTM D1557 or AASHTO-T180.
- C. For trench in streets, parking areas, driveways, or within 2 feet of any proposed curb and gutter, sidewalk, or other paved areas:
1. Backfilling with granular backfill materials:
    - a. Place in uniform loose layer not exceeding 12 inches thick and compact with vibrating roller or equivalent.

### TRENCHING, BACKFILLING, AND COMPACTING

31 23 79-7 (120511.40)

- b. Fill the top of trenches with temporary aggregate pavement material to the depth(s) required to provide aggregate base and pavement base, binder and surface courses of the depths(s) shown in the Details in the Drawings.
2. Compacting requirements:
  - a. Compact each layer of trench backfill materials to yield a minimum density of 90 percent of maximum dry density as determined according to ASTM D1557 or AASHTO T-180.
  - b. Determine the density of compacted backfill at intervals of not more than 500 feet at locations selected by the Engineer.
  - c. Provide the services of an independent testing laboratory for the density tests complying with the pertinent provisions of Section 01 45 29.
3. Maintain temporary aggregate pavement level with adjoining pavement surfaces until the permanent pavement is placed.

### 3.7 BACKFILL AND BEDDING FOR APPURTENANCES

- A. Provide 3 inches of granular bedding material unless otherwise shown on the Drawings.
- B. Do not backfill until new concrete has properly cured, and any required tests have been accepted.
- C. Backfill in lawns and landscaped areas with excavated materials.
- D. Backfill in pavement around manholes, valve boxes, and other structures as directed by the Engineer with granular backfill materials.

### 3.8 FINISH GRADING

- A. General:
  1. Provide finish grading and filling to achieve the lines and grades.
  2. Slope grades to drain away from structures.
  3. Replace culverts damaged during the construction with new culverts of the same size and type unless instructed differently in other sections of these Specifications.
- B. Finish grading:
  1. Except where mounding over trenches is specified, grade smooth areas of the Work including previously grassed areas that have been disturbed, and adjacent transition areas.
  2. Fill and compact depressions from settlement and round tops of embankments and breaks in grade.
  3. Protect newly graded areas from traffic and erosion. Repair settlement or washing away that may occur prior to surface restoration and re-establish grades to the required elevations at no additional cost to the Owner.

- C. Disposal of waste excavated material:
  - 1. Remove unsuitable and surplus excavated materials not used for backfilling from the project site.
  - 2. Do not deposit on public or private property without written permission from property owner or authorized representative of appropriate public agency.

### 3.9 WATER MAIN REPAIR

- A. Whenever existing water mains and water service pipes are damaged during construction, stop the pipe installation work and immediately repair the damaged portion of the existing piping.
- B. Contact the Engineer and Owner immediately to report the location and extent of the damage.
- C. Repair the water main with methods complying with the "Standards for Water and Sewer Construction in Illinois", and any additional requirements required by the Owner.
- D. Utilize only materials of repair as noted in the products section of this specification or as dictated by the Owner.
- E. Where water services have been stripped or pulled from the water main, replace the corporation stop as instructed by the Engineer and Owner, and replace the water service pipe to a point as directed by the Owner.
- F. Comply with disinfection requirements as dictated by the Owner.
- G. Do not cover the repair until work is inspected and approved by Owner.

### 3.10 DRAIN TILE REPLACEMENT

- A. Replace all drain tile disturbed or damaged with new pipe of the same size, at same grade and slope, and utilizing flexible couplings for connection to existing pipe.
- B. Indicate location, depth, and size of drain tile on Job Set of plans.
- C. Provide aggregate backfill from bottom of trench to a minimum of 12 inches above new drain pipe.
- D. Inform Engineer immediately when drain tiles are encountered as a part of the trenching operation.
  - 1. Drain tile repair conducted without the observance of the Engineer will not be paid for.

END OF SECTION



SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide soil erosion and sediment controls as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. "Illinois Urban Manual", a technical manual designed for Urban Ecosystem Protection and Enhancement, prepared by the United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) and the Illinois Environmental Protection Agency (IEPA), latest revision.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE

- A. Provide adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide soil erosion and sediment controls in accordance with the "Illinois Urban Manual" and the IDOT "Standard Specifications".

EROSION AND SEDIMENTATION CONTROLS

31 25 00-1 (120511.40)

- B. Provide manufacturer's certification that product meets the minimum specified value, if requested by the Engineer.

## 2.2 TEMPORARY EROSION AND SEDIMENT CONTROL SYSTEMS

- A. Silt fence:
1. Material: Geotechnical fabric of woven or nonwoven filaments of polypropylene, polyester, or polyethylene.
    - a. Non-woven fabric: Needle-punched, heat-bonded, resin-bonded, or a combination thereof.
    - b. Filaments: Dimensionally stable, resistant to delamination, free from chemical treatments or coatings that reduce porosity and permeability, and resistant to ultraviolet radiation.
    - c. Properties:
      - (1) Width: 3.5 feet minimum.
      - (2) Weight: 4.0 ounces per square yard minimum ASTM D-3776-96 (2002).
      - (3) Grab tensile strength: 200 pounds minimum, ASTM D-4632.
      - (4) Grab. elongation @ failure: 15 percent minimum ASTM D-4632.
      - (5) Burst strength: 250 psi minimum ASTM D-751.
      - (6) Equivalent opening size (EOS) US Standard sieve number: non-woven - 30 minimum, woven - 50 minimum.
    - d. Acceptable products:
      - (1) Mirafi 100X by Mirafi, Inc., Charlotte, North Carolina.
      - (2) Supac 5WS by Phillips Fibers Corp., Greenville, South Carolina.
      - (3) Or equal.
  2. Support posts:
    - a. Type:
      - (1) Treated wood: 2-inch by 4-inch or 3.0 square inch cross section.
      - (2) Steel: Standard "T" or "U" sections weighing not less than 1.00 pound per linear foot.
    - b. Length: 4½ feet, minimum.
    - c. Interval: 5 feet (typical).
  3. Use metal staples, nails, or wire to fasten fabric to posts.
- B. Temporary cover:
1. Comply with pertinent portions of Section 32 92 00 of these Specifications for purity and germination.
  2. Seed: Annual rye, spring oats, or winter wheat.
- C. Inlet Protection Filter:
1. Provide a drainage structure inlet filter assembly consisting of a steel frame, replaceable geotextile fabric bag, reinforced filter basket, stainless steel band suspended from the frame, and an overflow feature.
  2. Provide a frame of rigid galvanized steel meeting the requirements of ASTM A36.



3. Provide a filter bag constructed of a non-woven geotextile fabric with the following properties:
    - a. Minimum weight: 4 ounces per square yard.
    - b. Minimum flow rate: 145 gallons per minute per square foot.
    - c. Minimum silt and debris capacity: 2 cubic feet.
  4. Provide reinforced filter basket of polyester or stainless steel mesh.
  5. Acceptable products:
    - a. FlexStorm Inlet Filter by Inlet & Pipe Protection, Inc.
    - b. Catch-All by Marathon Materials, Inc.
    - c. Or equal.
- D. Silt bag:
1. Provide filter or silt bags for dewatering pump discharge hoses used to lower the water table and allow trench work or structure installation.
  2. Utilize bags made of non-woven geotextile material.
  3. Acceptable products:
    - a. Silt Bag by Layfield.
    - b. Dirtbag by Geo-Synthetics.
    - c. Or equal.
- E. Compost filter sock (can be used in lieu of silt fence):
1. Provide compost filter socks consisting of a compost material placed inside a geotextile bag, and held in place with wood support posts/stakes.
    - a. Socks shall be minimum 12" diameter, unless otherwise shown on Drawings.
    - b. Compost shall meet Material Specification 806, Coarse Compost, as described in the Illinois Urban Manual.
    - c. Geotextile bags consisting of photodegradable or biodegradable knitted material with openings of 3/8 inches to contain the compost/wood chip material, but not limiting water infiltration.
  2. Provide support posts consisting of wood stakes with minimum dimensions of 2-inch x 2-inch, with a minimum length of 28 inches for 12-inch diameter compost filter logs.
  3. Acceptable products:
    - a. Filtrex Silt Soxx.
    - b. Or equal.

### 2.3 EROSION CONTROL BLANKET OR MAT

- A. Excelsior blanket:
1. Machine-produced mat of wood excelsior from wood properly cured to produce adequately curled and barbed fibers.
    - a. Fiber length: 80 percent minimum at 6 inches or longer.
  2. Properties:
    - a. Width: 24 inches minimum.
    - b. Weight: 0.9 pounds per square yard minimum.
    - c. Length of roll: 150 feet minimum.

3. Cover the top side of the blanket with a 60-day photodegradable, extruded plastic mesh netting or 12-month biodegradable natural (jute fiber) mesh netting.
    - a. Minimum opening: 5/8-inch by 5/8-inch.
    - b. Maximum opening: 2 inches by 2 inches.
  4. Acceptable products:
    - a. American Excelsior Company.
    - b. North American Green.
    - c. Or equal.
- B. Knitted straw mat:
1. Machine-assembled blanket of clean, weed-free straw from agricultural crops, of approximately 1/2-inch loose thickness.
  2. Cover the top side of the mat with a photodegradable plastic (polypropylene) or biodegradable natural (jute fiber) mesh netting with 3/8-inch by 3/8-inch square openings.
    - a. Attach mesh to the mat with photodegradable or biodegradable knitting thread.
  3. Supply blanket in protected rolled mat form of 6'-6" width, with a dry weight of 0.70 pounds per square yard minimum.
  4. Acceptable products:
    - a. S150BN by North American Green.
    - b. Curlex 1 by American Excelsior.
    - c. Or equal.
- C. Straw/coconut fiber mat:
1. Machine-assembled blanket of clean, weed-free 70 percent straw from agricultural crops and 30 percent coconut fiber, of approximately 1/4-inch thickness.
  2. Cover the top side of the mat with a photodegradable plastic (polypropylene) or biodegradable natural (jute fiber) mesh netting with 3/8-inch by 3/8-inch square openings.
    - a. Attach mesh to the mat with photodegradable or biodegradable knitting thread.
  3. Supply blanket in protected rolled mat form of 6'-6" width, with a dry weight of 0.50 pounds per square yard minimum.
  4. Acceptable products:
    - a. SC150BN by North American Green.
    - b. Or equal.
- D. Coconut fiber blanket:
1. Machine-assembled mat of 100 percent coconut fiber, of approximately 1/4-inch thickness.
  2. Cover the top side of the mat with a photodegradable plastic (polypropylene) or biodegradable natural (jute fiber) mesh netting with 3/8-inch by 3/8-inch square openings.
    - a. Attach mesh to the mat with photodegradable or biodegradable knitting thread.

3. Supply blanket in protected rolled mat form of 6'-6" width, with a dry weight of 0.50 pounds per square yard minimum.
  4. Acceptable products:
    - a. C125BN by North American Green.
    - b. Or equal.
- E. Staples: 11-gage wire, 6 inches long.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Prepare subgrade for the installation of erosion and sediment control systems to the lines and grades shown on the Drawings.
  1. Repair eroded or washed out areas prior to the installation of erosion and sediment control systems.

### 3.2 SILT FENCE

- A. Install silt fence where shown on the Drawings and as directed by the Engineer.
  1. Perform maintenance as needed.
  2. Remove material when it reaches 1/3 of the fence height, and as directed by Engineer.
  3. Replace fence where it is torn or otherwise damaged.
  4. Retrench or replace fence that is not properly entrenched or anchored.
  5. Remove fence upon completion of Work, or as directed by Engineer.

### 3.3 TEMPORARY GRASS

- A. Install temporary grass where shown on the Drawings, in accordance with pertinent provisions of Section 32 92 00 of these Specifications.

### 3.4 INLET PROTECTION FILTER

- A. General:
  1. Verify the number and dimensions of the drainage structure frames for installation of the inlet filter assemblies.
  2. Inspect and clean filters weekly and after every rainfall.
  3. Dispose of debris removed at an approved location.
  4. Remove filter assembly as directed by the Engineer.
  5. The drainage structure inlet filter assembly will remain the property of the Contractor.

### 3.5 SILT BAG

- A. Provide protection from sedimentation to storm sewers, streams, ponds, or wetlands during well pointing or trench dewatering by the use of silt bags or silt socks at the hose or pipe discharge points.

- B. Dispose of collected silt or sediment offsite or at locations approved by the appropriate permitting authority.

### 3.6 COMPOST FILTER SOCK (CAN BE USED IN LIEU OF SILT FENCE)

- A. Install compost filter socks at locations shown, or as indicated by notes, on Drawings.
- B. Stake compost filter socks in place with wood support posts.
  - 1. Drive wood stakes through logs with at least 12 inches of the stake in the ground and 3 inches of the stake above the filter log. Install stakes every 10 feet along each log unless conditions warrant closer spacing.
    - a. Where more than one log is needed to achieve planned lengths, ends shall be overlapped at least 12 inches with both ends staked into place.
- C. Perform maintenance as needed. Remove collected silt or sediment when silt/sediment reaches one-half the height of filter sock(s).
- D. Remove compost filter socks upon completion of Work, or as directed by Engineer.

### 3.7 EROSION CONTROL MATTING OR FABRIC

- A. Install erosion control matting or fabric where shown on the Drawings, in accordance with manufacturer's recommended installation procedures, and as directed by the Engineer.
- B. Immediately after rolling seeded area, place erosion control matting or fabric on slopes steeper than 3 horizontal to 1 vertical.
  - 1. Unless otherwise specified, place erosion control matting or fabric at sides and bottoms of ditches, swales, and areas within 10 feet of catch basins in seeded areas.

END OF SECTION

SECTION 32 10 00.19

STREET, DRIVEWAY, AND SIDEWALK REPLACEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes replacement of streets, driveways, and sidewalks removed or damaged during pipeline and structure construction.
- B. Provide base course and surface courses as specified herein, and as needed for a complete replacement of, or construction of new or extended, streets, driveways, and sidewalks.
- C. Construct streets, driveways, and sidewalks in accordance with IDOT "Standard Specifications for Road and Bridge Construction", hereby referred to as IDOT "Standard Specifications".
- D. Related work:
  - 1. Comply with only the pertinent provisions of this Section for the type of replacement required for the Work.
  - 2. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 - General Requirements of these Specifications.
- E. References:
  - 1. Reserved.

1.2 SUBMITTALS - Reserved.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 BASE COURSE

- A. Aggregate:
  - 1. Provide well graded, 100 percent crushed gravel or crushed stone aggregate free of clay, loam, dirt, calcareous or other foreign matter conforming to the IDOT "Standard Specifications", gradation No. CA 6.

STREET, DRIVEWAY, AND SIDEWALK REPLACEMENT

32 10 00.19-1 (120511.40)

## 2.2 SURFACE COURSE

- A. Hot-mix asphalt: Comply with applicable articles of Section 406 of the IDOT "Standard Specifications" and the most recent IDOT District 1 Special Provisions, "HMA Mixture Design Requirements", "Ground Tire Rubber (GTR) Modified Asphalt Binder", "Friction Agreement" and the BDE Special Provision for "Hot-Mix Asphalt Density Testing for Longitudinal Joints".
1. Hot-mix asphalt surface course: Use Hot-mix asphalt Surface Course, Mix "D", N50.
    - a. Mix type: IL 9.5 mm.
    - b. 4% air voids @ 50 gyrations.
  2. Hot-mix asphalt binder course:
    - a. Use Hot-mix asphalt Binder Course, IL-19, N50.
      - (1) Mixture type: IL 19.0 mm.
      - (2) 4% air voids @ 50 gyrations.
  3. Hot-mix asphalt leveling binder:
    - a. Use Hot-mix asphalt Leveling Binder (Machine Method), N50.
      - (1) Mixture type: IL 9.5 mm..
      - (2) 4% air voids @ 50 gyrations.
  4. Hot-mix asphalt driveway:
    - a. Use Hot-mix asphalt Surface Course, Mix "D", N50.
      - (1) Mixture type: IL 9.5 mm.
      - (2) 4% air voids @ 50 gyrations.

## PART 3 - EXECUTION

### 3.1 GENERAL CONSTRUCTION REQUIREMENTS

- A. Comply with the applicable articles of the following Sections of the IDOT "Standard Specifications" except as modified herein:
1. Base courses:
    - a. Aggregate Type A or Type B: Section 351.
  2. Surface courses:
    - a. Hot-mix asphalt: Section 406.
  3. Prime coats: Section 406.
- B. Maintain the temporary pavement material installed during trench backfilling as temporary driving surface.
1. Shape the road bed to provide positive drainage.

### 3.2 REMOVAL OF EXISTING PAVEMENT SURFACES

- A. Remove and dispose of all existing pavement surface materials as necessary to complete the Work.
1. Remove all existing street and driveway pavements, including surfaces, bases and stabilized subbases, curbs and gutters, and sidewalks to a width of not less than one foot on undisturbed ground on each side of the trench excavation.

2. Saw cut to a full depth to provide a straight line joint between the existing pavement, curb and gutter or sidewalk which will remain and the portion to be removed and replaced.
  - a. Remake the saw cut joint as required at the time of resurfacing.
3. Do not use any broken pavement, curb and gutter or sidewalk materials for backfilling the trench.

### 3.3 REPLACEMENT OF PAVEMENT SURFACES

- A. Reconstruct street and driveway pavement including surfaces, bases, and stabilized sub-bases; removed or damaged as a result of the construction or construct new pavement as shown on the Drawings.
  1. Set all manholes, valve boxes, and other structures and appurtenances to the established finish grade before pavement replacement.
  2. Construct in accordance with the details as shown on the Drawings.
  3. Replace all surface courses, and base courses to match the grade, cross-section, and thickness of existing, except:
    - a. Comply with the minimum thickness as specified herein.
- B. Base courses:
  1. Use existing temporary aggregate pavement material installed during trench backfilling as aggregate base.
  2. Remove portion of the existing temporary aggregate pavement material necessary to install base, binder and surface courses.
    - a. Scarify, grade, and shape the aggregate base courses.
    - b. Place and compact additional material as directed by the Engineer.
  3. Reuse the removed temporary pavement material for any of the following:
    - a. Trench backfill or bedding.
    - b. Temporary pavement at another location.
    - c. Fill material for subgrade removal and replacement.
    - d. Subbase granular material or aggregate base course if the Engineer determines that there is not significant segregation or contamination of the material and if it is constructed as specified in these Specifications.

### 3.4 PRIME COATS

- A. Bituminous prime coat:
  1. Apply prime coat to all aggregate base courses prior to installation of asphalt binder courses at a minimum rate of 0.40 gallons per square yard.
    - a. Apply prime coat to saw-cut edges of existing pavement or driveway that abuts trench limits, by hand swabbing, if necessary.
    - b. Prime may be eliminated between new binder and surface courses only when surface course is applied immediately after binder course, when binder has cooled to the appropriate temperature.
    - c. Apply prime coat to new binder course if traffic has been allowed on binder course prior to installation of surface course at a rate of 0.10 gallons per square yard.

2. Do not apply when ambient temperature is less than as specified by IDOT Section 406, or when local conditions indicate that rain is imminent.

### 3.5 SURFACE COURSES

- A. Hot-mix asphalt binder courses and surface courses:
  1. Install hot-mix asphalt binder with a minimum thickness of 2½ inches and hot-mix asphalt surface courses with a minimum thickness of 1¾ inches to attain a minimum total thickness of 4¼ inches.
    - a. Install binder and surface course with greater thicknesses if so indicated on the Drawings.
  2. Repair settled trenches, spalled asphalt, and other defective binder before placement of hot-mix asphalt surface course.
  3. Resaw-cut edges of trench limits, if necessary, to provide a clean-straight edge prior to installation of hot-mix asphalt surface course.

### 3.6 STRUCTURE ADJUSTMENT

- A. Comply with applicable articles of Section 603 of IDOT "Standard Specifications" for materials and installation except as modified below:
  1. Do not use steel, ductile iron, or cast iron adjusting rings.
  2. Do not use common brick.
- B. Provide watertight joints between concrete adjusting rings, frame, and structure when adjusting sanitary sewer manhole frames.

END OF SECTION



SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide chain link fences and gates as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. General dimensions, manufacturer's specifications, recommended installation procedures, and concrete footing details.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Fence framework, fabric, and related accessories to be a complete system as specified herein.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide fencing and gates with overall height of 72 inches above grade.
  - 1. Height and shape of framework of new fence to match height and shapes of existing fence.

CHAIN LINK FENCES AND GATES

32 31 13-1 (120511.40)

## 2.2 FABRIC

- A. Two-inch diamond weave mesh of 9 gauge aluminum coated steel wire conforming to Standard Specifications ASTM A491.

## 2.3 FRAMEWORK

- A. Roll formed steel sections with 2.0 ounces of hot-dipped zinc coating conforming to ASTM A123, or Type I steel pipe, or Type II steel pipe.
  - 1. Type I: Schedule 40 steel pipe with 2.0 ounces of hot-dipped zinc coating conforming to ASTM A-120.
  - 2. Type II: Pipe manufactured from steel conforming to ASTM A569, cold-formed, high frequency welded, and having a minimum yield strength of 50,000 psi. External surface triple coated with 1.0 ounce  $\pm$ 0.1 ounce of zinc per square foot, 30  $\pm$ 15 micrograms of chromate per square inch and 0.5  $\pm$ 0.2 mils of clear cross linked polyurethane. Internal surface coated, after welding, with a zinc-rich based organic coating having a 91 percent zinc powder loading capable of providing galvanic protection.
- B. Line posts:
  - 1. 1-5/8-inch x 1-7/8-inch roll formed steel C-section weighing 2.28 pounds per foot, or 2½-inch O.D. Type I steel pipe weighing 3.65 pounds per foot, or 2½-inch O.D. Type II steel pipe weighing 3.12 pounds per foot.
- C. Top and brace rails:
  - 1. 1-5/8-inch x 1-1/4-inch roll formed steel C-section weighing 1.37 pounds per foot, or 1-5/8-inch O.D. Type I steel pipe weighing 2.27 pounds per foot, or 1-5/8-inch O.D. Type II steel pipe weighing 1.84 pounds per foot.
- D. Terminal posts and gate posts for single swing gates or one leaf of double gates up to 6 feet leaf width:
  - 1. 3½-inch x 3½-inch roll formed steel section weighing 4.85 pounds per foot, or 3-inch O.D. Type I steel pipe weighing 5.79 pounds per foot, or 3-inch O.D. Type II steel pipe weighing 4.64 pounds per foot.
- E. Gate posts for single swing gates or one leaf of double gates with leaf width of 6 feet to 13 feet:
  - 1. 4-inch O.D. Type I steel pipe weighing 9.11 pounds per foot, or 3½-inch O.D. Type II steel pipe weighing 5.71 pounds per foot.

## 2.4 GATES

- A. Frame assembly of 2-inch O.D. Type I or Type II steel pipe with welded or steel fitted corners. Provide braces and trusses where necessary.
- B. Heavy duty hinges and positive type latching device suitable for padlocking.

- C. Center plunger rod with double latch and catch, and semi-automatic outer catches for drive gates.
- D. Fabric to match fence.

## 2.5 FITTINGS

- A. Pressed steel, cast iron, or cast aluminum post caps to exclude moisture.
- B. Pressed steel, cast iron, or cast aluminum rail and brace ends.
- C. 6-inch minimum length top rail couplings at maximum 20 feet on centers.
- D. Steel tension bars, tension bands, and brace bands.
- E. 3/8-inch steel truss rods with turnbuckles.
  - 1. End, corner, pull and gate posts braced and trussed to line posts.
- F. 7-gauge aluminum coated steel tension wire conforming to ASTM A824.
- G. 9-gauge aluminum tie wires spaced at maximum of 24 inches.
- H. 11-gauge steel wire hog rings with minimum zinc coating of 0.80 ounces per square feet of wire surface.

## 2.6 ACCEPTABLE MANUFACTURERS

- A. Allied Tube & Conduit Fence Division/Grinnell.
- B. Century Fence Company.
- C. Cyclone Fence/United States Steel Corp.
- D. Anchor Fence, Inc.
- E. Or equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Installation by experienced fence erectors.
- B. Conform to ASTM F567.
- C. Space line posts at even intervals not exceeding 10 feet.

- D. Set all posts to a minimum depth of 36 inches in a concrete foundation.
  - 1. 10-inch diameter foundation for line posts.
  - 2. 12-inch diameter foundation for terminal posts.
  
- E. Cast steel pipe sleeve recessed in 18-inch by 18-inch by 6-inch thick concrete pad for retaining gate in closed position.

END OF SECTION

SECTION 32 92 00.19  
LAWNS AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide topsoil, sodding, and care of grass during establishment period for a complete surface restoration of lawns, parkways, and other areas disturbed as a result of the construction.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Conditions of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. Provide a mixture of black dirt having at least 90 percent passing a No. 10 sieve, free of large roots, brush, sticks, weeds, and stones larger than ¼" in diameter, and any other debris.

2.2 AGRICULTURAL LIMESTONE

- A. Provide agricultural-grade ground limestone, ground sufficiently fine so that at least 80% will pass through a No. 8 sieve, containing not less than 80% calcium carbonate equivalent. Moisture content at time of delivery not exceeding 8%.

2.3 FERTILIZER

- A. Provide commercial grade fertilizer, having nutrient content of 16% nitrogen, 6% phosphorus, and 24% soluble potash.

2.4 TEMPORARY EROSION CONTROL MATERIALS

- A. Comply with Section 31 25 00 of these Specifications.

2.5 SOD

- A. Provide field or nursery grown sod that is native to the locality of the Project.
- B. Provide sod that will not break, crumble or tear during handling and placing, free of stones, crab grass, noxious weeds, and other objectionable plants or substances injurious to plant growth.
- C. Provide sod having at least 1-inch of soil adhering firmly to the roots and cut in rectangular pieces with the shortest side not less than 12 inches. At the time of cutting sod, mow the grass height not less than 2 inches nor more than 4 inches.
- D. Do not use sod cut for more than 48 hours prior to placement.

PART 3 - EXECUTION

3.1 TOPSOIL PLACEMENT

- A. Scarify the compacted subgrade to a depth of 3 inches to receive the topsoil.
- B. Spread at least 4 inches of prepared topsoil in areas of new grading raked smooth and level.
- C. Grade flush with walks, curbs, and paving.

3.2 PREPARATION FOR SODDING

- A. Do not start preparation until all other site and utility work and finished grading within the areas to be sodded have been completed.
- B. Till topsoil to a depth of at least 3 inches and smooth out all surface irregularities resulting therefrom. Leave area free of rocks or hard soil clods which will not pass through the tines of a standard garden rake.
- C. Take a test of the site soils to determine the need for application of agricultural limestone (soil pH less than 7.0). If agricultural limestone is needed, then at least 7 days before applying fertilizer, spread lime uniformly in sufficient quantity to produce in the soil a pH of 7.0. Work lime thoroughly into topsoil to a depth of 3 inches.

- D. Apply fertilizer uniformly at a rate of 7 pounds per 1,000 square feet.
  - 1. Work fertilizer into soil prior to sodding.

### 3.3 SODDING

- A. Provide sod in developed areas that were grassed prior to construction and as indicated on the Drawings. Sodding shall also be used in ditches and drainage swales and on all embankment slopes steeper than 3 to 1.
- B. Place sod with the edges in close contact and alternate courses staggered. Lightly tamp or roll to eliminate air pockets. On slopes 2 to 1 or steeper, stake sod with not less than 4 stakes per square yard and with at least one stake for each piece of sod. Stakes shall be driven with the flat side parallel to the slope. Do not place sod when the ground surface is frozen or when air temperature may exceed 90 degrees F. Water the sod thoroughly within 8 hours after placement and as often as necessary to become well established.
- C. In ditches, the sod shall be placed with the longer dimension perpendicular to the flow of water in the ditch. On slopes, starting at the bottom of the slope, the sod shall be placed with the longer dimension parallel to the contours of the ground.
- D. All exposed edges of sod shall be buried flush with the adjacent turf.

### 3.4 WATERING

- A. Immediately begin watering and continually keep moist until the sod has firmly knit itself to the topsoil.

### 3.5 PROTECTION OF WORK

- A. Protect newly sodded areas from all traffic by erecting temporary fences and signs. Protect slopes from erosion. Properly and promptly repair all damaged work when required.

### 3.6 APPLICATION OF FERTILIZER

- A. Six weeks after completion of sodding apply granular fertilizer over all areas at the rate of 2 pounds of nitrogen nutrients per 1,000 square feet of area.

### 3.7 CLEAN-UP

- A. At the time of final inspection of work, but before final acceptance, remove from sodded areas all debris, rubbish, excess materials, tools, and equipment.

### 3.8 MAINTENANCE

- A. Provide watering, mowing, and replanting and continue as necessary until a close healthy stand of specified grasses is established.

- B. Replace lawns not showing a close uniform stand of healthy specified grasses at the end of the guaranty period and maintain until acceptance.

END OF SECTION



## SECTION 33 05 13

## MANHOLES AND STRUCTURES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Provide manholes and structures as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS – Reserved.

1.3 QUALITY ASSURANCE – Reserved.

## 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

## 2.1 GENERAL

- A. Provide precast reinforced concrete manhole sections, bottoms, and cones complying with ASTM C478 or reinforced concrete pipe sections complying with ASTM C76, unless otherwise indicated on the Drawings.
  - 1. Use eccentric cone section for manholes, unless otherwise indicated on the Drawings.
  - 2. Provide precast reinforced concrete monolithic base for manholes.
  - 3. Provide the following on manholes.
    - a. External frame seal.
    - b. Manhole exterior joint protection.
    - c. Manhole exterior surface treatment.

## MANHOLES AND STRUCTURES

33 05 13-1 (120511.40)

- B. Concrete:
1. Provide 4,000 psi concrete using Type I Portland Cement complying with ASTM C150.
- C. Mortar:
1. Mix one part Portland Cement to three parts fine aggregate.
- D. Joints for precast sections:
1. Provide tongue and groove joints with either flexible watertight rubber gaskets or preformed bituminous plastic gaskets consisting of a homogeneous blend of refined hydrocarbon resins and plasticizing compound reinforced with inert mineral filler.
    - a. Acceptable preformed gasket products:
      - (1) Henry Company, RAM-NEK.
      - (2) ConSeal Concrete Sealants, Inc., Type CS-102.
      - (3) Or equal.
- E. Steps:
1. Provide steps with a minimum width of 12 inches and a minimum projection of 5 inches.
  2. Use steps consisting of copolymer polypropylene plastic with a continuous ½-inch steel reinforcement as manufactured by M.A. Industries, Inc., or equal.
- F. Frames and covers:
1. Provide ductile iron frames and covers with heavy duty indented top with solid self-sealing lids and machined bearing surfaces, stamped with the word "SANITARY".
    - a. Acceptable products: East Jordan 1050 EXHD, or equal.

## 2.2 FLEXIBLE PIPE CONNECTORS

- A. Provide flexible rubber gasket collar for connecting sanitary sewer pipe to the manhole.
1. Comply with ASTM C923.
  2. For pipe 24-inch and smaller, use PSX gasket system by Press-Seal Gasket Corporation, or equal.

## 2.3 EXTERNAL FRAME SEAL

- A. Provide frame seals consisting of a flexible external rubber sleeve and extension and stainless steel compression bands.
- B. Rubber sleeve and extension:
1. Provide rubber sleeve and extension complying with ASTM C923.
  2. Comply with a minimum 1,500 psi tensile strength, maximum 18 percent compression set and a hardness (durometer) of 48±5.
  3. Provide sleeve with a minimum thickness of 3/16-inch and unexpanded vertical heights of 6 or 9 inches.

4. Provide extension having a minimum thickness of 3/16-inch.
- C. Compression band:
1. Provide compression band to compress the sleeve against the manhole.
  2. Use 16 gauge stainless steel conforming to ASTM A240 Type 304 with no welded attachments and having a minimum width of 1-inch.
  3. Make a watertight seal having a minimum adjustment range of 2 diameter inches.
  4. Provide stainless steel screws, bolts, and nuts conforming to ASTM F593 and 594, Type 304.
- D. Acceptable products:
1. Cretex Specialty Products.
  2. Or equal.

## 2.4 MANHOLE EXTERIOR JOINT PROTECTION

- A. Two piece wrap-around heat shrinkable sleeve system.
1. Minimum width: 9 inches.
  2. Acceptable manufacturer: CANUSA WRAPID SEAL.
- or
- B. Woven polypropylene fabric with rubberized mastic coating and steel strapping.
1. Minimum width: 9 inches.
  2. Acceptable manufacturer: MacWrap.
- or
- C. EPDM (Ethylene Propylene Diene Monomer) external rubber sleeve with 2-inch wide mastic strip on top and bottom edge of sleeve.  
Minimum thickness: 60 mils.  
Minimum width: 8 inches.
1. Mastic: Non-hardening butyl rubber sealant; minimum thickness ¼-inch.
  2. Acceptable products: Infi-Shield External Sealing System, or equal.

## 2.5 MANHOLE EXTERIOR SURFACE TREATMENTS

- A. Damp proofing material: Water based Acrylic coating.
- B. Acceptable manufacturers:
1. ConSeal CS-55, Water Based Acrylic Coating.
  2. Or equal.

## PART 3 - EXECUTION

### 3.1 MANHOLES

- A. General:
1. Shape invert channels to be smooth and semicircular, conforming to the inside of the adjacent sewer section.

2. Make changes in direction of flow with a smooth curve of as large a radius as the size of the manhole will permit.
3. Make changes in size and grade of channels smoothly and evenly.
4. Form the invert channels directly in the concrete of the manhole base, with mortar.
5. Smooth the bench of the manhole outside the channels and slope toward the channels at not less than 1-inch per foot and not more than 2 inches per foot.
6. Provide external chimney seal on all manholes.
7. Provide manhole exterior joint protection on all manholes.
8. Provide manhole exterior surface treatment on all manholes.

### 3.2 STEPS

- A. Provide each manhole with individual wall-mounted steps as shown on the Detail in the Drawings.
  1. Comply with the requirements of governmental agencies having jurisdiction.

### 3.3 JOINTING

- A. Use flexible watertight gaskets for each joint.
  1. Trim smooth and free from surplus gaskets.

### 3.4 FRAMES AND COVERS

- A. Unless otherwise shown on the Drawings or as directed by the Engineer, set frames and covers:
  1. In paved areas: Top of solid cover flush with finished pavement.
  2. In unpaved areas: To drain away from the manhole for solid covers; approximately ½-inch below grade for grate covers.
  3. With flexible watertight gaskets.
  4. With adjusting rings not to exceed 8 inches.

### 3.5 MANHOLE EXTERNAL FRAME SEAL

- A. Install external rubber gasket on the manhole frame and chimney.
  1. Provide watertight gasket to eliminate leakage between the frame and each adjusting ring down to and including cone section.
- B. Clean surface and prepare the lower 2 inches of the manhole frame and exterior of all adjusting rings and cone section/corbel surfaces.
  1. Realign frame on adjusting rings or corbel as required.
- C. Repair and apply mortar grout to the adjusting rings as required to provide a smooth, circular surface for the rubber gasket.
- D. Install rubber gasket in accordance with manufacturer's recommendations.
  1. Field verify for suitable dimensions and layout before installation.
  2. Utilize sealing caulk where required.

- E. Test installation by flooding area around the manhole with water before backfilling and surface restoration.
  - 1. Gaskets are required to provide watertight seal at openings between the frame and adjusting rings and between adjacent adjusting rings down to the cone/corbel section.
  - 2. Reinstall and retest failing gaskets at no additional cost to Owner.

### 3.6 MANHOLE EXTERIOR JOINT PROTECTION

- A. Install exterior joint seals per manufacturer's recommendation.
  - 1. Install in the presence of the Engineer.
  - 2. Comply with manufacturer's recommendations regarding protection of sleeves during backfilling.
  - 3. Apply heat shrink type seals prior to surface treatment of manholes if surface treatment is required.

### 3.7 MANHOLE SURFACE TREATMENTS

- A. Apply surface treatment materials in strict accordance with the manufacturer's recommendations on concrete surfaces to which additional concrete will not be bonded.
- B. For exterior subgrade manhole surfaces, provide a minimum of two coats of damp-proofing material.
  - 1. Apply each coat at a minimum rate of 50 square feet per gallon.
  - 2. Apply only after exterior joint seals are in place.

### 3.8 SANITARY MANHOLE WATERTIGHTNESS TESTING

- A. Vacuum Testing Methods:
  - 1. Test each sanitary manhole for leakage per ASTM C1244-93, no sooner than 30 days after installation.
  - 2. Plug all lift holes with a non-shrink grout.
    - a. Do not place grout in horizontal joints before testing.
  - 3. Seal all inlet and outlet pipes with airtight plugs, taking care to securely brace plugs to prevent the plugs from being drawn into the manhole.
  - 4. Place the vacuum test equipment at the inside top of the cone section and inflate the seal to 40 psi.
  - 5. Draw a vacuum of 10 inches of mercury and shut the vacuum pump off.
  - 6. Close valves and measure the time for the vacuum to drop to 9 inches of mercury.
  - 7. Allowable limits: the manhole shall pass if the time for the vacuum reading to drop from 10 inches to 9 inches exceeds 60 seconds for a 48-inch diameter manhole, 75 seconds for a 60-inch diameter manhole, and 90 seconds for a 72-inch diameter manhole.
  - 8. Repair all manholes failing the initial test with a non-shrink grout.
  - 9. If a manhole fails the initial test, retest until a satisfactory test is obtained.
  - 10. Provide equipment, materials and labor necessary to conduct vacuum testing.

11. Make tests in the presence of the Owner, giving the Owner at least 48 hours notice prior to testing.

END OF SECTION

SECTION 33 32 32.31

SUBMERSIBLE SEWAGE PUMPING EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide submersible sewage pumping equipment as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Detailed drawings for pumps, access hatch, guide rail system, accessories, electrical control panel with schematic wiring diagram and dimensions; head-capacity-horsepower pump curve; manufacturer's detailed specifications and recommended installation procedures.
- B. Operation and Maintenance Manuals – Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts:
  - 1. Provide the following spare parts to the Owner with the equipment:
    - a. Three (3) fuses of each type and rating.
    - b. Six (6) pilot light lamps of each type and rating.
  - 2. Furnish same brands and models as original equipment.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Provide submersible sewage pumping equipment consisting of:
  - 1. Pumps and motors.
  - 2. Electrical power cord and sensor cables.
  - 3. Guide rail system.
  - 4. Access hatch (Triplex).
  - 5. Valve vault sump pump.
  - 6. Pump control system.
- B. Provide pump and motor units which are listed for explosion proof Class I, Division 1, Group D hazardous location in air or submersible in water and sewage.
- C. Operating conditions: Provide pumps to operate at the specified capacities and heads and over the range of operating conditions specified without overloading, cavitation, undue noise and vibration.
  - 1. Furnish the pumps in accordance with the following requirements:
    - a. Rated duty point:
      - (1) Flow: 1,600 gpm.
      - (2) Total dynamic head: 86 feet.
    - b. Secondary duty point:
      - (1) Flow: 1,000 gpm.
      - (2) Total dynamic head: 110 feet.
    - c. Maximum pump speed: 1,770 rpm.
    - d. Maximum motor horsepower: 60 HP.
    - e. Minimum impeller thulet size: 7½ inches.
    - f. Minimum pump discharge size: 6 inches.
- D. Design each pump to have a continuously rising curve from the secondary duty point to shutoff. Design the pump to have curve passing through the primary duty point, and which meets or exceeds the specified heads and capacities, all within the Hydraulic Institute tolerances.
- E. Provide pumping units capable of sustaining full reverse runaway speed without damage.
- F. Provide stainless steel fasteners, bolts, nuts, and washers.
- G. Acceptable manufacturers:
  - 1. Flygt Model NP3202.
  - 2. No substitutions.

### 2.2 PUMPS AND MOTORS

- A. Provide each pump with the following features:
  - 1. Cast iron case.
  - 2. Cast iron, non-clog impeller with replaceable brass or bronze wear ring.



3. Stainless steel shaft and fasteners.
  4. Oil lubricated mechanical seals tandem mounted and seal failure sensor.
  5. Two rows of heavy-duty, permanently lubricated ball bearings to support the shaft and motor rotor and absorb thrust and radial loads.
  6. Discharge connection elbow.
- B. Provide (FM approved, explosion-proof) air or oil-filled motor suitable for continuous operation on 480 volts, 3 phase, 60 Hertz A.C.
1. Equip motor with overheat sensor(s) installed in the motor windings.
  2. Design motor to be non-overloading throughout the pump capacity-head curve.

### 2.3 ELECTRICAL POWER CORD AND SENSOR CABLES

- A. Provide suitable length of extra hard usage, water resistant, 600 volt, UL listed and/or FM approved power cord and sensor cable(s) for each pump with:
1. Leak-proof, torque free seal at cable entry to motor.
  2. Sealing of the motor power cord and sensor cable(s) to prevent moisture entry into the motor due to wicking or capillary action through the cable.
  3. Corrosion-resistant cable supporting means.
  4. Provide minimum cable lengths of 60 feet per pump.

### 2.4 GUIDE RAIL SYSTEM

- A. Provide two-rail guide system so that the entire pump and motor assembly can be easily removed from the pumping chamber without requiring removal of nuts, bolts, or other mechanical fasteners consisting of:
1. Stainless steel guide rails.
  2. Upper and lower guide rail pipe holders.
  3. Intermediate guide rail bracket(s) if required.
  4. One full length stainless steel lift chain.
  5. Lift chain hook.
  6. One forged "grip eye" of wrought alloy steel for use with a mechanical lifting device, 3 feet of stainless steel lift chain, a 1/4" stainless steel "grip eye" guide cable, and a 3/16" stainless steel "grip eye" release cable as the pump lifting system.

### 2.5 ACCESS DOORS

- A. Provide access doors reinforced for AASHTO HL-93 truck load as shown on the Drawings, as sized by the pump manufacturer, and with the following features:
1. Comply with the requirements of Section 08 31 23.
  2. Provide triplex hatch to fit on proposed 10'-0" inside diameter wet well.

## 2.6 VALVE VAULT SUMP PUMP

- A. Provide a submersible sump pump capable of discharging 20 gpm at 16 feet TDH, cast iron body complete with close-coupled oil-filled motor with thermal overload protection, pressure switch with piggyback plug-in arrangement for operation on 120 volt, single phase, 60 Hertz A.C. power source.

## 2.7 PUMP CONTROL SYSTEM

- A. Provide a pump control system consisting of wet well level sensing float switches (to serve as a backup to pressure transducer) and an electrical control panel to be mounted inside a pumping station electrical enclosure as shown on the Drawings.
- B. Wet well level sensing float switches:
  - 1. Provide float switches for "pump off", "lead pump on", "lag pump on and lead pump off", and "high water level".
    - a. Acceptable manufacturers:
      - (1) Flygt ENH-10.
      - (2) Or equal.
  - 2. Provide a stainless steel cable or chain with 10-pound cast iron weight for float switch support.
- C. Electrical control panel:
  - 1. Provide the following controls for each pump:
    - a. A thermal magnetic three-pole circuit breaker with UL listed short circuit ratings of 10,000 RMS symmetrical amps for up to 240 volts and 14,000 RMS symmetrical amps for up to 480 volts.
    - b. Across-the-line NEMA rated magnetic starter, NEMA 1 minimum size, minimum short circuit withstand rating in combination with motor circuit protective device of 10,000 symmetrical amps, with NEMA Class 10 overload relay with reset button and thermal overload elements in each phase sized per motor nameplate FLA rating.
    - c. Hand-off-automatic selector switch: Oil-tight, NEMA 4 rated.
    - d. Indicating pilot lights: Oil-tight, NEMA 4 rated, green "run", red "seal failure", and red "overheat" of 120 volt, push-to-test type.
    - e. Manual reset button for pump failure (overheat).
    - f. Seal failure sensor unit.
    - g. Running time meter: Six-digit, non-resettable, registered in hours and tenths of hour.
    - h. Wiring terminal board.
  - 2. Provide the following additional control functions and components:
    - a. Single phase control transformer with 480-volt primary and 120 volt secondary windings.
    - b. Automatically switch primary power for control transformer from deactivated pump circuit breaker to active circuit breaker.
    - c. Means for independent manual pump selection and automatic alternation of pumping sequence.
    - d. Three-position selector switch (1-2/2-3/1-3) to determine which two of three pumps can operate on the generator.

## SUBMERSIBLE SEWAGE PUMPING EQUIPMENT

33 32 32.31-4 (120511.40)

- e. Pilot light (red) for "high water level" indication: Oil-tight, NEMA 4 rated.
  - f. Intrinsically safe barriers for float switches and intrusion limit switches.
  - g. Dry contacts to activate remote alarm circuits when in the "high water level", "pump failure (overheat)", and "intrusion" conditions.
  - h. A thermostatically controlled strip heater with thermal magnetic circuit breaker.
  - i. A 20 amp, single pole thermal magnetic circuit breaker for a remote duplex receptacle.
  - j. A 15 amp, single pole thermal magnetic circuit breaker for valve vault sump pump.
  - k. Phase motor protector connected to incoming line with fuse protected leads to open pump control circuit when phase loss, under voltage, or phase reversal occur.
3. Prewire the controls at the factory and provide clearly labeled screw terminals and lugs for field connections of pump cables, float switch cables, convenience receptacle, alarm light, remote alarm circuit, and feed from the electrical service switch.

## 2.8 PAINTING

- A. Comply with the pertinent provisions of Section 09 90 00.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install equipment in accordance with manufacturer's recommendations.

### 3.2 FIELD QUALITY CONTROL

- A. Conduct field test prior to energization as follows:
  - 1. Megger check wire insulation levels (do not megger check solid-state equipment).
  - 2. Record and provide results of tests to Engineer.
- B. Test submersible sewage pumping equipment and alarms for proper operation.

END OF SECTION



SECTION 40 91 19.29

LIQUID PRESSURE PROCESS MEASUREMENT DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide liquid pressure process measurement devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals: Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 PRESSURE INDICATOR TRANSMITTER

- A. Design pressure/level indicator transmitter to sense and transmit water pressure/level.

- B. Provide pressure transmitter with the following requirements:
1. Transducer to be an integrated circuit sensor type with true gauge pressure reading by venting of reference side of sensor to atmosphere.
  2. Primary fill-fluid: Silicone 200.
  3. Diaphragm material: 316 stainless steel.
  4. Process Connection: ½" NPT.
  5. Mounting bracket: 1¼" to 2" pipe or surface mounting as required.
  6. Integral indicator: Local indicator with minimum 3½ digit LCD meter.
  7. Damping: Adjustable up to 15 seconds minimum.
  8. Adjustment: Integral zero and span adjustments.
  9. Power Supply: Loop power 24 Vdc.
  10. Output: 4-20 mAdc.
  11. Transient protection as required.
  12. Block and bleed manifold.
  13. Enclosure: NEMA 4X.
- C. Provide remote diaphragm seals with the following requirements:
1. Fluid: Silicone 200.
  2. Diaphragm size: 4-inch, 316 stainless steel.
  3. Capillary: 316 stainless steel armor capillary.
- D. Provide pressure sensor isolator ring (instrument protector) as required to comply with Section 22 19 26.
- E. Acceptable manufacturers:
1. Rosemount, Model 2088.
  2. Siemens, Sitrans P.
  3. Endress + Hauser, Cerabar.
  4. Or equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install equipment in accordance with manufacturer's recommendations.

### 3.2 CALIBRATION

- A. Calibrate and program equipment to meet system requirements.

### 3.3 START-UP AND TESTING

- A. Comply with the manufacturer's recommended testing procedures.

END OF SECTION

SECTION 40 91 23.33

FLOW PROCESS MEASUREMENT DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide flow process measurement devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals: Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 ELECTROMAGNETIC FLOW METERS

- A. Design electromagnetic flow meters to measure the flow rate of conductive liquid in pipes using the principle of Faradays law.

FLOW PROCESS MEASUREMENT DEVICES

40 91 23.33-1 (120511.40)

- B. Provide electromagnetic, micro processor-based flow meters with the following requirements:
1. Transmitter:
    - a. Power supply: 24 VDC or 120 VAC as shown on the Drawings.
    - b. Output: Isolated 4-20 mA<sub>dc</sub> and pulse configurable for set volume per pulse.
    - c. Display: Alphanumeric LCD displaying flow rate and totalized flow.
    - d. Adjustment: Field programmable by keypad entry.
    - e. Operating temperature: -4 to 120 degrees F.
    - f. Enclosure: NEMA 4X.
    - g. Mounting: Integral or Remotely mounted as shown on the Drawings.
    - h. Utilizes high impedance circuitry.
    - i. Low flow cut-off of 1% of full-scale flow.
  2. Transducer:
    - a. Design: Permanent submergence Pulsed DC Magnetic type, measures bi-directional flow, and automatic adjustment of sensitivity to match flow velocities.
    - b. Submersible cable(s) factory-sealed at the transducer and routed continuously without splices to transmitter for remote-mounted transmitters.
    - c. Flow range: 1 fps to 30 fps.
    - d. Ambient temperature: -4 to 120°F.
    - e. Tube: Min. carbon steel, 150# ANSI steel flanges end connections.
    - f. Liner: Per manufacturer's recommendations for application.
    - g. Electrodes: 316 stainless steel.
      - (1) Provide removable or electrode cleaning system in applications where electrodes may be coated and require periodic cleaning.
    - h. Submergence protection: NEMA6P or IP68.
    - i. Sealed, welded housing with separate electrode compartment
  3. Provide the following accessories:
    - a. NEMA 4X Instrument Enclosure in compliance with Section 40 95 15 for transmitter mounting when mounted outside as shown on the Drawings.
    - b. AC power lines noise filter and voltage surge protector as required.
    - c. Two (2) 316 stainless steel lining protectors or grounding rings, or grounding electrode.
    - d. Cleaning unit as required if non-removable electrodes are provided.
  4. Acceptable manufacturers:
    - a. Rosemount Model 8705 with 8712D (Remote mounted transmitter) or 8732C (Integral mounted transmitter).
    - b. Siemens Sitrans F M MAGFLO Series with MAG5000.
    - c. Endress + Hauser ProMag 53W.
    - d. Or equal.



EXECUTION

3.1 INSTALLATION

- A. Install flow process measurement devices in accordance with manufacturer's recommendations.

3.2 CALIBRATION

- A. Calibrate and program equipment to meet system requirements.

3.3 START-UP AND TESTING

- A. Comply with the manufacturer's recommended testing procedures.

END OF SECTION



SECTION 40 91 23.36

LEVEL PROCESS MEASUREMENT DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide level process measurement devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
  - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
  - 1. Manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals: Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

## PART 2 - PRODUCTS

### 2.1 HYDROSTATIC LEVEL TRANSMITTER

- A. Design hydrostatic level transmitter to sense and measure the head-pressure imposed on its bottom diaphragm by the height of liquid above it, then process and convert this signal electronically to analog signal proportional to level.
- B. Provide hydrostatic level transmitter with following requirements:
  - 1. Head-pressure sensing type suitable for continuous submergence.
  - 2. Range: As required for application.
  - 3. Operating data:
    - a. Operating temperature range: -40 to 248°F.
    - b. Compensated temperature range: 32 to 122°F.
    - c. Overpressure: 300% of range.
  - 4. Power: Loop powered.
  - 5. Output: 4-20mA dc.
  - 6. Accuracy: +/- 0.25% of FS.
  - 7. Construction: 316 stainless steel housing with Viton or stainless steel diaphragm, stainless steel bolts and nuts.
  - 8. Electrical connection: Shielded cable suitable for continuous submergence with polyethylene jacket.
  - 9. Provide the following accessories as required:
    - a. Cable support system.
    - b. Surge Protection.
    - c. NEMA 4X cable box for with following requirements:
      - (1) Cable glands located at the base of enclosure.
      - (2) Desiccant drying cartridge.
      - (3) Vent tube filter or micro filter located at base of enclosure (GORE-TEX).
  - 10. Approvals:
    - a. FM approved IS for Class I, Division I, Groups A-G.
  - 11. Acceptable manufacturers:
    - a. Blue Ribbon Bird Cage.
    - b. Wika – Model LS-10 with stainless steel level guard.
    - c. Sigma Controls – Model 6100 with stand off.
    - d. Or equal.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install equipment in accordance with manufacturer's recommendations.

### 3.2 CALIBRATION

- A. Calibrate and program equipment to meet system requirements.

3.3 START-UP AND TESTING

- A. Comply with the manufacturer's recommended testing procedures.

END OF SECTION

