



AGENDA ITEM EXECUTIVE SUMMARY

Agenda Item:	Water Treatment Facility Variable Frequency Drive Installation for Reverse Osmosis Units		
Presenter & Title:	Bob Van Gyseghem, Superintendent of Water & Wastewater		
Date:	November 1, 2021		
Please Check Appropriate Box:			
<input checked="" type="checkbox"/>	Committee of the Whole Meeting	<input type="checkbox"/>	Special Committee of the Whole Meeting
<input checked="" type="checkbox"/>	City Council Meeting	<input type="checkbox"/>	Special City Council Meeting
<input type="checkbox"/>	Public Hearing	<input type="checkbox"/>	Other -
Associated Strategic Plan Goal/Objective: EMSII, ESII			
Estimated Cost: \$31,350.00	Budgeted?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Other Funding? <input type="checkbox"/> Yes <input type="checkbox"/> No
Executive Summary:			
<p>On June 21, 2021 the City Council approved the purchase of two new Variable Frequency Drives for the Water Treatment Facility. The new VFD's are physically larger in size which requires increasing the size of the concrete pad the units sit on, and the installation of new electric conduit and wiring. The installation phase was placed out to bid and two bids were received on October 11, 2021. The low bid was provided by Newcastle Electric Inc., Itasca, IL in the amount of \$28,500.00. A 10% contingency is recommended to be included in the overall not-to-exceed amount to account for any unforeseen field changes that may occur. Any field changes (Change Orders) require approval by the City Administrator.</p>			
Attachments: <i>(please list)</i>			
<ul style="list-style-type: none"> • Resolution • Bid Summary 			
Voting Requirements:			
<p><i>This motion requires a simple majority of affirmative votes for passage.</i></p> <p><i>The Mayor may vote on three occasions: (a) when the vote of the aldermen or trustees has resulted in a tie; (b) when one half of the aldermen or trustees elected have voted in favor of an ordinance, resolution, or motion even though there is no tie vote; or (c) when a vote greater than a majority of the corporate authorities is required by state statute or local ordinance to adopt an ordinance, resolution, or motion.</i></p>			
Recommendation / Suggested Action: <i>(how the item should be listed on agenda)</i>			
<p>Recommend approval of a Resolution authorizing the City Administrator to execute a contract with Newcastle Electric, Inc. at a cost of \$28,500 and authorize the City Administrator to approve up to \$2,850.00 in change orders for a total not-to-exceed amount of \$31,350.00</p>			

RESOLUTION NO. 2021-96

**RESOLUTION AUTHORIZING EXECUTION OF
Contract for Installation of Reverse Osmosis Variable Frequency Drives**

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF GENEVA, KANE COUNTY, ILLINOIS, as follows:

SECTION 1: That the City Administrator is hereby authorized to execute, on behalf of the City of Geneva, a contract with Newcastle Electric Inc., for the installation of variable frequency drives at water treatment facility.

SECTION 2: This Resolution shall become effective from and after its passage as in accordance with law.

PASSED by the City Council of the City of Geneva, Kane County, Illinois, this 15th day of November, 2021.

AYES: __ NAYS: __ ABSENT: __ ABSTAINING: __ HOLDING OFFICE: __

Approved by me this 15th day of November, 2021.

Mayor

ATTEST:

City Clerk

SECTION 00400

AGREEMENT

WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2
CITY OF GENEVA
2021

This Agreement, made this 15th day of November, 2021 by and between the City of Geneva, hereinafter called "Owner", and Newcastle Electric, Inc., doing business as a Corporation, hereinafter called "Contractor."

Witnesseth: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The Contractor will commence and complete the construction of the **Water Treatment Plant VFD Replacement – Phase 2.**
2. The Contractor will furnish all of the material, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the Project described herein.
- I. The Contractor will commence the work required by the Contract Documents within ten (10) calendar days after the date of the Notice to Proceed. The Contractor will Substantially Complete the Work **60 Days** after the Notice to Proceed and will meet Final Completion **90 Days** after the Notice to Proceed, unless the period for completion is extended otherwise by the Contract Documents.
4. The Contractor agrees to perform all of the Work described in the Contract Documents and comply with the terms therein for the sum of \$28,500.00 as shown in the Bid Form - Section 00300.
5. The term "Contract Documents" means and includes the following:
 - A. Advertisement for Bids
 - B. Instructions for Bidders
 - C. Bid Form
 - D. This Agreement
 - E. Notice of Award
 - F. Notice to Proceed
 - G. Change Order Form
 - H. Performance Bond
 - I. Payment Bond
 - J. Certificates of Insurance
 - K. Certifications (various)
 - L. Specifications prepared or issued by Deuchler Engineering Corp.
 - M. Drawings prepared by Deuchler Engineering Corp.

N. Addenda:

- No. _____, dated _____, 2021

O. Any modification, including Change Orders, duly delivered after execution of Agreement.

- 6. The Owner will pay to the Contractor in the manner and at such times as set forth in the Special Provisions, such amounts as required by the Contract Documents.
- 7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.
- 8. 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 above, plus any extensions thereof allowed in accordance with the Contract Documents. The Contractor also recognizes the difficulties involved in proving the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Contractor shall pay the cost of engineering time, construction observation time, construction management time and any other costs associated with such delay for each day that expires after the time specified in paragraph 3 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 time specified in paragraph 3 for completion and readiness for final payment, contractor shall pay the cost of engineering time, construction observation time, construction management time and any other costs associated with such delay for each day that expires after the time specified in paragraph 3 for completion and readiness for final payment.

In witness whereof, the parties hereto have executed or caused to be executed by their duly authorized officials this Agreement in **quadruplicate** each of which shall be deemed an original on the date first above written.

Owner:

City of Geneva

By: Stephanie K. Dawkins

Name: Stephanie K. Dawkins

Title: City Administrator



Attest:

Name: Jeanne Loran

Title: Deputy Clerk

Contractor:

Newcastle Electric, Inc.

By: Shirley Maloney

Name: Shirley Maloney

Title: President

(Seal)

Attest:

Name: Shirley Maloney

Title: SECRETARY

Newcastle Electric, Inc.

Contractor's Name:

PROJECT NO. 190-19090-00

Address/ City, State: 1505 Industrial Dr., Itasca, IL 60143

Telephone: (630) 773-0171

Fax:

Contract Documents

For

WATER TREATMENT PLANT VFD REPLACEMENT - PHASE 2



2021

<p>JOHN W. FRERICH 062-053255 REGISTERED PROFESSIONAL ENGINEER ILLINOIS</p>	<p>DEUCHLER ENGINEERING CORPORATION 184-001030 PROFESSIONAL DESIGN FIRM CORPORATION STATE OF ILLINOIS AURORA, ILLINOIS</p>
DATE: 9/23/2021 EXP: 11/30/2021	DATE: 9/23/2021 EXP: 4/30/2023
JOHN W. FRERICH, P.E. DEUCHLER ENGINEERING CORP. PROFESSIONAL ENGINEER 062-053255	DEUCHLER ENGINEERING CORP. PROFESSIONAL DESIGN FIRM CORPORATION
RESPONSIBLE FOR ALL DRAWINGS AND SPECIFICATIONS	

Deuchler Engineering Corp.

230 Woodlawn Avenue

Aurora, IL 60506

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CITY OF GENEVA
WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2

BIDDING DOCUMENTS

Deuchler Engineering Corp.
190-19090-00

SECTION 00020

ADVERTISEMENT FOR BIDS

**WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2
CITY OF GENEVA
2021**

Sealed **Bids** submitted in duplicate in a sealed envelope with the words “Water Treatment Plant VFD Replacement – Phase 2” clearly marked on it, will be received by the City of Geneva, Illinois until **10:00 A.M. Monday, October 11, 2021** at the office of the City Administrator, 22 South First Street, Geneva, IL, 60134 and will be publicly opened and read aloud at that time. The proposed project consists of the removal of two existing variable frequency drives (VFDs) and installation of two new VFDs (already purchased and located on site) along with new wiring, conduit, and associated civil and electrical work for a complete and operational system.

A **site visit** for all General Contractors interested in submitting a bid proposal will be held on **Thursday, September 30, 2021 at 10:00 A.M.** at the Water Treatment Facility which is located at 4000 Keslinger Road, Geneva, IL 60134. No other individual site visits will be permitted.

The Contractor and sub-Contractors shall pay not less than the current prevailing wages at the time of the signing of the contract as found by the Department of Labor or as determined by the Court of Appeal, to all his/her employees performing work under the Contract. A signed certification stating the above as well as the fact that the bidder is not barred from bidding as a result of a violation of either Section 33E-3 or 33E-4 of Chapter 38, Illinois Revised Statutes, 1987 (as amended) must be submitted by the successful bidder as part of this contract.

A digital copy of Instructions for Bidders, Bid Form, Plans, and Specifications is available on the City of Geneva website: <https://www.geneva.il.us/>

All **Bids** shall be submitted in accordance with the Instructions for Bidders and shall be accompanied by a **10% Bid** guarantee consisting of a bid bond, as provided for under terms of said Instructions for Bidders and Specifications. Complete instructions for filing **Bids** are included in the Instructions for Bidders. The City reserves the right to reject any or all **Bids** and waive technicalities.

Dated this 24th day of September, 2021

SECTION 00100
INSTRUCTIONS FOR BIDDERS

WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2
CITY OF GENEVA
2021

Certain additional terms used in these Instructions for Bidders have the meanings indicated below which are applicable to both the singular and plural thereof.

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

Issuing Office - the office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.

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

Article 1. Qualifications of Bidders

- 1.1 To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five days after Bid opening, upon Owner's request, detailed written evidence such as financial data, previous experience, present commitments, and other such data as may be called for. **Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the contract.**

The investigation of a Bidder will seek to determine whether the organization is adequate in size, has had previous experience and whether available equipment and financial resources are adequate to assure Owner that the Work will be completed in accordance with the terms of the Agreement. The amount of other work to which the Bidder is committed may also be considered.

- 1.2 In evaluating Bids, Owner will consider the qualifications of only those Bidders whose Bids are in compliance with the prescribed requirements.
- 1.3 Owner reserves the right to reject any Bid if the evidence submitted by, or the investigation of, such Bidder fails to satisfy Owner that such Bidder is properly qualified to carry out the obligations of the Contract Documents and to complete the Work contemplated therein.
- 1.4 Owner may consider the qualifications and experience of Subcontractors and other persons and organizations (including those who are to furnish the principal items of material or

five (5) days before the date set herein for the opening of bids. Questions received by the Engineer less than five (5) business days prior to the date for opening of Bids will not be answered.

- 4.2 Written clarifications or interpretations will be issued by Addenda not later than two days before the bid opening date. Only questions answered by formal written Addenda will be binding. Oral and other clarifications or interpretations will be without legal effect. Addenda will be sent by delivery service with return receipt requested or by FAX, to all parties recorded as having received the Contract Documents.
- 4.3 Bidders are responsible for determining that they have received all Addenda issued.

Article 5. Bid Security

- 5.1 Each Bidder shall deposit with his Bid a Bid guarantee consisting of a **bid bond** executed by the Bidder in an amount not less than **10%** of the total amount of the Bid submitted. 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. The bid security shall act as a guarantee that in case the Bidder's proposal is accepted, the Bidder shall within ten (10) days after the date of such acceptance and notification thereof, deliver to the Owner a contract signed and executed by the Contractor and a responsible bonding company acceptable to and written upon forms prepared or approved by the Owner.

Article 6. Bid Form

- 6.1 Each Bid shall be submitted on the Bid Form on the pages included in the Contract Documents. The Bid Form must be submitted on the color paper provided in the Contract Documents: blue paper for Section 00300, pink paper for the bid security. The remainder of Items 3-4 listed in the Bidder's Checklist on page 9 of Section 00100 may be submitted on white paper. The Bid Form shall be removed and submitted separately. All blank spaces for Bid prices must be filled in with the unit price of the item or the lump sum for which the Bid is made.
- 6.2 Bid Forms shall be completed in ink or by typewriter. The Bid price of each item on the form shall be stated in figures.
- 6.3 Bids by corporations shall 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 shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.
- 6.4 Bids by partnership shall be executed in the partnership name and signed by a partner, whose title shall appear under the signature. The official address of the partnership shall be shown below the signature.
- 6.5 All names shall be typed or printed below the signature.

the requirements of the Plans and Specifications, this would be considered a conditional or qualified bid and the Bid will not be accepted.

Article 9. Performance, Payment and Other Bonds

- 9.1 A Performance Bond and a Payment Bond, each in the amount of 100 percent of the Contract Price, with a corporate surety approved by the Owner will be required for the faithful performance of the contract.
- 9.2 All Bonds required as Contract Security shall be furnished with the executed Agreement.
- 9.3 Attorneys-in-fact who sign Payment Bonds and Performance Bonds must file with each Bond a certified and effective dated copy of their power of attorney.

Article 10. Award of Contract

- 10.1 The Contract will be awarded to the lowest responsive, responsible and eligible Bidder (Successful Bidder) for the project determined by the Owner to be in the Owner's best interest.

Responsive Bidders will provide bids for the unit or lump sum price for each item set forth on the Bid Form, and for each alternate project feature addition. Responsive Bidders may also provide bids for each alternate equipment manufacturer listed as described in the Bid Form and selected by the Bidder.

The term "lowest responsive, responsible and eligible Bidder" as used herein shall mean the Bidder whose Bid is the lowest of those Bidders possessing the skill, ability and integrity necessary to the faithful performance of the Work, and submits a Bid meeting all requirements.

- 10.2 The Contract will be awarded on the basis of material and equipment described in the Contract Documents without consideration of possible substitute or "or equal" items. Whenever it is indicated in the Contract Documents that a substitute or "or equal" item of material or equipment may be furnished or used by the Bidder, if acceptable to the Engineer, application for such acceptance will not be considered by the Engineer until after the "effective date of the Agreement."
- 10.3 Owner reserves the right to reject any and all Bids, to waive any and all informalities if it is in Owner's best interest to do so, and the right to disregard all nonconforming, nonresponsive or conditional Bids.
- 10.4 Owner also reserves the right to reject the Bid of any Bidder that Owner considers to be unqualified relative to Article 1 above.
- 10.5 If the Contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within 5 days, after the actual date of the opening of the Bids.

- 12.3 The Successful Bidder shall have a competent person or persons, as required under the Occupational Safety and Health Act on the Site to inspect the work and to supervise the conformance of the Work with the regulations of the Act.

Article 13. Prevailing Wages for Kane County

- 13.1 The prevailing wage rates from Kane County, Illinois shall apply.

Article 14. Nondiscrimination in Employment

- 14.1 Contracts for work under this Project will obligate the Contractor and Subcontractors not to discriminate in employment practices.
- 14.2 The Contractor assures the Owner that they are an "Equal Opportunity Employer" as defined by Federal and State laws and regulations and agrees to comply with the Illinois Employment Practice Commission Equal Opportunity Clause as required by Article II of the Illinois FEPC Rules and Regulations, which is considered to be part of any contract or purchase agreement.
- 14.3 The Contractor certifies that the firm has a written sexual harassment policy defining sexual harassment as required in Section 2-105 of the IL. Human Rights Act 775 ILCA 5/1-105 et.seq.

Article 15. State Sales Tax

- 15.1 Sales tax will not have to be paid on equipment and material purchased for this project.

Article 16. Liquidated Damages

- 16.1 Provisions for Liquidated Damages are set forth in the Agreement

Article 17. General

- 17.1 The Contract Documents contain the provisions required for the construction of the Project. Information obtained from an officer, agent, employee of the Owner, or any other person shall not affect the risks or obligations assumed by the Contractor, or relieve them from fulfilling any of the conditions of the Contract.
- 17.2 The low Bidder shall submit the names of the major subcontractors (contracts in excess of \$5,000). Failure to comply with this requirement may make the Bidder non-responsive as determined by the Owner. The Owner shall receive the list of the subcontractors by 2:00 P.M., prevailing time, on the day after Bids are received by the Owner, at the offices of the Engineer, Deuchler Engineering Corporation, 230 Woodlawn Avenue, Aurora, IL 60506; FAX (630) 897-5696.
- 17.3 Certification that Contractor is not barred from public contracting due to bid-rigging or bid

**WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2
CITY OF GENEVA
2021**

Bidder's Checklist of Items to Assist with Bid Submittal

1. **Bid Security:** 10% of the Bid, attach to last page of Bid Form Section 00300
2. **Completed Bid Form**
 1. All names filled in appropriate blanks.
 2. Acknowledge receipt of Addenda.
 3. Price Schedule filled out.
 4. Bid Signed by Officers.
3. **Completed Sections 00310, 00315, 00320**
 - a. Drug Free Workplace Certification – Section 00310
 - b. Certification of Compliance with Safety Regulations – Section 00310
 - c. Certification of No Tax Delinquency and No Tax Default – Section 00310
 - d. Certification of Compliance with Sexual Harassment Policies – Section 00310
 - e. Certification of Non-Segregated Facilities – Section 00310
 - f. Anti-Bid Rigging Certification – Section 00315
 - g. Certification of Debarment, Suspension and Other Responsibility Matters – Section 00320
4. **Completed Affidavit of Experience Section 00330**
5. **List of Subcontractors by 2:00 p.m. the day after receipt of bids, Section 00300 - Page 6**
6. **Completed Affidavit of Litigation History Section 00335**

END OF SECTION

SECTION 00300

BID FORM

**WATER TREATMENT PLANT VFD REPLACEMENT - PHASE 2
CITY OF GENEVA
2021**

Proposal of Newcastle Electric Inc (hereinafter called "BIDDER"), organized and existing under the laws of the State of Illinois, doing business as A corporation (insert "A Corporation," "A Partnership," or "An Individual," as applicable) to the City of Geneva (hereinafter called "Owner").

- I. The undersigned BIDDER proposes and agrees, if this bid is accepted, to enter into an agreement with the Owner in the form in the Bidding Documents to perform and furnish all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
- II. BIDDER accepts all of the terms and conditions of the Advertisement for Bids and Instructions for Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that BIDDER may agree to in writing upon request of Owner.
- III. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:
 - A. BIDDER has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

Addendum No.

Addendum Date

_____	_____
_____	_____
_____	_____

- B. BIDDER has visited the site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, performance, and furnishing of the Work.
- C. BIDDER is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

- B. They are not the person in the BIDDER's organization responsible within that organization for the decision as to the prices being bid, but that they have been authorized to act as an 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 (4) above, and as their agent shall so certify; and shall also certify that he has not participated, and will not participate, in any action contrary to (4) above.
- VI. BIDDER does hereby propose to furnish all labor, services, materials, supplies, equipment, apparatus, appliances, and to do all work and pay all costs and expenses connected therewith required to construct this project complete in place in accordance with the documents named in the foregoing paragraph, on the basis of the quantities of work and services actually performed and for the unit and lump sum prices for the several classifications of work stated herein below, which said unit and lump sum prices are as follows:

TWENTY EIGHT THOUSAND FIVE HUNDRED Dollars
(use words)

and ZERO Cents
(use words)

\$ 28,500
Total Base Bid (figures)

NOTES:

1. OWNER RESERVES THE RIGHT TO DELETE ANY BID ITEMS WHICH ARE NOT IN THE BEST INTEREST OF THE OWNER. THE OWNER ALSO HAS THE RIGHT TO REDUCE ANY QUANTITIES IN ORDER TO KEEP THE PROJECT UNDER THE BUDGETED VALUE FOR THE FISCAL YEAR.
2. BIDDER agrees that the Work will be Substantially Complete 60 Days after the Notice to Proceed and will meet Final Completion 90 Days after the Notice to Proceed.
3. BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work on time.
4. The Owner reserves the right to reject all Bids.
5. Accompanying this Bid is a Bid Security in the amount of \$ BID BOND, which is hereby tendered in accordance with the requirements of the Instructions to Bidders and the Specifications.
6. In the event that this Bid is accepted and an award of contract is made to the undersigned

Document A310™ – 2010

Conforms with The American Institute of Architects AIA Document 310

Bid Bond

CONTRACTOR:

(Name, legal status and address)

Newcastle Electric, Inc.
1505 Industrial Drive
Itasca, IL 60143

SURETY:

(Name, legal status and principal place of business)

West Bend Mutual Insurance Company
1900 South 18th Avenue
West Bend, WI 53095
Mailing Address for Notices

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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

OWNER:

(Name, legal status and address)

City of Geneva
22 S. First St.
Geneva, IL 60134

BOND AMOUNT: 10% Ten Percent of Amount Bid

PROJECT:

(Name, location or address, and Project number, if any)

Water Treatment Plant VFD Replacement Phase 2 City of Geneva 2021, 4000 Keslinger Rd., Geneva

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

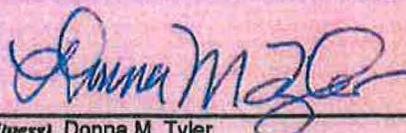
If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, 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. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 11th day of October, 2021.



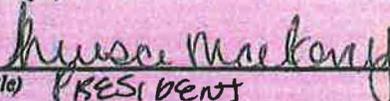
(Witness)



(Witness) Donna M. Tyler

Newcastle Electric, Inc.

(Principal) (Seal)

By: 

(Title) PRESIDENT

West Bend Mutual Insurance Company

(Surety) (Seal)

By: 

(Title) William Reidinger Attorney-in-Fact



SECTION 00310

GENERAL CERTIFICATIONS

The undersigned, as duly-authorized representative of the Contractor, hereby certifies to the City of Geneva, that regarding this project known as **WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2**.

The Following General Certifications are required:

- **Drug Free Workplace Certification**
- **Certification of Compliance with Safety Regulations**
- **Certification of No Tax Delinquency and No Tax Default**
- **Certification of Compliance with Sexual Harassment Policies**
- **Certification of Non-Segregated Facilities**

1. DRUG FREE WORKPLACE CERTIFICATION

The Contractor ensures that they operate a drug free environment and that drugs are not allowed in the workplace or satellite locations as well as City of Geneva project locations in accordance with the Drug Free Workplace Act of January, 1992.

2. CERTIFICATION OF COMPLIANCE WITH SAFETY REGULATIONS

The Contractor is fully aware of and able to comply with all Local, State, and Federal Safety and other Laws, Codes, and Regulations applicable for the construction of the Project.

3. CERTIFICATION OF NO TAX DELIQUENCY AND NO TAX DEFAULT

The Contractor is not currently delinquent in the payment of any tax administered by or owed to the Illinois Department of Revenue, or otherwise in default upon any such tax as defined under 65 ILCS 5/11-42.1-1, or if it is:

- a. It is contesting its liability for the tax or the amount of tax in accordance with procedures established by the appropriate Revenue Act; or
- b. It has entered into an agreement with the Department of Revenue for payment of all taxes due and is currently in compliance with that agreement.

4. CERTIFICATION OF COMPLIANCE WITH SEXUAL HARASSMENT POLICIES

The Contractor has a written sexual harassment policy in place in full compliance with all applicable state and local laws and policies.

5. CERTIFICATION OF NON-SEGREGATED FACILITIES

SECTION 00315

CERTIFICATION OF COMPLIANCE WITH CRIMINAL CODE OF 1961

WHEREAS, a conviction for the offense of bid-rigging or bid rotating bars a person or entity from bidding on public contracts (720 ILCS 5/33D-11), and

WHEREAS, Section 33E-11 of the Criminal Code (720 ILCS 5/33E-11) requires bidders and contractors to certify on a form provided by the unit of local government or school district that they are not barred from public contracting due to bid-rigging or bid rotating convictions.

I, Theresa Maloney, do hereby certify that:
Name

1. I am PRESIDENT of the Newcastle Electric Inc
Position Firm

and have authority to execute this certification on behalf of the firm;

2. This firm is not barred from bidding on or entering into public contracts due to having been convicted of bid-rigging or bid rotating under paragraphs 720 ILCS 5/33E-11 of the Illinois Criminal Code. The undersigned also certifies that no officers or employees of the bidder or contractor have been so convicted and that the bidder or contractor is not the successor company or a new company created by the offices or owners of one so convicted. It is further certified that any such conviction occurring after the date of this certification will be reported to the above named public body, in writing, with seven (7) days of such conviction, if it occurs during any bidding process, contract term or otherwise prior to entering into any contract therewith.

Name of Firm Newcastle Electric Inc

Signature Theresa Maloney

Title President

Date 10-11-2021

SECTION 00330

AFFIDAVIT OF EXPERIENCE

WATER TREATMENT PLANT VFD REPLACEMENT - PHASE 2
CITY OF GENEVA
2021

STATE OF ILLINOIS)
)SS
COUNTY OF COOK)

_____, hereinafter called Principal,
Corporation, Partnership or Individual and which has done work for the following parties of the general
kind and approximate magnitude under this contract:

<u>Name of Owner</u>	<u>Phone #</u>	<u>Job Description</u>	<u>\$ Amount</u>
CITY of Crystal LAKE	815 459-2020	GENERATOR Replacement Lift Station 22	301,680
Village of MT PROSPECT	847 875-0883	MCC Replacement 2020	94,500
CITY of DES Plaines	847 391-6121	Maple St Pumping Station	81,332.04
CITY of ST CHARLES	630 377-4405	GENERATOR Replacement 2020	177,250

and that Newcastle Electric Inc (Name of said Principal, Corporation, Partnership or Individuals)
available for immediate use on the proposed work the following plant and equipment:

CITY OF GENEVA
WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2

AGREEMENT AND BONDS

SECTION 00400

AGREEMENT

**WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2
CITY OF GENEVA
2021**

This Agreement, made this _____ day of November, 2021 by and between the City of Geneva, hereinafter called “Owner”, and Newcastle Electric, Inc., doing business as a Corporation, hereinafter called “Contractor.”

Witnesseth: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The Contractor will commence and complete the construction of the **Water Treatment Plant VFD Replacement – Phase 2.**
2. The Contractor will furnish all of the material, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the Project described herein.
1. The Contractor will commence the work required by the Contract Documents within ten (10) calendar days after the date of the Notice to Proceed. The Contractor will Substantially Complete the Work **60 Days** after the Notice to Proceed and will meet Final Completion **90 Days** after the Notice to Proceed, unless the period for completion is extended otherwise by the Contract Documents.
4. The Contractor agrees to perform all of the Work described in the Contract Documents and comply with the terms therein for the sum of \$28,500.00 as shown in the Bid Form - Section 00300.
5. The term “Contract Documents” means and includes the following:
 - A. Advertisement for Bids
 - B. Instructions for Bidders
 - C. Bid Form
 - D. This Agreement
 - E. Notice of Award
 - F. Notice to Proceed
 - G. Change Order Form
 - H. Performance Bond
 - I. Payment Bond
 - J. Certificates of Insurance
 - K. Certifications (various)
 - L. Specifications prepared or issued by Deuchler Engineering Corp.
 - M. Drawings prepared by Deuchler Engineering Corp.

N. Addenda:

- No. _____, dated _____, 2021

O. Any modification, including Change Orders, duly delivered after execution of Agreement.

- 6. The Owner will pay to the Contractor in the manner and at such times as set forth in the Special Provisions, such amounts as required by the Contract Documents.
- 7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.
- 8. 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 above, plus any extensions thereof allowed in accordance with the Contract Documents. The Contractor also recognizes the difficulties involved in proving the actual loss suffered by the Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Contractor shall pay the cost of engineering time, construction observation time, construction management time and any other costs associated with such delay for each day that expires after the time specified in paragraph 3 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 time specified in paragraph 3 for completion and readiness for final payment, contractor shall pay the cost of engineering time, construction observation time, construction management time and any other costs associated with such delay for each day that expires after the time specified in paragraph 3 for completion and readiness for final payment.

In witness whereof, the parties hereto have executed or caused to be executed by their duly authorized officials this Agreement in **quadruplicate** each of which shall be deemed an original on the date first above written.

Owner:



City of Geneva

By: Stephanie K. Dawkins

Name: Stephanie K. Dawkins

Title: **City Administrator**

Attest:

Name: Jeanne Larnari

Title: Deputy Clerk

Contractor:

Newcastle Electric, Inc.

By: Theresa Maloney

Name: Theresa Maloney

Title: PRESIDENT

(Seal)

Attest:

Name: Theresa Maloney

Title: SECRETARY

SECTION 00410

NOTICE OF AWARD

WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2
CITY OF GENEVA
2021

To:

Date:

The Owner has considered the Bid submitted by you for the above described **WORK** in response to its Advertisement for Bids and Instructions for Bidders.

You are hereby notified that your Bid has been accepted in the amount of \$ 28,500.00.

You are required by the Instructions for Bidders to execute the Agreement and furnish the required Contractor's Performance Bond, Payment Bond, and certificates of insurance within ten (10) calendar days from the date of this Notice of Award to you.

If you fail to execute said Agreement and to furnish said Bonds and certificates of insurance within ten (10) days from the date of this Notice of Award, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Bid as abandoned and as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

City of Geneva

NAME:

Bob Van Dyke

TITLE:

Superintendent of Water & Wastewater

DATE:

11/18/2021

SECTION 00605

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that:

NAME OF CONTRACTOR Newcastle Electric, Inc.

ADDRESS OF CONTRACTOR 1505 Industrial Dr.
Itasca, IL 60143

a Corporation, hereinafter called Principal, and

NAME OF SURETY

WEST BEND MUTUAL INSURANCE COMPANY

ADDRESS OF SURETY

1900 S. 18TH AVE, WEST BEND, WI 53095

hereinafter called Surety, are held and firmly bound unto the **CITY OF GENEVA**, hereinafter called **OWNER**, in the penal sum of \$28,500.00 in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the **OWNER**, dated the 18TH day of November, 2021, a copy of which is hereto attached and made a part hereof for the construction of the **WATER TREATMENT PLANT VFD RELACEMENT - PHASE 2**.

NOW, THEREFORE, if the Principal shall promptly make payment in all persons, firms, **SUBCONTRACTORS**, and corporations furnishing materials for or performing labor in the prosecution of the **WORK** provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such **WORK**, and all insurance premiums on said **WORK**, and for all labor, performed in such **WORK** whether by **SUBCONTRACTOR** or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the **WORK** to be performed thereunder or the **SPECIFICATIONS** accompanying the same shall in any wise affect its obligation on this **BOND**, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the **WORK** or to the **SPECIFICATIONS**.

PROVIDED, FURTHER, that no final settlement between the **OWNER** and the **CONTRACTOR** shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

In witness whereof, this instrument is executed in four (4) counterparts, each of which shall be deemed an original, this the 7th day of December, 2021.

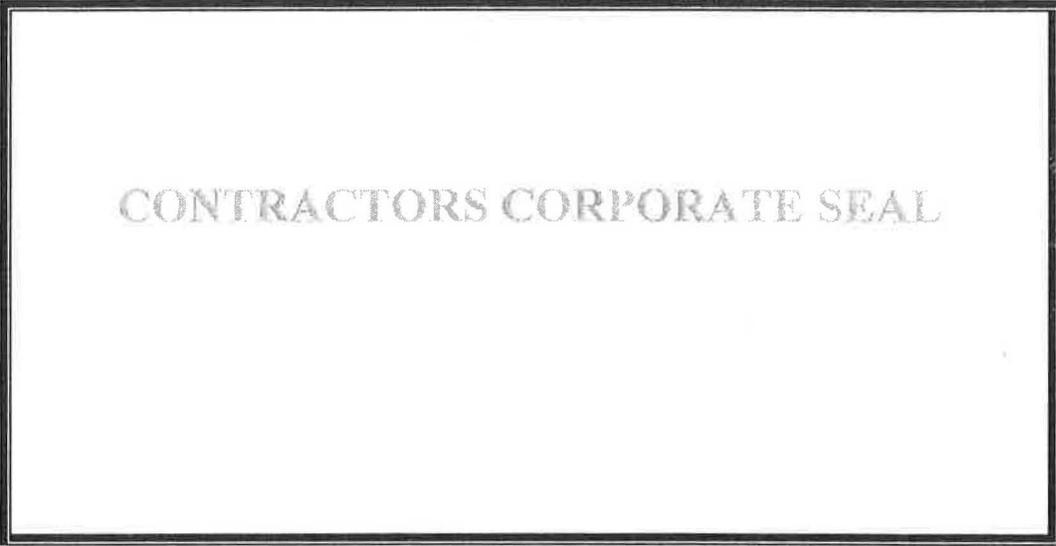
CONTRACTOR

BY: Newcastle Electric, Inc.

NAME: Shesce Maloney, THERESA MALONEY

TITLE: PRESIDENT

ADDRESS: 1505 INDUSTRIAL DRIVE, JASCA, IL 60143



ATTEST

BY: Theresa Maloney
NAME: TERESA MALONEY (PRINCIPAL SECRETARY)
TITLE: SECRETARY, PRESIDENT
ADDRESS: 1505 FN INDUSTRIAL DRIVE, ITASCA IL 60143

WITNESS AS TO PRINCIPAL

BY: Michael Maloney
NAME: Michael Maloney
TITLE: Project Manager
ADDRESS: 1505 INDUSTRIAL DR. ITASCA IL 60143

SURETY

BY:

NAME:

(ATTORNEY IN FACT)

(ATTACH VERIFICATION OF POWER OF ATTORNEY)

ADDRESS: _____



WITNESS AS TO SURETY

BY:

NAME:

ADDRESS: _____

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all Partners should execute BOND.

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.

SECTION 00610
PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that:

NAME OF CONTRACTOR Newcastle Electric, Inc.

ADDRESS OF CONTRACTOR 1505 Industrial Dr.
Itasca, IL 60143

a Corporation, hereinafter called Principal, and

NAME OF SURETY

West Bend Mutual Insurance Company

ADDRESS OF SURETY

1900 South 18th Ave, West Bend, WI 53095

hereinafter called Surety, are held and firmly bound unto the **CITY OF GENEVA** hereinafter called **OWNER**, in the penal sum of \$28,500.00, in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the **OWNER**, dated the 18th day of November, 2021, a copy of which is hereto attached and made a part thereof for the construction of the **WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2**.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the **OWNER**, with or without notice of the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the **OWNER** from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the **OWNER** all outlay and expense which the **OWNER** may incur in making good any default, then his obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the **WORK** to be performed thereunder or the **SPECIFICATIONS** accompanying the same shall in any wise affect its obligation on this **BOND**, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the **WORK** or to the **SPECIFICATIONS**.

PROVIDED, FURTHER, that no final settlement between the **OWNER** and the **CONTRACTOR** shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

CITY OF GENEVA

WATER TREATMENT PLANT VFD REPLACEMENT - PHASE 2

00610-2

PERFORMANCE BOND

IN WITNESS WHEREOF, this instrument is executed in 4 counterparts, each of which shall be deemed an original, this the ____ day of November, 2021.

Any suit under this bond must be instituted before the expiration of the Statute of Limitations applicable to any claim against the contractor named herein.

CONTRACTOR

BY:

Theresa Maloney

Newcastle Electric, Inc.

NAME:

Theresa Maloney

(PRINCIPAL)

TITLE:

PRESIDENT

ADDRESS:

1505 INDUSTRIAL DRIVE, ITASCA, IL 60143

CONTRACTORS CORPORATE SEAL

ATTEST

BY:

Theresa Maloney

NAME:

Theresa Maloney

(PRINCIPAL SECRETARY)

TITLE:

SECRETARY, PRESIDENT

ADDRESS:

1505 INDUSTRIAL DRIVE, ITASCA, IL 60143

WITNESS AS TO PRINCIPAL

BY:

Michael Maloney

NAME:

MICHAEL MALONEY

TITLE:

Project Manager

ADDRESS:

1505 INDUSTRIAL DR, ITASCA IL 60143

SURETY

BY: _____

NAME: _____ (ATTORNEY IN FACT)

(ATTACH VERIFICATION OF POWER OF ATTORNEY)

ADDRESS: _____



WITNESS AS TO SURETY

BY: _____

NAME: _____

ADDRESS: _____

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all Partners should execute BOND.

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.

SECTION 00 72 00

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

STANDARD
GENERAL CONDITIONS
OF THE
CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By



PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by

The Associated General [seal] Contractors of America

Construction Specifications Institute

[seal]

These General Conditions have been prepared for use with the Owner-Contractor Agreements (No. 1910-8-A-1 or 1910-8-A-2) (1996 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC User's Guide (No. 1910-50). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. 1910-17) (1996 Edition).

EJCDC No. 1910-8 (1996 Edition)

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14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and (ii) 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.A 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. *ENGINEER's Consultant*--An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

21. *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.

22. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

23. *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 in connection with the Work.

24. *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.

25. *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.

26. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

27. *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.

28. *Notice of Award*--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.

29. *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.

30. *OWNER*--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.

31. *Partial Utilization*--Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

32. *PCBs*--Polychlorinated biphenyls.

33. *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.

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.

50. *Written Amendment*--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

1.02 *Terminology*

A. *Intent of Certain Terms or Adjectives*

1. Whenever in the Contract Documents the terms "as allowed," "as approved," or terms of like effect or import are used, or 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 action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed 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 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 9.10 or any other provision of the Contract Documents.

B. *Day*

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

C. *Defective*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or 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).

D. *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.

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

Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. Unless otherwise provided in the Contract Documents, at least ten 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.B. CONTRACTOR shall have an additional ten 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 any specified Milestones and 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 Shop Drawing and Sample 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 called for by one is as binding as if called for 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 may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended 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, nor shall any such provision or instruction be effective to assign to OWNER, ENGINEER, or any of ENGINEER's Consultants, agents, or employees 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.

in the Contract Price or Contract Times, or both, as a result of any delay in OWNER's furnishing the Site, 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 of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Contract Documents; and
2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that ENGINEER has used in preparing the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general 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, ENGINEER, or any of ENGINEER's Consultants 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 at or contiguous to the Site 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,

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 of 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:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the ENGINEER in the preparation of the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general 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, ENGINEER or any of ENGINEER's Consultants 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

I. The provisions of paragraphs 4.02, 4.03, and 4.04 are not intended to 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 CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, 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 current 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 must be accompanied by a certified copy of such agent's authority to act.

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 within 20 days thereafter substitute 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 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. OWNER shall deliver to CONTRACTOR, with copies to each additional insured 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.

5.04 *CONTRACTOR's Liability Insurance*

A. CONTRACTOR shall purchase and maintain such liability and other 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: (i) by any person as a result of an offense directly or indirectly related to the employ-

officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, 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, 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 additional insured to whom a certificate of insurance has been issued.

B. OWNER shall purchase and maintain such boiler and machinery 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,

ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with 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 additional insured 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 paragraph 5.06, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. 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, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants

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 2.05.C. 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* 6.01

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, but 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. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

B. At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent thereto who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.

6.02 *Labor; Working Hours*

A. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work 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, and CONTRACTOR will not permit overtime work or the performance of Work on 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 General Requirements, 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.

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 procedure for review by ENGINEER will be as set forth in paragraph 6.05.A.2.d, as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances.

d. CONTRACTOR shall first 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 shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not 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 work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also 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, all of which will be considered by ENGINEER in evaluating the proposed substitute

item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and 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 procedure for review by ENGINEER will be similar to that provided in subparagraph 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 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 either a Change Order for a substitute or 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 time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.

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. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees or agents, and other consultants 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. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

6.09 *Laws and Regulations*

A. CONTRACTOR shall give all notices and 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 primary 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 may 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

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. 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 ENGINEER's Consultant, 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). 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 to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The 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.E.

B. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.

C. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, 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.

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, ENGINEER, and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. 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.

B. 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 acceptance by OWNER or any failure to do so;

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

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

8. any correction of defective Work by OWNER.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other 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:

1. 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; and

2. is caused in whole or in part 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, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.

B. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of

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.

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 Promptly When Due*

A. OWNER shall make payments to CONTRACTOR promptly 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 in respect of 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 in or relating to existing surface or subsurface structures at or contiguous

to the Site that have been utilized by ENGINEER in preparing the Contract Documents.

8.06 *Insurance*

A. OWNER's responsibilities, if any, in 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 in 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. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

9.06 *Rejecting Defective Work*

A. ENGINEER will have authority to disapprove or 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.

9.07 *Shop Drawings, Change Orders and Payments*

A. In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraph 6.17.

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

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

9.08 *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.

9.09 *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. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the

Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.

B. When functioning as interpreter and judge under this paragraph 9.09, 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. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.10 *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

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. Notice of the amount or extent of the Claim, dispute, or other matter 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, dispute, or other matter). 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 Time 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).

B. *ENGINEER's Decision:* ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER's written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:

1. an appeal from ENGINEER's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or

2. if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in

accordance with applicable Laws and Regulations.

C. If ENGINEER does not render a formal decision in writing within the time stated in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; CASH 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 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 include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.

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 at the Site. 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,

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, expressage, and similar petty cash items in connection with the Work.

i. When the Cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the changes in the Work or caused by the event giving rise to the Claim.

j. When all the Work is performed on the basis of cost-plus, 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, 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 and 11.01.B.

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 *Cash 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 as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to

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 paragraph 12.01.C.2.a 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 (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) 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 (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) will be determined in accordance with the provisions of this Article 12.

12.03 *Delays Beyond CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) 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.

12.04 *Delays Within CONTRACTOR's Control*

A. The Contract Times (or Milestones) will not be extended due to 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.

12.05 *Delays Beyond OWNER's and CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and

of ENGINEER, it must, if requested by ENGINEER, be uncovered 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. If it is found that such 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. If, however, such 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 Milestones), 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. 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).

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 Laws or Regulations or 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: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) 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. If CONTRACTOR does not promptly comply with

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 (or Milestones) 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 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 on the Site 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

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 must 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 corrects to OWNER's satisfaction the reasons for such action.

3. If it is subsequently determined 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.

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. Promptly thereafter, 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. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and 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. 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.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the

might in any way be responsible 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. 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 will become due and, when due, 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 and recommendation of ENGINEER, and without

terminating the Agreement, 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 writing which are 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 allowed 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.

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, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or 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. 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. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of paragraphs 9.09 and 10.05, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

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 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 if 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, and 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 Agreement.

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS

WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2
CITY OF GENEVA

These Supplementary Conditions amend or supplement the General Conditions of the Construction Contract (No. 1910-8, 1996 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect. In the event there is any conflict between the Supplementary Conditions and any provision contained in any other portion of the contract, the provisions of the Supplementary Conditions shall prevail.

SC - 1 Definitions

The terms used in these Supplementary Conditions will have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.

SC - 1.01.A.12 Contract Documents

Amend line 3 of paragraph 1.01.A.12 by inserting the words “Advertisement for Bids, Instructions for Bidders,” between the word “the” and “Agreement”.

SC-2.01A

Add the following sentence to the end of the paragraph.

The Contractor shall also submit a schedule of values prior to the Execution of the Agreement. Each line item in the schedule of values must clearly indicate the supplier/subcontractor responsible for that line item.

SC - 2.02A Copies of Documents

Delete paragraph 2.02 of the General Conditions in its entirety and insert the following in its place: “Owner shall furnish to the Contractor up to three (3) copies of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.”

SC - 2.05.B.2

Delete paragraph 2.05.B.2 of the General Conditions in its entirety.

SC -2.05.B.3

Replace Paragraph 2.05.B.3 with:

A complete and detailed schedule of values is to be submitted prior to the Execution of the Agreement.

B. Insurance

During the life of the contract, the **Contractor** shall effect and maintain, with companies satisfactory to the **Owner**, the types of insurance, and in the amounts, described herein.

All insurance shall be from insurance companies duly authorized to do business in the State of Illinois, and shall be issued or countersigned by duly authorized representatives of such insurance companies in the State of Illinois. This insurance shall be provided within ten days of the written Notice of Award of the Contract, and no work shall commence unless the insurance is in effect and has been approved by the **Contractor**. The **Contractor** shall not allow any subcontractor to commence work on his subcontract until all similar insurance required of the subcontractor has been so obtained and approved.

The types of insurance and limits of coverage to be maintained are as follows:

1. Builders Risk Insurance shall not be required for this project.
2. Comprehensive General Liability Insurance covering claims for damages for bodily injury, including accidental death, as well as from claims for property damage which may arise from operations under the Contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them, including coverages for explosion, collapse of other structures and underground utilities. Coverage shall be not less than \$5,000,000.00 for injuries, including wrongful death, to any one person, and subject to the same limit for each person on account of one accident, in a total amount of not less than \$5,000,000.00. Property damage coverage shall be in an amount not less than \$5,000,000.00. The insurance shall contain an endorsement covering the Contract for X, C, and U.

The **Contractor** agrees to name the City of Geneva, Illinois and Deuchler Engineering Corporation as additional insureds within the **Contractor's** comprehensive general liability policy and require this coverage to be subject to the standard conditions and exclusions for the endorsement adding **Engineers** as additional insured to standard comprehensive general liability policies; or the **Contractor** shall have the option to provide an Owner's Protective Liability Policy naming Deuchler Engineering Corporation as an additional insured for the limits shown above. All such coverage shall be primary and non-contributory.

3. The **Contractor** shall require each of his subcontractors to procure and maintain during the life of his subcontract, subcontractor's Comprehensive General Liability Insurance of the type specified in Paragraph B hereof in the amounts equal to that required by the **Contractor**.
4. Workmen's Compensation and Employer's Liability Insurance for all his employees engaged in the work under this Contract, in accordance with the laws of the State of Illinois. The **Contractor** shall require each of his subcontractors to provide Workmen's Compensation (Statutory) and

SC-6.10 Taxes

Sales taxes will not have to be paid on equipment and material purchased for this project.

SC-6.12 Record Documents

Supplement paragraph 6.12 by adding the following:

No progress payments shall be made to Contractor if record documents have not been annotated to show changes made during construction to the ending date of the progress payment period. Contractor shall make record documents available for inspection by the Engineer or Project Representative upon request.

SC-6.13 Safety and Protection

Supplement paragraph 6.13 by adding the following:

Any fines imposed upon the **Owner**, the **Engineer**, or the **Owner's** Agents as a result of the **Contractor's** failure to comply with any safety regulations shall be paid by the **Contractor**.

SC-9.03 Project Representative

Supplement paragraph 9.03 by adding the following:

The duties, responsibilities, and limitations of the Resident Project Representative (RPR) are described as follows:

1. *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 actions. RPR's dealings in matters pertaining to the **Contractor's** work in progress shall in general be with **Engineer** and **Contractor**, keeping **Owner** advised as necessary. RPR's dealings with subcontractors shall 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**.
2. *Schedules:* Review the progress schedule, schedule of Shop Drawings and Sample submittals, and schedule of values prepared by **Contractor** and consult with **Engineer** concerning acceptability.
3. *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.
4. *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.

- c. Observe, record, and report to **Engineer** appropriate details relative to the test procedures and systems 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**.
10. *Records:*
- a. Maintain at the site orderly files for correspondence, reports of job conferences, reproductions of original Contract Documents including all work Change Orders, Field Orders, work Change Directives Addenda, additional Drawings issued subsequent to the execution of the contract, **Engineer's** clarifications and interpretations of the Contract Documents, progress reports, Shop Drawing and Sample submittals received from and delivered to **Contractor**, and other Project related documents.
 - b. Prepare a daily report or keep a diary or log book, recording **Contractor's** hours on the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to **Engineer**.
 - c. Record names, addresses and telephone numbers of all Contractors, subcontractors and major suppliers of materials and equipment.
 - d. Maintain records for use in preparing Project documentation.
 - e. Upon completion of the Work, furnish original set of all RPR Project documentation to **Engineer**.
11. *Reports:*
- a. Furnish to **Engineer** periodic reports as required of progress of the Work and of **Contractor's** compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.
 - b. Draft and recommend to **Engineer** proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from **Contractor**.
 - c. Furnish to **Engineer** and **Owner** copies of all inspection, test, and system startup reports.
 - d. Report immediately to **Engineer** that occurrence of any site accidents, any Hazardous Environmental Conditions, emergencies, or acts of God endangering the work, and property damaged by fire or other causes.
12. *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

- h. Authorize **Owner** to occupy the Project in whole or in part.

SC-14.02.A.2 Applications for Payments

Add the following sentences to Paragraph 14.02.A.2:

The application for payment shall be accompanied by a sworn Contractor's Statement identifying all Subcontractors and Suppliers, the amount of labor and material each has completed, the amount paid, the amount owed and the balance of work remaining. **Owner** reserves the right to directly pay Subcontractors and Suppliers the amount owed for labor and material completed.

Each application for payment must be accompanied by a construction schedule showing all project tasks and durations. If a complete schedule is not submitted with the application for payment, the application for payment will not be processed.

SC-14.02.A.3 Applications for Payments

Delete 14.02.A.3 in its entirety and substitute the following:

The amount of retainage with respect to progress payments will be as stipulated in Specification Section 01 29 76 – Progress Payment Procedures.

SC-16 Dispute Resolution

Delete Article 16 in its entirety.

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 14 00

WORK RESTRICTIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Description of project / site conditions.
 - 2. Description of Required Sequence of construction.
- B. Related Requirements:
 - 1. Section 01 31 13 - Project Coordination.

1.02 PROJECT/SITE CONDITIONS

- A. Environmental Requirements
 - 1. The Contractor shall exercise all the necessary precautions so as not to interfere with the operation of the facility. The Contractor shall obtain approval of the Owner as to his detailed plans and schedules for accomplishing and prosecuting the work prior to starting any operations related to connections to existing facilities. Schedules and plans shall be revised or modified as directed by the Owner. Schedules and plans shall be complete to indicate that the Contractor will be properly mobilized and prepared, in the opinion of the Owner, to carry out any and all operations.
 - 2. All costs, work and requirements including, but not limited to, scheduling, temporary services and construction, coordination and cooperation, rescheduling, maintaining temporary services and construction, field measurements and restoration for accomplishing work to conform to the "Sequence of Construction" and other provisions for connecting to existing facilities shall be included in the lump sum contract price and no separate or additional payment will be made therefore.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

3.01 LIMITATIONS ON SEQUENCE OF CONSTRUCTION

- A. Scheduling of all work shall be organized with the intent of keeping existing facilities in operation and minimizing the impact to the use of existing roadways, utilities, and facilities. Plant processes may not be shutdown.
- B. Only the Owner may operate existing valves, gates, process equipment, etc. Scheduling of work requested of the Owner must take place 48 hours in advance. Without penalty/change order, the Owner at his discretion may choose to deviate from the agreed scheduled shut-down/operation due to over-riding treatment

SECTION 01 26 57
CHANGE ORDER PROCEDURES

PART 1 - GENERAL

1.01 Summary

- A. Section Includes:
 - 1. Procedures for processing Change Orders.
- B. Related Requirements:
 - 1. Section 00400 - Agreement.
 - 2. Section 00530 - Change Order Form.
 - 3. Section 00 72 00 - General Conditions: Governing requirements for changes in the Work, in Contract cost, and Contract time.
 - 4. Section 01 30 00 - Administrative Requirements: Applications for Payment.
 - 5. Section 01 33 00 - Submittal Procedures.
 - 6. Section 01 60 00 - Product Requirements.
 - 7. Section 01 77 00 - Closeout Requirements.

1.02 SUBMITTALS

- A. Submit name of the individual authorized to accept changes, and to be responsible for informing others in Contractor's employ of changes in the Work.
 - 1. As specified in Section 01 30 00 - Administrative Requirements, the use of Google Docs, or similar, will be directed by the Owner. Specifically, all transmittals may be required to be posted into the Google Docs system. The Contractor and all Sub-Contractors will be required to have a Google Docs login (an email address). Access to this system will be coordinated by the Owner.
- B. Change Order Forms: See Section 00530 - Change Order Form.

1.03 PRELIMINARY PROCEDURES

- A. Engineer may submit a Proposal Request which includes: Detailed description of change with supplementary or revised Drawings and Specifications.
 - 1. As specified in Section 01 30 00 - Administrative Requirements, the use of Google Docs, or similar, will be directed by the Owner. Specifically, all RFI's and RFP's may be required to be posted into the Google Docs system. The Contractor and all Sub-Contractors will be required to have a Google Docs login (an email address). Access to this system will be coordinated by the Owner.
- B. Contractor may initiate a change by submittal of a request to Engineer describing the proposed change with a statement of the reason for the change, the effect on Contract Sum and Contract Time with full documentation. Document any

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Unless a specific item is set forth for payment in the Contractor's Bid, all work shall be considered incidental to the lump sum prices as set forth by the Contractor in his bid.

1.02 LEAKAGE TESTS

- A. MEASUREMENT: No separate measurement will be made.
- B. PAYMENT: Separate payment will not be made.

1.03 MANHOLES

- A. MEASUREMENT: No separate measurement will be made.
- B. PAYMENT: Separate payment will not be made.

1.04 CATCH BASINS, INLETS AND VALVE VAULTS

- A. MEASUREMENT: No separate measurement will be made.
- B. PAYMENT: Separate payment will not be made.

1.05 EXCAVATION AND BACKFILL FOR UNDERGROUND CONDUITS

- A. MEASUREMENT: No separate measurement will be made.
- B. PAYMENT: Separate payment will not be made.

1.06 DISINFECTION OF WATER DISTRIBUTION SYSTEM

- A. MEASUREMENT: No separate measurement will be made.
- B. PAYMENT: Separate payment will not be made.

1.07 DEWATERING

- A. MEASUREMENT: No separate measurement will be made.
- B. PAYMENT: Separate payment will not be made.

SECTION 01 29 76

PROGRESS PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Description of progress payment amounts.

1.02 FORMAT and SUBMITTAL REQUIREMENTS

- A. Progress payments shall be submitted in accordance with Article 14 of the General Conditions and paragraphs SC-6.12, SC-14.02.A.2 and SC-14.02.A.3 of the Supplementary Conditions.
- B. The format for the progress payments shall be the same as the Schedule of Values, herein; and provide on AIA forms G702/G703. See sample at end of section.
- C. Each application for payment must be accompanied by a construction schedule showing all project tasks and durations.
 - 1. **If a complete schedule is not submitted with the application for payment, the application for payment will not be processed.**
- D. Submit two copies and all partial waivers/final waivers to the Engineer.
- E. Applications for Payment will be processed by the Engineer as provided in the General Conditions.

1.03 SUBMITTAL SCHEDULE

- A. Submit payment request by the first Monday of each month.

1.04 PROGRESS PAYMENT AMOUNTS

- A. All progress payments will be on the basis of the progress of the Work measured by the Schedule of Values established in Article 2 of the General Conditions and in the case of Unit Price Work based on the number of units completed, or, in the event there is no Schedule of Values, as provided in the General Requirements.
- B. Progress payments shall be made in an amount equal to the percentage indicated below, but in each case, less the aggregate of payment previously made and less such amounts as the Engineer shall determine or Owner may withhold, in accordance with paragraph 14.02B of the General Conditions.
 - 1. The amount of each progress payment shall be limited to:
 - a. One Hundred percent (100%) of the value of the Work completed less the specified retainage (10%).

AIA Document G702™ – 1992

Application and Certificate for Payment

TO OWNER:	PROJECT:	APPLICATION NO:	Distribution to:
		PERIOD TO:	OWNER <input type="checkbox"/>
		CONTRACT FOR:	ARCHITECT <input type="checkbox"/>
FROM CONTRACTOR:	VIA ARCHITECT:	CONTRACT DATE:	CONTRACTOR <input type="checkbox"/>
		PROJECT NOS: / /	FIELD <input type="checkbox"/>
			OTHER <input type="checkbox"/>

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM	\$ _____
2. Net change by Change Orders	\$ _____
3. CONTRACT SUM TO DATE (Line 1 ± 2)	\$ _____
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	\$ _____
5. RETAINAGE:	
a. _____ % of Completed Work (Column D + E on G703)	\$ _____
b. _____ % of Stored Material (Column F on G703)	\$ _____
Total Retainage (Lines 5a + 5b or Total in Column I of G703).....	
6. TOTAL EARNED LESS RETAINAGE	\$ _____ (Line 4 Less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT	\$ _____ (Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE	\$ _____
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	\$ _____

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$ _____	\$ _____
Total approved this Month	\$ _____	\$ _____
TOTALS	\$ _____	\$ _____
NET CHANGES by Change Order	\$ _____	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of: _____

County of: _____

Subscribed and sworn to before
me this _____ day of _____

Notary Public:
My Commission expires: _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the **AMOUNT CERTIFIED**.

AMOUNT CERTIFIED

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The **AMOUNT CERTIFIED** is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract

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SAMPLE FORM

CONTINUATION SHEET

AIA DOCUMENT G703 (Instructions on reverse side)

PAGE OF PAGES

AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing Contractor's signed Certification, is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO.:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO.:

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G TOTAL COMPLETED AND STORED TO DATE (D+E+F)		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE) RATE
			D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		% (G ÷ C)			

SAMPLE FORM



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G703-1992

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SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Title of Work and Type of Contract.
 2. Contractor Use of Premises.
 3. Owner Occupancy.
 4. Applications for Payment.
 5. Coordination.
 6. Field Engineering.
 7. Reference Standards.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work included in this Contract includes:
1. Removal of two existing variable frequency drives (VFDs) and installation of two new VFDs (already purchased and located on site).
 2. New wiring, conduit, and associated civil and electrical work for a complete and operational system.

1.03 CONTRACT METHOD

- A. Construct the work under a lump sum price or unit price per item as shown on the Contractor's Bid Form.

1.04 CONTRACTOR USE OF PREMISES

- A. The site is located at 4000 Keslinger Road, Geneva, IL 60134.
1. Normal working hours are Monday through Friday: 7 a.m. to 4:00 p.m.
 2. Work before and after the specified working hours, and weekends and holidays work may be granted by the Owner if requested in writing at least 48 hours before.
 3. If the Owner grants permission to working beyond normal working hours, the contractor will be working at his own costs and no Holiday or overtime pay will be granted to the contractor.
 4. At the Owner's discretion, if the permission is granted to work beyond the normal working hours, the Owner may request that an Owner's Representative/Engineer be on site for the duration of the work performed. The contractor will therefore be required to absorb the costs for the Owner's Representative/Engineer at a rate of \$110/hour. The costs will accrue and be shown as a credit on the subsequent contractor progress payment application.
 5. **Under no circumstances will underground utility, electric, or excavation work be allowed beyond the specified working hours.**

responsibilities for installing, connecting to, and placing in service, such equipment.

- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Execute cutting and patching to integrate elements of work, uncover ill timed, defective, and non-conforming work, provide openings for penetrations of existing surfaces, and provide samples for testing. Seal penetrations through slabs, walls, and walkways.
- E. The Owner may elect to and require all Contractors and Sub-Contractors to utilize Google Docs, Google Apps, or similar software in addition to standard email, postal mail, and telephone communications.
 - 1. The use of Google Docs, or similar, will be directed by the Owner and may include, but not be limited to; transmittals, memorandums, meeting minutes, Requests For Information (RFI), Requests For Proposals (RFP), punch lists, and shop drawing logs. The Contractor and all Sub-Contractors will be required to have a Google Docs login (an email address). Access to this system will be coordinated by the Owner.
 - 2. Further information, Terms of Conditions, Privacy, Policies, etc. regarding Google Docs can be found at:
<http://www.google.com/google-d-s/terms.html>
 - 3. Each party will be responsible for keeping their own records and archives of documents posted to Google Docs, or similar. All documents will have the ability to be downloaded and printed by each party.
- F. **Electronic submittals will not be accepted for shop drawings submittals. All shop drawings will be submitted per the requirements of Section 01 30 00.**

1.08 CONSTRUCTION LAY-OUT

- A. Provide field engineering services; establish grades, lines and levels, by use of recognized engineering survey practices.
- B. Employ a Land Surveyor registered in the State of Illinois.
- C. Owner will provide bench marks at locations close to the work to establish vertical control for the Contractor. These benchmarks will also have coordinates for use in horizontal control. These benchmarks will be available at the beginning of the project. The Contractor is required to protect and reestablish benchmarks as necessary.
- D. Protect bench marks and other survey reference points.

SECTION 01 31 13
PROJECT COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Coordination of work of contract.
- B. Related Requirements:
 - 1. Section 01 14 00 - Work Restrictions
 - 2. Section 01 30 00 - Administrative Requirements
 - 3. Section 01 73 29 - Cutting and Patching
 - 4. Section 01 31 19 - Project Meetings
 - 5. Section 01 60 00 - Product Requirements: Product options and substitutions.
 - 6. Section 01 77 00 - Execution and Closeout Procedures.

1.02 DESCRIPTION

- A. Coordinate scheduling, submittals and work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.
- B. Coordinate sequence of work to accommodate Owner occupancy as specified in Section 01 30 00 - Administrative Requirements.
 - 1. As specified in Section 01 30 00 - Administrative Requirements, the use of Google Docs, or similar, will be directed by the Owner and may include, but not be limited to; transmittals, memorandums, meeting minutes, Requests For Information (RFI), Requests For Proposals (RFP), punch lists, and shop drawing logs. The Contractor and all Sub-Contractors will be required to have a Google Docs login (an email address). Access to this system will be coordinated by the Owner.

1.03 MEETINGS

- A. In addition to progress meetings specified in Section 01 31 19 - Project Meetings, hold coordination meetings and pre-installation conferences with personnel and subcontractors to assure coordination of work.
- B. The contractor will be responsible for taking minutes of all progress meetings, coordination meetings and pre-installation conferences and of any other meetings necessary to properly coordinate and execute the work.

SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Contractor participation in preconstruction conferences.
 - 2. Contractor administration of progress meetings.
- B. Related Requirements:
 - 1. Section 01 30 00 - Administrative Requirements: Coordination of Work.
 - 2. Section 01 33 00 - Submittal Procedures: Shop drawings, product data, and samples.
 - 3. Section 01 45 00 - Quality Control.
 - 4. Section 01 77 00 - Execution and Closeout Procedures; Project record documents.
 - 5. Individual Specifications Sections; Pre-installation conferences.

1.02 PRECONSTRUCTION CONFERENCES

- A. Engineer will administer preconstruction conference for execution of Owner Contractor Agreement and exchange of preliminary submittals.
- B. Engineer will administer site mobilization conference at Project site for clarification of Contractor responsibilities in use of site and for review of administrative procedures.

1.03 PROGRESS MEETINGS

- A. Schedule and administer weekly Project meetings throughout the progress of the work and pre-installation conferences, when appropriate.
- B. Contractor is to make physical arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within two days to Engineer, participants, and those affected by decisions made at meetings.
 - 1. As specified in Section 01 30 00 - Administrative Requirements, the use of Google Docs, or similar, will be directed by the Owner. Specifically, all meeting minutes may be required to be posted into the Google Docs system. The Contractor and all Sub-Contractors will be required to have a Google Docs login (an email address). Access to this system will be coordinated by the Owner.
- C. Attendance: Job superintendent, major subcontractors and suppliers, Owner, and Engineer as appropriate to agenda topics for each meeting.

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Requirement Included:
 - 1. Procedures
 - 2. Construction Progress Schedules
 - 3. Schedules of Values
 - 4. Shop Drawings
 - 5. Product Data
 - 6. Samples
 - 7. Manufacturer's Instructions
 - 8. Welding Certificates.

- B. Related Requirements:
 - 1. Section 01 30 00 – Administrative Requirements.
 - 2. Section 01 45 00 – Quality Control.
 - 3. Section 01 60 00 – Product Requirements.
 - 4. Section 01 77 00 – Execution and Closeout Procedures.

1.02 PROCEDURES

- A. Deliver a minimum of seven (5) copies of a submittal to the Engineer at 230 S. Woodlawn Avenue, Aurora, IL 60506-5109. One copy to be retained by Resident, one copy to be held for Owner, three copies to be retained by Engineer, and two copies will be returned to the Contractor. Contractor is to submit additional quantities as required.

- B. Submittals to the Engineer shall identify Project, Contractor, subcontractor, major supplier; identify pertinent Drawing sheet and detail number, and Specification Section number, as appropriate. The submittal shall identify deviations from Contract Documents.

- C. The format of the submittal form to be furnished by the Contractor is shown by example at the end of this Section. The Contractor is to pay for printing of form. Submittal Forms shall be 6 sheets of non-carbon paper.

- D. Number submittals consecutively.

- E. As specified in Section 01 30 00 – Administrative Requirements, the use of Google Docs, or similar, will be directed by the Owner. Specifically, all transmittals may be required to be posted into the Google Docs system. The Contractor and all Sub-Contractors will be required to have a Google Docs login (an email address). Access to this system will be coordinated by the Owner.
 - 1. Note that electronic submittals will not be accepted. All shop drawings submitted to the Engineer will be paper copies as outlined herein.

- G. If a drawing or data is stamped “Rejected”, the Contractor shall proceed with new re-submittals.
- H. The Contractor shall revise and resubmit the working drawings as required by the Engineer, until they are stamped “No Exceptions Taken”.
- I. The Contractor shall have no claim for damages or extension of time on account of any delay in the work resulting from the rejection of material or from revision and re-submittal of drawings and other data for review.
- J. The Engineer shall only review a shop drawing a maximum of two times at no cost to the Contractor. The second submittal should be sufficiently complete to be marked “NO EXCEPTIONS TAKEN”. If more than two submittals are required to reach the “NO EXCEPTIONS TAKEN” stage, the cost of review of the submittals will be paid by the Contractor at a rate of \$140.00 per hour.
- K. If a drawing or data is stamped “Information”, the shop drawing was required by the specifications solely for information for the Owner’s file.
- L. If a drawing or data has clearly not been coordinated or reviewed by the General Contractor for completeness, it will be stamped “Requires Review and Approval by Contractor”. The Contractor shall resubmit the documents after properly reviewing them and coordinating with the contract drawings and specifications.

1.06 MANUFACTURER'S INSTRUCTIONS

- A. When required in individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation and start up, adjusting and finishing, in quantities specified.

1.07 SAMPLES

- A. Submit full range of manufacturers' standard colors, textures, and patterns for Owner's selection. Submit samples for selection of finishes within 45 days after date of Contract.
- B. Submit samples to illustrate functional characteristics of the product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.
- C. Include identification on each sample, giving full information.

1.08 WELDING CERTIFICATES

- A. All welders shall have current certificates conforming to requirements of Section IX, Part A of the ASME Boiler and Pressure Code. Welding of specimens to be witnessed by certifying authority. Submit certificates to Engineer prior to proceeding with structural steel or pipe welding.

SECTION 01 42 19

REFERENCE STANDARDS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Applicability of Reference Standards.
 - 2. Provision of Reference Standards at site.
 - 3. Acronyms used in Contract Documents for Reference Standards. Source of Reference Standards.
- B. Related Requirements:
 - 1. Section 00 72 00 - General Conditions: Reference Standards.

1.02 QUALITY ASSURANCE

- A. For products of workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except where more rigid requirements are specified or are required by applicable codes.
- B. The date of the standard is that in effect as of the Bid date, or date of Owner Contractor Agreement when there are no bids, except when a specific date is specified.
- C. When required by individual Specifications section, obtain copy of standard. Maintain copy at job site during submittals, planning, and progress of the specific work, until Substantial Completion.

1.03 SCHEDULE OF REFERENCES

- A. AABC
Associated Air Balance Council
1000 Vermont Avenue, N.W.
Washington, DC 20005
- B. AASHTO
American Association of State Highway and Transportation Officials
444 N. Capitol St., N.W.
Washington, DC 2001
- C. ACI
American Concrete Institute
Box 19150
Reford Station
Detroit, MI 48219
- D. ADC

American Sod Producers Association
Association Building
Ninth and Minnesota
Hastings, NE 68901

- O. ASTM
American Society for Testing and Materials
1916 Race St.
Philadelphia, PA 19103
- P. AWWA
American Water Works Association
6666 West Quincy Avenue
Denver, CO 80235
- Q. AWI
Architectural Woodwork Institute
2310 South Walter Reed Drive
Arlington, VA 22206
- R. AWPA
American Wood Preservers' Association
7735 Old Georgetown Road
Bethesda, MD 20014
- S. CDA
Copper Development Association
57th Floor, Chrysler Building
405 Lexington Avenue
New York, NY 10174
- T. CRSI
Concrete Reinforcing Steel Institute
933 Plum Grove Road
Schaumburg, IL 60195
- U. EJCDC
Engineers' Joint Contract Documents Committee
American Consulting Engineers Council
1050 15th Street, N.W.
Washington, DC 20005
- V. FM
Factory Mutual System
1151 Boston Providence Turnpike
Norwood, MA 02062
- W. FS
Federal Specification
General Services Administration
Specifications and Consumer Information Distribution Section (WFSIS)

CITY OF GENEVA

WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2

01 42 19 - 5

REFERENCE STANDARDS

- HH. NFPA
National Fire Protection Association
Battery March Park
Quincy, MA 02269

- II. NFPA
National Forest Products Association
1619 Massachusetts Avenue, N.W.
Washington, DC 20036

- JJ. PCA
Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077

- KK. PCI
Prestressed Concrete Institute
201 North Wacker Dr.
Chicago, IL 60606

- LL. PS
Product Standard
U.S. Department of Commerce
Washington, DC 20203

- MM. SDI
Steel Door Institute
712 Lakewood Center North
Cleveland, OH 44107

- NN. SJI
Steel Joist Institute
1703 Parham Road
Suite 204
Richmond, VA 23229

- OO. SMACNA
Sheet Metal and Air Conditioning Contractors' National Association
8224 Old Court House Road
Vienna, VA 22180

- PP. SSWSMCI
Standard Specifications For Water and Sewer Main Construction in Illinois

- QQ. SSPC
Steel Structures Painting Council
4400 Fifth Avenue
Pittsburgh, PA 15213

- RR. TAS
Technical Aid Series

SECTION 01 45 00
QUALITY CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Required Testing
 - 2. General Quality Control
 - 3. Workmanship
 - 4. Manufacturers' Instructions
 - 5. Manufacturers' Certificates
 - 6. Manufacturers' Field Services
 - 7. Testing Laboratory Services.

- B. Related Requirements:
 - 1. Section 01 30 00 - Administrative Requirements: Applicability of specified reference standards.
 - 2. Section 01 33 00 - Submittal Procedures.
 - 3. Section 01 42 19 - Reference Standards.
 - 4. Section 01 60 00 - Product Requirements.

1.02 REQUIRED TESTING

- A. Tests required for pavement
 - 1. Proof roll subgrade after vegetation has been cleared and surficial topsoil and other decomposable plant matter has been removed. Proof rolling shall be witness by independent testing laboratory hired by Owner. Proof-roll shall be performed using a loaded dump truck or other approved piece of heavy construction equipment.
 - 2. Nuclear density testing or other type of compaction testing, depending on subgrade material will be performed every lift of fill by independent testing laboratory hired by Owner.
 - 3. Nuclear density testing will be performed on pavement by independent testing laboratory hired by Owner.

1.03 QUALITY CONTROL, GENERAL

- A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.04 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

- B. Perform work by persons qualified to produce workmanship of specified quality.

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Products.
 - 2. Product delivery requirements.
 - 3. Product storage and handling requirements.
 - 4. Product options.
 - 5. Equipment electrical characteristics and components.
 - 6. Substitutions
- B. Related Requirements
 - 1. Section 01 30 00 - Administrative Requirements.
 - 2. Section 01 45 00 - Quality Control.
 - 3. Section 01 77 00 - Closeout Procedures: Operation and Maintenance Data, Warranties and Bonds, Spare Parts.
 - 4. Section 01 79 00 - Demonstration and Training.

1.02 PRODUCTS

- A. Products include material, equipment, and systems.
- B. At minimum, comply with specified requirements and reference standards.
- C. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- D. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- E. Domestic Products: Except where specified otherwise, domestic products are required and interpreted to mean products mined, manufactured, fabricated, or produced in United States or its territories.
- F. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- G. Furnish interchangeable components from same manufacturer for components being replaced.
- H. All materials and equipment furnished for this project shall be new unless otherwise required by the Contract Documents.

- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to procedures identified herein.

1.06 SUBSTITUTIONS

- A. Only within 15 days after date established in Notice to Proceed will Engineer consider requests from Contractor for substitutions. Subsequently, substitutions will be considered only when a product becomes unavailable due to no fault of Contractor.
- B. Time is of the essence of the Contract for this project. The Contractor shall act diligently to obtain the required materials, articles, and pieces of equipment in a timely manner, so that the work of the project will not be delayed. Should the Contractor request permission to furnish a substitute material, article, or piece of equipment, he shall thereby assume full responsibility for any resulting delays, whether approval of the substitution is subsequently granted or denied.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. Request constitutes a representation that Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
 - 2. Will provide the same warranty for substitution as for specified product.
 - 3. Will coordinate installation and make other changes which may be required for Work to be complete in all respects.
 - 4. Waives claims for additional costs which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.
- F. Engineer will determine acceptability of proposed substitution, and will notify Contractor of acceptance or rejection in writing within a reasonable time.
- G. The Engineer may require the Contractor to furnish a special performance guarantee or other surety for the substitute material, article, or piece of equipment, as a condition for approval.
- H. Only one request for substitution will be considered for each product. When substitution is not accepted, provide specified product.
- I. No substitute material, article, or piece of equipment shall be purchased or installed by the Contractor without the Engineer's prior written approval. Should the Contractor furnish or install any substitute material, article, or piece of

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Requirements and limitations for cutting and patching of work.
- B. Related Requirements:
 - 1. Section 01 30 00 - Administrative Requirements.
 - 2. Section 01 60 00 - Product Requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Non shrink, non-metallic, cement based grout.
- B. Primary Products: Those required for original installation.
- C. Submit product data for Engineer's review.

PART 3 - EXECUTION

3.01 GENERAL

- A. Execute cutting, fitting, and patching, to complete work, and to:
 - 1. Fit the several parts together, to integrate with other work.
 - 2. Provide openings in elements of work for penetrations of mechanical work.

3.02 INSPECTION

- A. Inspect existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching.
- B. After uncovering existing work, inspect conditions affecting performance of work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

3.03 PREPARATION

- A. Provide supports to assure structural integrity of surroundings; devices and methods to protect other portions of Project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work.

SECTION 01 75 00
STARTING AND ADJUSTING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Procedures for starting of mechanical and electrical systems
- B. Related Requirements:
 - 1. Section 01 30 00 - Administrative Requirements.
 - 2. Section 01 45 00 - Quality Control.
 - 3. Section 01 60 00 - Product Requirements.
 - 4. Individual Sections - Specific requirements for startup.

1.02 QUALITY CONTROL

- A. When manufacturer's field services are specified in individual sections, require manufacturer to provide authorized representative to be present at site (under provisions of Section 01 45 00 – Quality Control) to inspect, check, and approve equipment installation prior to start up; to supervise placing equipment in operation; and to provide a written report that equipment has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting lines or anchor bolts, and has been satisfactorily operated under full load conditions.

1.03 SUBMITTALS

- A. Submit preliminary schedule listing times and dates for startup of each item of equipment in sequence (2 weeks) prior to proposed dates.
- B. Submit manufacturer's representative reports within one week after start up, listing satisfactory start up dates.

1.04 PROJECT CONDITIONS

- A. Interdependent systems have been checked and are operational.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that Project conditions comply with requirements.
- B. Verify that status of Work meets requirements for starting of equipment and systems.

SECTION 01 77 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Field engineering.
 - 2. Closeout procedures.
 - 3. Starting of systems.
 - 4. Demonstration and instructions.
 - 5. Testing, adjusting, and balancing.
 - 6. Project record documents.
 - 7. Operation and maintenance data.
 - 8. Manual for materials and finishes.
 - 9. Manual for equipment and systems.
 - 10. Spare parts and maintenance products.
 - 11. Product warranties and product bonds.
 - 12. Examination.
 - 13. Preparation.
 - 14. Execution.
 - 15. Cutting and patching.
 - 16. Protecting installed construction.
 - 17. Final cleaning.

1.02 FIELD ENGINEERING

- A. Employ land surveyor registered in State of Illinois and acceptable to Engineer.
- B. Owner will locate and Contractor shall protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.
- C. Control datum for survey is established by Owner-provided survey as indicated on Drawings.
- D. Prior to beginning Work, verify and establish floor elevations of existing facilities to ensure that new Work will meet existing elevations in smooth and level alignment except where specifically detailed or indicated otherwise.
- E. Verify setbacks and easements; confirm Drawing dimensions and elevations.
- F. Provide field engineering services. Establish elevations, lines, and levels using recognized engineering survey practices.
- G. Submit copy of Site drawing signed by land surveyor certifying elevations and locations of the Work are in conformance with Contract Documents.

- a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).
 2. Within seven days after receipt of request for Substantial Completion, Engineer and Owner will make inspection to determine whether Work or designated portion is substantially complete.
 3. Should Engineer determine that Work is not substantially complete:
 - a. Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Engineer.
 - c. Engineer and Owner will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.
 4. When Engineer finds that Work is substantially complete, Engineer will:
 - a. Prepare Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.
 5. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
 - b. Complete Work listed for completion or correction within time period stipulated.
 6. Owner will occupy portions of building as specified in Section 01 30 00 – Administrative Requirements.
- C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
1. When Contractor considers Work to be complete, submit written certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.
 2. Submittals: Submit following:
 - a. Final punch list indicating all items have been completed or corrected.
 - b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 - e. Contractor's affidavit of payment of debts and claims on AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
 - f. Contractor affidavit of release of liens on AIA G706A - Contractor's Affidavit of Release of Liens.

- B. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- C. Demonstrate Project equipment. Instruct in classroom environment located at existing administration building and instructed by manufacturer's representative who is knowledgeable about the Project.
- D. Video Recordings: The Owner may elect, at their expense, Provide high-quality color video recordings of demonstration and instructional sessions. Engage commercial videographer to record sessions. Include classroom instructions, demonstrations, board diagrams, and other visual aids. Include menu navigation.
- E. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- F. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- G. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment or designated location.
- H. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- I. Required instruction time for each item of equipment and system is specified in individual Specification Sections.

1.06 PROJECT RECORD DOCUMENTS

- A. Maintain on Site two sets of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, product data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates used.
 - 3. Changes made by Addenda and modifications.

addresses, and telephone numbers of Subcontractors and suppliers. Include the following:

- a. Significant design criteria.
- b. List of equipment.
- c. Parts list for each component.
- d. Operating instructions.
- e. Maintenance instructions for equipment and systems.
- f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
- g. Safety precautions to be taken when operating and maintaining or working near equipment.

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

- a. Shop Drawings and product data.
- b. Air and water balance reports.
- c. Certificates.
- d. Originals of warranties and bonds, notarized.

G. All contents shall be punched for binding in a manner that does not obliterate any data, or enclosed in suitable clear vinyl sheet protectors.

1.08 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.
- B. Deliver to Project Site and place in location as directed by Owner; obtain receipt prior to final payment.

1.09 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include table of contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit five copies prior to final Application for Payment.
- G. Time of Submittals:
 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.

2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Engineer for final decision.
- E. Allow for expansion of materials and building movement.
- F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
- G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
1. Refer questionable mounting heights choices to Engineer for final decision.
 2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- H. Adjust operating products and equipment to ensure smooth and unhindered operation.
- I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.04 CUTTING AND PATCHING

- A. Employ original installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
1. Structural integrity of element.
 2. Integrity of weather-exposed or moisture-resistant elements.
 3. Efficiency, maintenance, or safety of element.
 4. Visual qualities of sight-exposed elements.
 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching to complete Work and to:
1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed Work.
 3. Remove and replace defective and nonconforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

- C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean Site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION

SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Procedures for demonstration of equipment operation and instruction of Owner's personnel.

- B. Related Requirements:
 - 1. Section 01 30 00 - Administrative Requirements.
 - 2. Section 01 60 00 - Product Requirements: Systems Demonstration
 - 3. Section 01 75 00 - Starting and Adjusting.
 - 4. Section 01 77 00 - Contract Procedures: Operation and Maintenance Data.
 - 5. Individual Sections - Specific requirements for demonstrating systems and equipment.

1.02 QUALITY ASSURANCE

- A. For all items specified in Divisions 26 and 40, provide authorized manufacturer's representative to demonstrate operation of equipment systems, instruct Owner's personnel, and provide written report that demonstrations and instructions have been completed.

- B. Owner will provide list of personnel to receive instructions, and will coordinate their attendance at agreed upon times.

1.03 SUBMITTALS

- A. Submit preliminary schedule for Owner's approval, listing times and dates for demonstration of each item of equipment and each system, two weeks prior to proposed dates.

- B. Submit records within two weeks after completion of demonstrations, that demonstrations and instructions have been satisfactorily completed. Give time and date of each demonstration, and hours devoted to demonstration, with a list of persons present.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify equipment has been inspected and put into operation in accordance with Section 01 75 00 – Starting and Adjusting; testing, adjusting, and balancing has been performed and startup reports submitted in accordance with Section

DIVISION 03

CONCRETE

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

- A. This Section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for footings, walls, slabs-on-ground, equipment pads, and sidewalks.
- B. Work on this project shall conform to all requirements of ACI 301-10 ‘Specifications for Structural Concrete’ published by the American Concrete Institute, Farmington Hills, Michigan, except as modified by these Contract Documents.
- C. Contractor shall keep in his field office for reference a copy of ACI SP-15(10) ‘Field Reference Manual’.

1.02 SUBMITTALS

- A. Qualification Data: For installer and manufacturer.
- B. Material Certificates/Test Reports: For each of the following:
 - 1. Cementitious materials.
 - 2. Aggregates.
 - 3. Admixtures.
 - 4. Form materials and form-release agents.
 - 5. Steel reinforcement and accessories.
 - 6. Waterstops.
 - 7. Curing compounds.
 - 8. Bonding agents.
 - 9. Joint-filler strips.
 - 10. Repair materials.
- C. Design Mixtures: For each concrete mixture.
- D. Shop Drawings: Detailing and Placement drawings for steel reinforcement.
- E. Field quality-control reports.
- F. Minutes of preinstallation conference.
- G. Propose construction layout, location of construction joints subject to Engineer’s approval.
- H. Samples: For waterstops, vapor retarder.

2.03 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I/Type II, supplemented by:
 - a. Fly Ash: ASTM C618, Class C or F.
 - b. Slag Cement: ASTM C989, Grade 100 or 120.
 - c. Silica Fume: ASTM C1240.
- B. Normal-Weight Aggregates: ASTM C33.
 - 1. Coarse Aggregate: 1-1/2-inch or 3/4-inch nominal maximum size.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
 - 3. Chert content in aggregate: For walls 3%, for flat work less than 3%.
- C. Water: Potable.
- D. Air-Entraining Admixture: ASTM C260.
- E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C494, Type A.
 - 2. Retarding Admixture: ASTM C494, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C494, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
 - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C1017, Type II.

2.04 VAPOR RETARDERS

- A. Plastic Vapor Retarder: ASTM E1745, or polyethylene sheet, ASTM D4397, not less than 10 mils thick. Include manufacturer's recommended adhesive or pressure-sensitive joint tape.

2.05 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.

4	Misc. Interior Concrete	C0, F0, S1, P0	4500 psi	3/4"	Note 1	0.5	Notes 2 & 3	1.0
5	Misc. Exterior Concrete	C1, F2, S1, P0	4500 psi	3/4"	6.0	0.45	Notes 2 & 3	0.30

1. Concrete to receive a hard trowel finish shall not contain an air entraining admixture and shall not have a total air content greater than 3 percent. For concrete not receiving a hard trowel finish, the total air content shall be 5% (commensurate with a Class F1 exposure Category) in order to improve durability and workability.
2. The Tricalcium Aluminate (C₃A) content in cement shall be limited to a maximum of 8.0 percent corresponding to a Class S1 moderate sulfate (SO₄) exposure.
3. Admixtures containing calcium chloride shall not be permitted.
4. 7-day compressive strength shall be 3800 PSI.
5. Minimum cementitious materials content for slabs-on-ground shall be 540 lb/cubic yard for ¾" nominal size aggregate mix.
6. Water to Cementitious materials ratio by weight.
7. Maximum water-soluble chloride ion (Cl⁻) content in concrete, percent by weight of cement.

2.08 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.09 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 90 to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.01 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork according to ACI 301 to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Chamfer exterior corners and edges of permanently exposed concrete.

- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C. Cold-Weather Placement: Request acceptance of proposed cold-weather placement, temperature measuring methods, and protection activities.
- D. Hot-Weather Placement: Request acceptance of proposed hot-weather placement, temperature measuring methods, and protection activities.

3.07 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.08 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 301 recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to all surfaces to receive trowel finish.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces exposed to view.

DIVISION 26

ELECTRICAL

SECTION 26 05 19**LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES****PART 1 GENERAL****1.01 SUMMARY**

- A. Work Included:
 - 1. Section includes building wire and cable; nonmetallic-sheathed cable; service entrance cable; and wiring connectors and connections.
- B. Related Sections:
 - 1. Section 26 05 29 – Hangers and Supports for Electrical Systems – Supporting Devices
 - 2. Section 26 05 33 – Raceway and Boxes for Electrical Systems
 - 3. Section 26 05 53 - Identification for Electrical Systems: Product requirements for wire identification.

1.02 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. American Society for Testing and Materials, (ASTM):
 - 1. ASTM B 8 – Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard or Soft.
 - 2. ASTM D1248 – Standard Specification for Polyethylene Plastic Molding and Extrusion Material.
 - 3. ASTM D3485 – Specification for Smooth-Wall Coilable Polyethylene (PE) Conduit (Duct) for Preassembled Wire and Cable.
- C. Federal Specifications, (FS):
 - 1. FS HH-I-595 – Insulation Tape, Electrical, Pressure Sensitive Adhesive, Plastic.
- D. Insulated Cable Engineers Association (ICEA, formally IPCEA):
 - 1. ICEA S-66-524 – Cross-Linked-Thermosetting-Polyethylene-Insulated.
 - 2. ICE S-73-532 – Standard for Control, Thermocouple Extension, and Instrumentation Cables.
 - 3. ICEA S95-685 – Power Cables Rated 2000Volts or Less for the Distribution of Electrical Energy.
 - 4. ICEA T-29-520 – Flame Test.
- E. International Electrical Testing Association (NETA):
 - 1. NETA ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- F. National Fire Protection Association:

E. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

F. Test Reports: Indicate procedures and values obtained.

1.06 CLOSEOUT SUBMITTALS

A. Section 01 77 00 – Closeout Procedures: Requirements for submittals.

B. Project Record Documents: Record actual locations of components and circuits.

1.07 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.08 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle Products to site under provisions of Section 01 60 00.

B. Deliver wire and cables in full reels protected against injury. Deliver reels with factory attached UL approved tags showing the manufacturer's name and the type of insulation, size, and length or wire in each coil or reel.

C. Accept wire and cable on site in manufacturer's packaging. Inspect for damage.

D. Store and protect in accordance with manufacturer's instructions.

E. Protect from weather. Provide adequate ventilation to prevent condensation.

1.10 FIELD MEASUREMENTS

A. Verify field measurements are as indicated on Drawings.

1.11 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Determine required separation and cable routing to avoid interference with other work.

C. Determine cable routing to avoid interference with other work.

2.03 SIGNAL CABLE

- A. **Manufacturers:**
 - 1. Belden Inc.
 - 2. General Cable; General Cable Corporation.
 - 3. Substitutions: per Section 01 60 00 – Product Requirements.
- B. **Product Description:** 2 and 3 conductor insulated wire, multi-conductor, shielded cable, or multi-pair signal cable with individual pair shielding and overall shield.
- C. **Conductor:** Tinned copper with 7-strand concentric Class B stranding, not smaller than #16 AWG.
- D. **Insulation:** 15 mil PVC or polyethylene insulation with an overall sunlight-resistant PVC jacket, rated for 600 volts.
- E. **Number of conductors or conductor pairs:** as shown on plans drawings. Each conductor or conductor pair shall be color coded.
- F. **Shield:** Paired conductors are to have an aluminum-polyester foil shield with a tinned copper drain wire and an overall cable shield of aluminum-polyester foil. 2 and 3 conductor cables to have an overall shield of aluminum-polyester.

2.04 TERMINATIONS

- A. **Install terminal lugs on ends of 600-volt wires unless lugs are provided on connected device, such as circuit breakers.**
- B. **Terminal Lugs for Wires 6 AWG and Smaller:** Solderless, compression type copper.
- C. **Lugs for Wires 4 AWG and Larger:** Color keyed, compression type copper, with insulating sealing collars.
- D. **Size lugs per manufacturer recommendation for wire sizes terminated. Install 2-hole type lugs to connect wires No. 4 and large to copper bus bar.**
- E. **Terminal lugs which are fastened together, as on motors, transformers, and other apparatus, or when the space between studs is so small that lugs can turn and touch each other, to be insulated for a dielectric strength of 2-1/2 times the normal potential of the circuit.**

PART 3 EXECUTION**3.01 EXAMINATION**

- A. **Section 01 30 00 – Administrative Requirements: Coordination and project conditions.**
- B. **Verify interior of building has been protected from weather.**

- Q. Provide slack in each run for contraction and expansion of wires.
- R. Identify and color code wire and cable under provisions of Section 26 05 53. Identify each conductor with its circuit number or other designation indicated.
- S. Special Techniques--Building Wire in Raceway:
1. Protect exposed wire and cable from damage.
 2. Pull conductors into raceway at same time.
 3. Use cable grips or other devices to distribute the strain to the conductor, insulation, and jacket.
 4. Use fish tapes, cable grips, and other devices used to pull wires having no sharp projections that will scratch or otherwise injure raceway interior.
 5. Install building wire 4 AWG and larger with pulling equipment.
- T. Special Techniques - Cable:
1. Protect exposed cable from damage.
 2. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels.
 3. Use suitable cable fittings and connectors.
- U. Special Techniques – Wiring Connections:
1. Clean conductor surfaces before installing lugs and connectors.
 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
 4. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
 5. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
 6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
 7. Materials used for splices shall be compatible with the conductors, insulators and protective jackets. Splices shall insulate and protect the conductors as much as the insulation and protective jackets of the individual wires and cables.
 8. Splices in signal cables shall be nylon, self-insulated, crimp type for individual conductors, with an overall covering of plastic tape, heat shrinkable plastic sleeve, or powered epoxy, installed in accordance with manufacturer's recommendations.
- V. Install stranded conductors for feeders and branch circuits 8 AWG and larger.
- W. Install solid conductors for branch circuits 10 AWG and smaller. If stranded conductors are used, install crimp-on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.

3.06 FIELD QUALITY CONTROL

- A. Section 01 45 00 – Quality Control; Section 01 70 00 - Closeout Procedures:
Field inspecting, testing, adjusting, and balancing.
- B. Perform field inspection and testing.
- C. Inspect and test in accordance with NETA ATS, except Section 4.
- D. Perform inspections and tests listed in NETA ATS, Section 7.3.1.
- E. Inspect wire and cable for physical damage and proper connection.
- F. Measure tightness of bolted connections and compare torque measurements with
manufacturer's recommended values.
- G. Verify continuity of each branch circuit conductor.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Rod electrodes.
 - 2. Grounding conductors.
 - 3. Mechanical connectors.
 - 4. Exothermic connections.
 - 5. Equipment grounding conductors.
 - 6. Bonding methods and materials.
- B. Related Sections:
 - 1. Section 26 05 53 – Identification for Electrical Systems.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E814 – Test Method for Fire Test of Through-Penetration Fire Stop
- B. Institute of Electrical and Electronics Engineers (IEEE):
 - 1. IEEE C2 – National Electrical Safety Code
 - 2. IEEE 80 – Guide for Safety in AC Substation Grounding
 - 3. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - 4. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. National Electrical Contractors Association (NECA):
 - 1. NECA Standard of Installation
- E. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA 250 – Enclosures for Electrical Equipment (1,000 Volts Maximum)
- F. National Fire Protection Association (NFPA):
 - 1. NFPA 70 - National Electrical Code.
 - 2. NFPA 70E – National Electrical Safety Code.
- G. Underwriters Laboratories (UL):

1.07 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 – Executive and Closeout Requirements: Requirements for submittals.
- B. Manufacturer’s field reports.
- C. Project Record Documents: Record actual locations of components and grounding electrodes.
- D. Certificate of Compliance: Indicate approval of installation by authority having jurisdiction.

1.08 QUALITY ASSURANCE

- A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL label.
- B. Maintain one copy of each document on site.

1.09 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing work of this section with minimum five years documented experience approved by manufacturer.

1.10 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.11 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 – Administrative Requirements: Pre-installation meeting
- B. Convene minimum one week prior to commencing work of this section.

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 – Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

2.04 EXOTHERMIC CONNECTIONS

- A. Manufacturers:
 - 1. ERICO International Corporation
 - 2. Burndy; part of Hubbell Electrical Systems.
 - 3. Substitutions: Per Section 01 60 00 – Product Requirements.
- B. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify final backfill and compaction has been completed before driving rod electrodes.
- C. Verify routing and termination locations of cable prior to rough-in.
- D. Electrode locations and cable routing are shown on drawings in approximate locations unless dimensioned.

3.02 PREPARATION

- A. Remove paint, rust, mill oils, and other surface contaminants at connection points.

3.03 EXISTING WORK

- A. Modify existing grounding system to maintain continuity to accommodate renovations.
- B. Extend existing grounding system using materials and methods compatible with existing electrical installations, or as specified.

3.04 INSTALLATION

- A. Section 01 45 00 – Quality Control: Manufacturer’s instructions.
- B. Install grounding and bonding to meet Regulatory Requirements.
- C. Install in accordance with IEEE 142 and IEEE 1100.
- D. Install rod electrodes at locations as indicated on Drawings. Install additional rod electrodes where required to achieve specified resistance to ground.
- E. Install grounding and bonding conductors concealed from view.

- S. Permanently attach equipment and grounding conductors prior to energizing equipment.
- T. Install rod electrodes in vertical position with bottom at least 5 feet (1600 mm) below frost line.
- U. Install grounding conductors outside of structures 2 feet (600 mm) below frost line.
- V. Install multiple electrodes forming a grounding field a minimum of 10 feet (3 m) apart.
- W. Make grounding connections to driven ground rods.
- X. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- Y. Equipment Grounding Conductor: In all non-metallic conduits, provide a separate, insulated grounding conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- Z. Connect to site grounding system.

3.05 FIELD QUALITY CONTROL

- A. Sections 01 45 00 - Quality Control and 01 77 00 - Closeout Procedures: Field inspecting, testing, adjusting, and balancing.
- B. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- C. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method.
- D. Inspect and test in accordance with NETA ATS, except Section 4.
- E. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.
- F. Perform ground resistance testing in accordance with IEEE 142.
- G. Perform leakage current tests in accordance with NFPA 99.
- H. Perform continuity testing in accordance with IEEE 142.
- I. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION

SECTION 26 05 29**HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS****PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes:
1. Conduit supports.
 2. Anchors and fasteners
 3. Formed steel channel.
 4. Concrete Inserts
 5. Sleeves.
 6. Mechanical sleeve seals.
 7. Firestopping relating to electrical work
 8. Firestopping accessories
- B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section

1.02 REFERENCES

- A. ASTM International:
1. ASTM A123/A123M – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 2. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 3. ASTM A924/A924M – Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
 4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 5. ASTM E119 – Standard Method for Fire Tests of Building Construction and Materials
 6. ASTM E814 – Standard Test Method of Fire Tests of Through Penetration Firestops
 7. ASTM E1966 – Standard Test Method for Fire-Resistive Joint Systems
- B. Factory Mutual Engineering Corporation (FM):
1. FM – Approval Guide, A Guide to Equipment, Materials & Services Approved by Factory Mutual Research For Property Conservation.
- C. Institute of Electrical and Electronic Engineers (IEEE):
1. ANSI/IEEE C2 – National Electrical Safety Code
 2. IEEE 80 – Guide for Safety in AC Substation Grounding
 3. IEEE 142 – Grounding of Industrial and Commercial Power Systems
- D. National Contractors Association (NECA):

1. Hangers and Supports: Submit special procedures and assembly of components.
 2. Firstopping: Submit preparation and installation instructions.
- G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- 1.05 QUALITY ASSURANCE
- A. Maintain one copy of each document on site.
- 1.06 QUALIFICATIONS
- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.
 - B. Installer: Company specializing in performing work of this section with minimum five years documented experience approved by manufacturer.
- 1.07 PRE-INSTALLATION MEETINGS
- A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.
 - B. Convene minimum one week prior to commencing work of this section.
- 1.08 CLOSEOUT SUBMITTALS
- A. Section 01 77 00 – Closeout Procedures: Requirements for contract closeout
 - B. Certificate of Compliance: Indicate approval of installation by authority having jurisdiction.
 - C. Maintenance Data: Identify local spare part sources.
- 1.09 REGULATORY REQUIREMENTS
- A. Conform to requirements of NFPA 70
 - B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.
- 1.10 DELIVERY, STORAGE, AND HANDLING
- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
 - B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
 - C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1. Cooper B-Line, Inc.
2. Unistrut; Atkore International.
3. Substitutions: Section 01 60 00 - Product Requirements.

- B. Product Description: Heavy duty continuous slotted channel concrete inserts. Galvanized steel 12 gage (2.8 mm) thick, with integral anchors at 6 inch (150 mm) centers.
- C. Inserts for individual hangers: Galvanized malleable iron.
- D. Nuts: Removable type held in place by V-type teeth.
- E. Cover Plates: Snap on type, factory finished steel. Provide on channel inserts between support attachments.

2.05 SLEEVES

- A. Sleeves for Conduit Through Non-Fire Rated Floors: 18 gage (1.2 mm) thick galvanized steel.
- B. Sleeves for Conduit Through Non-Fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage (1.2 mm) thick galvanized steel.
- C. Sleeves for Conduit Through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.
- D. Fire-stopping Insulation: Glass fiber type, non-combustible.

2.06 MECHANICAL SLEEVE SEALS

- A. Manufacturers:
1. ThunderLine, Link-Seal, Inc..
 2. Substitutions: Section 01 60 00 - Product Requirements.
- B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.
- C. Seal Element: EPDM
- D. Pressure Plates: Composite
- E. Nuts and Bolts: 316 Stainless Steel
- F. Temperature Range: Minus 40 to 250 degrees F (minus 40 to 121 degrees C)

1. Install inserts for placement in concrete forms.
 2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
 3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches (100 mm).
 4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
 5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.
- C. Install surface mounted cabinets and panelboards with minimum of four anchors.
- D. In wet and damp locations, install steel channel supports to stand cabinets and panelboards 1 inch (25 mm) off wall.
- E. Install sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- F. Support frames and anchors for mounting equipment to be furnished by the Contractor and approved by the Engineer.
- G. Raceway Surface Mounted:
1. Support by one-hole, malleable iron clamps with clamp backs which provide clearance between the raceway and the mounting surface.
 2. Support by trapeze, ring, or clevis hangers. Supports for raceway 2 in (50 mm) and smaller shall be zinc plated adjustable swivel ring hangers, and for larger raceways supports shall be galvanized adjustable clevis type hangers.
- H. Trapeze Hangers:
1. Structural channels, angle irons, or formed steel channel shapes with raceways held in place by U-bolts, clips, or clamps.
 2. Members hot dipped galvanized after fabrication.
 3. Grind and dressed hanger edges.
 4. Install end caps on field cut edges.
- I. Install conduit and raceway support and spacing in accordance with NEC.
- J. Support coated conduit with PVC coated fasteners and supports.
- K. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- L. Install multiple conduit runs on common hangers.
- M. Supports:
1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
 2. Install surface mounted cabinets and panelboards with minimum of four anchors.

3.07 FIELD QUALITY CONTROL

- A. Inspect installed firestopping for compliance.

3.08 CLEANING

- A. Section 01 77 00 - Closeout Procedures: Requirements for cleaning.
- B. Clean adjacent surfaces of firestopping materials.

3.09 PROTECTION OF FINISHED WORK

- A. Section 01 77 00 - Closeout Procedures: Requirements for protecting finished Work.
- B. Protect adjacent surfaces from damage by material installation.

3.10 SCHEDULES

- A. Hanger rods shall be of adequate size, not less than 3/8 in (10 mm), galvanized, and furnished in the quantity shown in the following tabulation:

<u>Length of Hanger, In (mm)</u>	<u>Number of Bolts or Rods</u>
36 (900) and Less	3
Greater than 36 (900) and Less than 48 (1200)	3
Greater than 48 (1200)	4

- B. Space supports for exposed rigid conduit as follows:

<u>Conduit Size Inches (mm)</u>	<u>Number Of Conduits</u>	<u>Maximum Spacing of Supports, Ft (mm)</u>	
		<u>Horizontal</u>	<u>Vertical</u>
1/2 (13 mm) & 3/4 (19 mm)	1 or 2	7 (2100)	7 (2100)
	3 or More	5 (1500)	7 (2100)
1 (25 mm) & 1-1/4 (32 mm)	1 or 2	10 (3000)	8 (2400)
	3 or More	6 (1800)	8 (2400)
1-1/2 (38 mm) and Larger	1 or 2	10 (3000)	10 (3000)
	3 or More	6 (1800)	10 (3000)

SECTION 26 05 33**RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS****PART 1 GENERAL**

1.01 SUMMARY

- A. Section includes:
 - 1. Raceway:
 - A. Metal conduit.
 - B. Liquid tight flexible metal conduit.
 - C. Rigid non-metallic conduit.
 - D. Wireways.
 - E. Conduit fittings.
 - F. Expansion fittings.
 - G. Wall seals.
 - H. Conduit hubs.
 - 2. Boxes:
 - A. Outlet boxes.
 - B. Pull and junction boxes.
- B. Related Sections:
 - 1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
 - 2. Section 26 05 29 - Hangers and Supports for Electrical Systems.
 - 3. Section 26 05 53 - Identification for Electrical Systems.

1.02 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
 - 2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM A123/A123M – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - 2. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 3. ASTM A924/A924M – Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
 - 4. ASTM D870 – Practice for Testing Water Resistance of Coatings Using Water Immersion
 - 5. ASTM D1151 – Standard Practice for Effect of Moisture and Temperature on Adhesive Bonds
 - 6. ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test
- C. Federal Specifications (FS):

- B. Underground More than 5 feet (1500 mm) outside Foundation Wall: Provide rigid steel conduit. Provide cast metal boxes or nonmetallic handholes. Thickwall non-metallic conduit encased in concrete may be used in place of rigid steel conduit sizes 2 inch (50 mm) or larger.
- C. Underground Within 5 feet (1500 mm) from Foundation Wall: Provide rigid steel conduit. Provide cast metal or nonmetallic boxes.
- D. In or Under Slab on Grade: Provide PVC conduit. Provide cast or nonmetallic boxes.
- E. Outdoor Locations, Above Grade: Provide rigid steel conduit. Provide cast metal or nonmetallic outlet, pull, and junction boxes.
- F. In Slab Above Grade: Provide PVC conduit. Provide cast or nonmetallic boxes.
- G. Wet and Damp Locations: Provide rigid steel conduit. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet boxes in finished areas.
- H. Concealed Dry Locations: Provide rigid steel conduit. Provide sheet-metal boxes. Provide flush mounting outlet boxes in finished areas. Provide hinged enclosure for large pull boxes.
- I. Exposed Dry Locations: Provide rigid steel conduit. Provide sheet-metal boxes. Provide flush mounting outlet boxes in finished areas. Provide hinged enclosure for large pull boxes.
- J. Corrosive Environments, such as digester gas handling, chlorine feeder and chlorine storage rooms: Provide PVC-coated rigid steel conduit. Provide stainless steel sheet metal boxes. Provide stainless steel supports and fasteners in accordance with Section 26 05 29.

1.04 DESIGN REQUIREMENTS

- A. Raceway Size: ANSI/NFPA 70 as a minimum, larger where indicated.
- B. Minimum Raceway Size: 3/4 inch (19 mm) unless otherwise specified.
- C. Maximum Raceway Size in Slab Above Grade: 1-1/4 inch (30 mm); 1 inch (25 mm) for conduits crossing each other.
- D. Minimum Raceway Size for Underground Installation: 2 inch (50 mm).
- E. Box Size:
 - 1. ANSI/NFPA 70 as a minimum, larger where indicated.
 - 2. Larger sizes or additional boxes may be installed to utilize standard sizes or to facilitate the installation.

1.05 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

1.09 PROJECT CONDITIONS

- A. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Install at location required for box to serve intended purpose. Include installation within 10 feet (3 m) of location shown.

1.10 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate mounting heights, orientation, and locations of outlets mounted above counters, benches, and backsplashes.

PART 2 PRODUCTS**2.01 METAL CONDUIT**

- A. Manufacturers:
 - 1. Allied Tube & Conduit.
 - 2. EGS/Appleton Electric.
 - 3. Republic Conduit.
 - 4. Wheatland Tube Company.
 - 5. Substitutions: Section 01 60 00 - Product Requirements.
- B. Rigid Steel Conduit:
 - 1. Conforming to ANSI C80.1, FS WW-C-581 and UL 6.
 - 2. Heavy wall full mild steel.
 - 3. Threaded connections, hot dipped or electro-galvanized after cutting.
 - 4. Outside surfaces, including threads and couplings, to be hot dipped or electro galvanized or sherardized, conform to UL 514-B.
- C. Couplings, Fittings and Conduit Bodies: ANSI/NEMA FB 1; threaded, rigid steel fittings conforming to UL 6.
- D. Finished rigid metal conduit to have a label affixed indicating compliance with UL Standard No. 6.

2.02 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Manufacturers:
 - 1. AFC Cable Systems, Inc.
 - 2. Anamet Electrical, Inc.
 - 3. Carlon Electrical Products
 - 4. EGS/Appleton Electric.
 - 5. Southwire Company.
 - 6. Substitutions: Section 01 60 00 - Product Requirements.
- B. Product Description: Interlocked steel construction with PVC jacket.
- C. UL listed for use as equipment grounding conductor.

- E. Cover: Hinged.
- F. Connector: Slip-in.
- G. Finish: Rust inhibiting primer coating with gray enamel finish.

2.06 OUTLET BOXES

- A. Manufacturers:
 - 1. Allied Moulded Products, Inc.
 - 2. Carlon Electrical Products.
 - 3. RACO; Hubbell.
 - 4. Substitutions: Section 01 60 00 - Product Requirements.
- B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel, conforming to FS W-J-800.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch (13 mm) male fixture studs where required.
 - 2. Sheet Metal Outlet Boxes for Lighting Fixtures: Furnish octagonal boxes not less than 4 inches (100 mm).
 - 3. Other sheet metal outlet boxes: Furnish square boxes not less than 4 inches (100 mm).
 - 4. Covers: Of the same material and to fit the box.
 - 5. Concrete Ceiling Boxes: Concrete type.
 - 6. Multiple gangboxes: One piece construction.
- C. Nonmetallic Outlet Boxes: NEMA OS 2.
- D. Cast Metal Outlet Boxes: NEMA FB 1, Type FD, conforming to FS W-C-586.
 - 1. Material Galvanized cast metal aluminum, ferroalloy or malleable iron.
 - 2. Aluminum used for cast metal fittings to be copper free.
 - 3. Depth: 2-1/2 inches (63 mm) minimum.
 - 4. Furnish gasketed cover by box manufacturer. Cover of the same material designed to fit the box.
 - 5. Furnish threaded hubs.
 - 6. Include cover screws.
- E. Cast metal boxes to be copper free aluminum alloy, free from blowholes, shrinkage cracks, cold-shuts, blisters, or other defects. Warped or defective boxes will not be accepted.
- F. Boxes and covers to have machined joints. Drilling and tapping to be accurate. Provide clean cut, neoprene gaskets with boxes.
- G. Cover Screws: Copper-silicon alloy for cast iron boxes, stainless steel for cast aluminum boxes.
- H. Galvanizing: Cast iron boxes to be hot-dipped galvanized inside and outside. Surfaces to be smooth before galvanizing.

- B. Product Description: Galvanized cast metal or malleable iron conduit fittings conform to FS W-C-586. Aluminum used for cast metal fittings to be copper free. Cast metal or malleable iron outlet boxes to be at least 2-1/2 inches (63 mm) deep. Covers for fittings and outlet boxes to be of the same material, designed to fit the box or fitting, and complete with gaskets.
- C. Conduit couplings, elbows, and nipples to match specifications for the conduit.
- D. Locknuts, bushings, reducers, and similar conduit fittings to be galvanized, conforming to FS W-F-408.
- E. Insulating Bushings: Furnish malleable iron or steel insulating bushings with plastic inserts, or all plastic, high impact resistant type. Provide insulating bushings with UL temperature rating of 150 C and equipped with ground lugs where required.

2.09 EXPANSION FITTINGS

- A. Rigid Metal Expansion Couplings:
 - 1. Manufacturers:
 - A. O-Z/Gedney Co. Type EX
 - B. Crouse-Hinds Type XJ
 - C. Appleton Electric
 - D. Substitutions: per Section 01 60 00 – Material and Equipment
 - 2. Product Description: Expansion fittings with external bonding jumpers for ground continuity.
 - 3. Expansion couplings to provide 8 inch (200 mm) movement.
 - 4. Where installed with PVC coated conduit, provide PVC coated expansion couplings matching characteristics of the conduit.
- B. Deflection and Expansion Couplings:
 - 1. Manufacturers:
 - A. O-Z/Gedney
 - B. Crouse-Hinds
 - C. Appleton Electric
 - D. Substitutions: per Section 01 60 00 – Material and Equipment
 - 2. Product Description: Expansion deflection type consisting of molded neoprene sleeves with bonding jumpers passing through separate waterproof compartments, and two silicon bronze couplings.
 - 3. Permit a 3/4 inch (19 mm) expansion and contraction and a 3/4 inch (19 mm) deflection without deformation.

2.10 WALL SEALS

- A. Manufacturers:
 - 1. O-Z/Gendy
 - 2. Substitutions: per Section 01 60 00 – Material and Equipment
- B. Product Description: Wall seals having sealing assemblies on both sides of walls, and each body size to accept several different size sealing assemblies.

- F. Install sleeves and fireproofing in accordance with Section 26 05 29 – Hangers and Supports for Electrical Systems.
- G. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.04 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Install raceways concealed in floors, walls, ceilings, or underground, unless otherwise indicated or approved by Engineer.
- C. Increase conduit size shown on the plan to meet NFPA 70 conduit fill requirements for the conductors installed.
- D. Non-Metallic Conduit:
 - 1. Install non-metallic conduit in accordance with manufacturer's instructions.
 - 2. Join non-metallic conduit using cement as recommended by manufacturer.
 - 3. Wipe non-metallic conduit dry and clean before joining.
 - 4. Apply full even coat of cement to entire area inserted in fitting.
 - 5. Allow joint to cure for 20 minutes, minimum.
- E. Conduit Installed in Concrete:
 - 1. Do not embed electrical metallic tubing in concrete.
 - 2. Concrete-tight split couplings may be used in raceways embedded in concrete instead of union type couplings. After installation and before concrete is poured, demonstrate to Engineer that the installation has low resistance.
 - 3. Space and support raceways concealed in concrete so that they will not affect the structural strength or watertightness of the concrete.
 - 4. Place raceway in the approximate center of slabs, wall, and footings. Install raceways to insure no contact with reinforcing steel.
 - 5. Raceway that cannot be installed in the slab to be encased in concrete beneath the slab.
 - 6. Support the raceway to maintain location and spacing during concreting operations.
 - 7. Protect raceways in ground beneath slabs on grade on all sides by concrete not less than 3 inches (75 mm) thick. Extend structural expansion joints through raceway encasement.
- F. Raceway Routing:
 - 1. Route exposed raceway parallel and perpendicular to walls.
 - 2. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
 - 3. Make changes in direction of exposed conduit runs with symmetrical bends or cast metal conduit boxes.
 - 4. Route conduit in and under slab from point-to-point.

2. Do not use short radius bends unless approved by Engineer.
 3. Make field bends with approved hickies or conduit bending machines.
 4. For raceway containing fiber optic cable do not make bends shorter than 20 times the diameter of the fiber optic cable.
 5. Install no more than equivalent of three 90 degree bends (270 degrees total) between pull points. Install conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender to fabricate or factory elbows for bends in metal conduit larger than 2 inch (50 mm) size.
- P. If possible, slope raceways to drain to the nearest box or fitting. If not possible, provide other means for draining entrapped water.
- Q. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- R. Protect the conduit when mortar or other deleterious material used in the vicinity.
- S. Install suitable fittings to accommodate expansion and deflection where conduit crosses seismic, control and expansion joints.
1. Install rigid metallic expansion couplings for exposed conduit.
 2. Install deflection and expansion couplings for embedded conduit.
- T. Install pull string or cord in each empty conduit except sleeves and nipples.
- U. Install caps to protect installed conduit against entrance of dirt and moisture.

3.05 INSTALLATION - BOXES

- A. Size boxes to conform with NEC requirements, install larger boxes where indicated or to facilitate cable installation.
- B. Install electrical boxes in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- C. Unless otherwise indicated, install cast metal or malleable iron outlet, junction, and pull boxes for boxes less than 1,800 cu in (51 cu m):
1. Below grade floor elevation of structures, except fixture outlet boxes in ceilings.
 2. Exposed less than 7 ft (2 m) above the finished floor on floors above grade within a structure.
 3. Exposed to the weather including those installed flush with the outside surface of exterior walls. These boxes shall be NEMA 4.240
- D. Install cast outlet box in exterior locations, below grade within a structure and wet locations.
- E. Install wall mounted boxes at elevations to accommodate mounting heights as specified in section for outlet device.

- X. Large Pull Boxes: Boxes larger than 100 cubic inches (1,600 cubic centimeters) in volume or 12 inches (9300 mm) in any dimension.
 - 1. Interior Dry Locations: Use hinged enclosure.
 - 2. Other Locations: Use surface-mounted cast metal box.
 - 3. Covers: To be attached with stainless steel screws. Furnish two cast or pressed steel handles on covers heavier
- Y. Provide conduit hubs to terminate conduits at cast metal or malleable iron boxes which do not have integral hubs, and at steel enclosures or boxes located below grade floor elevation in structures.
- Z. Provide plates and covers on outlet boxes which do not have attached lighting fixtures.

3.06 INTERFACE WITH OTHER PRODUCTS

- A. Route conduit through roof openings for piping and ductwork or through suitable roof penetrations approved by the roofing manufacturer. Coordinate location with roofing installation.
- B. Locate outlet boxes to allow luminaires positioned as shown on Drawings or reflected ceiling plan.
- C. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
- D. Install explosion-proof sealing fittings at each penetration to classified areas.
- E. Install Type CGS sealing fitting in each conduit enclosing pump feeder and control cables.
- F. Coordinate locations of outlet boxes provided under Section 26 05 33 to obtain mounting heights specified and indicated on Drawings.
- G. Provide liquid tight flexible metal conduit no more than 3-feet (900 mm) long to connect motors, limit switches, solenoid valves, and other devices where vibration is possible and flexibility is desired. Fittings shall be approved for the purpose and, where required, shall include a method for terminating the bonding and grounding conductor, or a grounding conductor shall be installed in the raceways.
- H. Provide insulating bushings with grounding lugs on conduits terminating under medium voltage equipment, motor control centers, control panels, and similar equipment. Bond to equipment and system ground.
- I. Conduit hubs not integral with a box or fitting shall be malleable iron or stainless steel with nylon insulated throats. Hubs shall have positive grounding and shall be equipped with O-rings of neoprene for watertight installation.

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Labels.
 - 3. Wire and cable markers.
 - 4. Conduit/Raceway markers.
 - 5. Lockout Devices.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM)
- B. National Contractors Associations (NECA):
 - 1. NECA Standard of Installation
- C. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA 250 – Enclosures for Electrical Equipment (1,000 Volts Maximum)
- D. National Fire Protection Association (NFPA):
 - 1. NFPA 70 – National Electrical Code
- E. International Electrical Testing Association (NETA):
 - 1. ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems
- F. Underwriters Laboratories (UL): Applicable listings

1.03 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data:
 - 1. Submit manufacturer's catalog literature for each product required.
 - 2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.
- C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.04 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures: Requirements for submittals.

5. Engraved inscription: Black letters on white background

2.02 LABELS

- A. Labels: Embossed adhesive tape, with 3/16 inch (5 mm) black letters on white background.

2.03 WIRE MARKERS

- A. Manufacturers:
 1. Thomas & Betts Company
 2. Brady ID.
 3. Substitutions: Section 01 60 00 - Product Requirements
- B. Description: Vinyl or vinyl-cloth, self-adhesive, wraparound, cable/conductor markers with preprinted number and letters.
- C. Legend:
 1. Power and Lighting Circuits: Branch circuit or feeder number as indicated on Drawings.
 2. Control Circuits: Control wire number as indicated on schematic and interconnection diagrams or shop drawings.

2.04 CONDUIT AND RACEWAY MARKERS

- A. Manufacturers:
 1. Panduit Corporation, Pan-Steel.
 2. Substitutions: Section 01 60 00 - Product Requirements
- B. Product Description: Embossed stainless-steel marker plates to provide permanent identification with type MLT-H ties.

2.05 LOCKOUT DEVICES

- A. Lockout Hasps:
 1. Anodized aluminum hasp with erasable label surface; size minimum 7-¼ x 3 inches (184 x 75 mm).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Section 01 30 00 – Administrative Requirements: Coordination and project conditions.

3.02 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.03 INSTALLATION

- A. Section 01 45 00 – Quality Control: Manufacturer's instructions.

SECTION 26 29 23

VARIABLE-FREQUENCY DRIVES

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes variable frequency drives in standalone cabinets. **NOTE:** VFDs for use on this project will be supplied by the Owner (see Attachment to these specifications for information on the VFDs). Contractor will move VFDs from existing storage location into new locations.
- B. Related Sections:
 - 1. Section 26 05 26 – Grounding and Bonding for Electrical Systems.
 - 2. Section 26 05 29 – Hangers and Supports for Electrical Systems.
 - 3. Section 26 05 53 – Identification for Electrical Systems.

1.02 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
 - 1. ANSI/IEEE 519 – IEEE Guide for Harmonic Control and Reactive Compensation of Static Power Converters.
 - 2. ANSI/IEEE 597 – IEEE Practices and Requirements for General Purpose Thyristor DC Drives.
 - 3. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
- B. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 3. NEMA ICS 7 - Industrial Control and Systems: Adjustable Speed Drives.
 - 4. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable Speed Drive Systems.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. National Fire Protection Association (NFPA):
 - 1. NFPA 70 – National Electrical Code.
- E. Underwriters Laboratories (UL):
 - 1. UL 508C – Standard for Safety for Power Conversion Equipment.
 - 2. Applicable Listings.

- H. Manufacturer's Certification: Submit a signed statement from manufacturer's representative and addressed to Owner that the equipment has been properly installed and is in good working order.
- I. Manufacturer's Field Reports:
 - 1. Indicate start-up inspection findings.
 - 2. Indicate acceptance of installation.

1.04 CLOSEOUT SUBMITTALS

- A. Section 01 77 00 - Closeout Procedures: Closeout procedures.
- B. Project record documents: Accurately record actual installed equipment.
- C. Operation Data:
 - 1. Submit instructions complying with NEMA ICS 7.1.
 - 2. Include procedures for starting and operating controllers, and describe operating limits that may result in hazardous or unsafe conditions.
- D. Maintenance Data:
 - 1. Submit instructions complying with NEMA ICS 7.1.
 - 2. Drive Parameter Listing.
 - 3. Field Service Report from Drive Start-up Service.
 - 4. Include routine preventative maintenance schedule.
 - 5. Include trouble shooting and repair procedures.
 - 6. Identify system maintenance requirements, servicing cycles, lubrication types required and local spare parts sources. Include name and phone number for a local distributor for the spare parts.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of project.

1.06 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Products:
 - 1. Listed and classified by Underwriters Laboratories, Inc.
 - 2. Constructed to Underwriters Laboratories, Inc. Standard 508 and bear the label "ENCLOSED INDUSTRIAL CONTROL PANEL".

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Accept controllers on site in original packing. Inspect for damage.

2. Motor Nameplate Voltage: 460 volts, three phase, 60 Hertz.
 3. Displacement Power Factor: Between 1.0 and 0.95, lagging, over entire range of operating speed and load.
 4. Operating Ambient: 0 degrees C to 40 degrees C.
 5. Minimum Efficiency at Full Load: 96% percent.
 6. Output Voltage shall be adjustable from 0 to rated motor voltage.
 7. Operating Frequency range shall be from 0-120 Hz.
- D. Design Features:
1. Employ microprocessor-based inverter logic isolated from power circuits.
 2. Employ pulse-width-modulated inverter system.
 3. Design for ability to operate controller with motor disconnected from output.
 4. Design to attempt five automatic restarts following fault condition before locking out and requiring manual restart.
 5. Design to include running and starting output short circuit protection for line to line and line to ground faults.
- E. Hardware
1. Utilize diode or fully gated bridge on the input.
 2. Utilize line reactor on all ratings. Harmonic Filter encompasses line reactor.
 3. Utilize switching logic power supply operating from the DC bus.
 4. Incorporate phase to phase and phase to ground MOV protection.
 5. Utilize gold plated plug-in connections on printed circuit boards.
 6. Microprocessor based inverter logic shall be isolated from power circuits.
 7. Utilize latest generation inverter section.
 8. Inverter section shall not require commutation capacitors.
 9. Employ operator interface common for all horsepower ratings. Interface shall include a LCD digital display, programming keypad and operator key options.
 10. Main Control Board shall be common for all ratings.
 11. Control connection shall be common for all ratings.
 12. Common Node Capacitors available on all frames.
- F. Control Logic:
1. Ability to operate a drive with motor disconnected.
 2. Provide a controlled shut down, when properly fused, with no component failure in the event of an output phase to phase or phase to ground short circuit. Provide annunciation of the fault condition.
 3. Utilize an adjustable PWM carrier frequency within a range of 1-6kHz.
 4. Provide either Selectable Sensorless Vector or V/Hz modes.
 5. The drive shall be suitable for use on either normal duty or heavy-duty loads. If specified for normal duty, the drive shall provide 110 percent overload capability for up to one minute and 150 percent overload capability for up to three seconds. If specified for heavy duty, the drive shall provide 150 percent overload capability for up to one minute and 180 percent overload capability for up to three seconds.

1. Programming capability shall allow the user to produce speed profiles with linear acceleration/deceleration or “S-Curve” profiles that provide changing acceleration/deceleration rates.
 2. S-Curve profiles shall be adjustable.
- F. Adjustments:
1. A digital interface shall be used for all set-up, operation and adjustment settings.
 2. All adjustment shall be stored in nonvolatile memory (EEPROM).
 3. No potentiometer adjustments shall be required.
 4. The drive shall provide EEPROM memory for factory default values.
- G. Process PI Control:
1. The drive shall incorporate an internal process PI regulator with proportional and integral gain adjustments as well as error inversion and output clamping functions.
 2. The feedback shall be configurable for normal or square root functions. If the feedback indicates that the process is moving away from the setpoint, the regulator shall adjust the drive output until the feedback equals the reference.
 3. Process control shall be capable of being enabled or disabled with a hardwire input. Transitioning in and out of process control shall be capable of being tuned for faster response by preloading the integrator.
 4. Protection shall be provided for a loss of feedback or reference signal.
- H. Fault Reset / Run:
1. The drive shall provide up to nine automatic fault reset and restarts following a fault condition before locking out and requiring manual restart.
 2. The automatic mode shall not be applicable to a ground fault, shorted output faults or other internal microprocessor faults.
 3. The time between restarts shall be adjustable from 0.5 seconds to 30 seconds.
- I. Skip Frequencies:
1. Three adjustable set points that lock out continuous operation at frequencies which may produce mechanical resonance shall be provided.
 2. The set points shall have a bandwidth adjustable from 0 Hz to 60 Hz.
- J. Run on Power Up:
1. A user programmable restart function shall be provided to automatically restart the equipment after restoration of power after an outage.
- K. Inertial Ride Through:
1. The drive shall respond to a loss of AC input power by adjusting the output frequency to create a regenerative situation in the motor.
 2. The regenerated energy shall recapture the mechanical energy and convert it to electrical energy that shall power the drive logic during the power outage.
 3. The drive shall retain control of the motor during the power outage.

3. The Input / Output board shall have the following analog inputs as minimum. Furnish all I/O required by the Contract Documents.
 - a. Quantity one (1) differentially isolated plus or minus 10V (bipolar) / 20mA, 9 bit plus sign, 10V common mode noise rejection.
 - b. Quantity one (1) differentially isolated plus or minus 10 V (bipolar) / 20 mA, 9 bit plus sign, 160V common mode noise rejection.
 - c. Analog inputs shall be user programmable for a variety of uses including frequency command and process loop input. Analog inputs shall be user programmable for function scaling (including invert), offset, signal loss detect and square root.
 4. The Input / Output board shall have the following analog outputs as a minimum. Furnish all I/O required by the Contract Documents.
 - a. Quantity one (1) differentially isolated plus or minus 10V (bipolar) / 20mA, 9 bit plus sign.
 - b. The analog output shall be user programmable to be proportional to one of fourteen process parameters including output frequency, output current, encoder feedback, output power.
 - c. Programming shall be available to select either absolute or signed values of these parameters.
 5. The Input / Output board shall have the following digital inputs as minimum. Furnish all I/O required by the Contract Documents.
 - a. Quantity of six (6) digital inputs rated 115Vac.
 - b. All inputs shall be individually programmable for functions from a list of thirty-one (31) that includes Start, Run, Stop, External Fault, Speed Select, Jog and Process PI function.
 6. The Input / Output board shall have the following digital outputs as minimum. Furnish all I/O required by the Contract Document.
 - a. Quantity of two (2) relay outputs, from C (1 N.O. – 1 N.C.).
 - b. Contact output ratings shall be 115Vac.
 - c. Relays shall be programmable to twenty-eight (28) different conditions including Fault, Alarm, At Speed, Drive Ready and PI Excess Error.
 - d. Timers shall be available for each output to control the amount of time, after the occurring even, that the output relay actually changes state.
- S. Reference Signals:
1. The drive shall be capable of using the following input reference signals:
 - a. Analog inputs.
 - b. Preset speeds.
 - c. Remote potentiometer.
 - d. Digital MOP.
 - e. Human Interface.
 - f. Communication module commands.
- T. Loss of Reference:
1. The drive shall be capable of sensing the following reference loss conditions.

6. Acceleration Rate Adjustment: 0.5 - 30 seconds.
7. Deceleration Rate Adjustment: 1 - 30 seconds.
8. HAND-OFF-AUTO selector switch with bumpless transfer and manual speed control.
9. Manual Start and Stop pushbuttons and manual speed control.
10. Control Power Source: Integral control transformer.

Y. Safeties and Interlocks:

1. Include undervoltage release.
2. Door Interlocks: Mechanical means to prevent opening of equipment with power connected, or to disconnect power when door is opened; include means for defeating interlock by qualified persons.
3. Safety Interlocks: Terminals for remote contact to inhibit starting under both manual and automatic mode.
4. Control Interlocks:
 - a. Furnish terminals for remote contact to allow starting in automatic mode.
 - b. Furnish terminals to accept controller shutdown signal from the following: motor temperature; motor bearing temperature; motor vibration switch; pump temperature; pump vibration switch; and pump bearing temperature. Indicate shutdown signal status.
5. Emergency Stop: Use dynamic brakes for emergency stop function.
6. Disconnecting Means: Integral circuit breaker on line side of each controller. Provide external operator with provisions for padlocking in the OFF position.
7. Receive and install pump/motor protection devices furnished by pump/motor manufacturer.

Z. Fabrication:

1. Wiring Terminations: Match conductor materials and sizes as indicated on Drawings.
2. Enclosure: NEMA 250, Type 1, suitable for equipment application.
3. Finish: Manufacturer's standard enamel.

2.03 TRANSIENT VOLTAGE SUPPRESSION DEVICES

A. Manufacturers:

1. Allen-Bradley
2. Eaton Cutler-Hammer
3. Schneider Electric/Square D
4. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: IEEE C62.41, factory-mounted transient voltage surge suppressor, selected to meet requirements for medium exposure and to coordinate with system circuit voltage.

2.04 UNIVERSAL HARMONIC FILTER

A. Manufacturers:

1. TCI
2. MTE

- M. All wiring shall be copper.
- N. Insulation Class: 220 degrees C system. Temperature rise: 130 degrees C.
- O. Anti-vibration pads shall be used between the reactor or transformer core and the enclosure.
- P. Filter shall be enclosed within the VFD Equipment Line up as shown on plans.
- Q. The harmonic mitigation equipment shall be handled, stored, and installed in accordance with the manufacturer's recommended installation practices as found in the installation, operation, and maintenance manual. Installation shall comply with all applicable codes.
- R. If capacitors require to be switched off at low motor speeds, filter manufacturer shall provide a contactor in the filter enclosure to be switched by the VFD.

2.05 SOURCE QUALITY CONTROL

- A. Section 01 45 00 – Quality Control: Manufacturer quality control.
- B. Shop inspect and perform standard productions tests for each controller.
- C. Make completed controllers available for inspection at manufacturer's factory prior to packaging for shipment. Notify Engineer at least seven days before inspection is allowed.
- D. Allow witnessing of factory inspections and tests at manufacturer's test facility. Notify Engineer at least seven days before inspections and tests are scheduled.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify surface is suitable for controller installation.
- C. Verify building environment is maintained within service conditions required by manufacturer.
- D. Verify that field measurements are as indicated on shop drawings and clearances are as instructed by manufacturer.

3.02 INSTALLATION

- A. Section 01 45 00 – Quality Control: Manufacturer's instructions.
- B. Install control where indicated, in accordance with manufacturer's written instructions and in accordance with NEMA ICS 7.1.

- G. Inspect completed installation for physical damage, proper alignment, anchorage, and grounding.
- H. After installation and a reasonable run-in period and before final inspection, test the units in the presence of Engineer.
- I. Provide all instruments, test equipment and personnel required for the test.
- J. Record in increments of 5 Hz from minimum to maximum speed:
 - 1. Input Kilowatts.
 - 2. Amperes in each phase.
 - 3. All line to line and line to neutral voltages.
 - 4. Input Power Factor.
 - 5. Drive input and output cooling air temperature.
 - 6. Room temperature.
 - 7. Input and output waveform with harmonic content analysis.
 - 8. Waveform at the feeder bus with harmonic content analysis.
 - 9. Other items as recommended by the drive manufacturer.
- K. Test alarm and shutdown circuits by simulating conditions.
- L. Submit 3 copies of a certified test report of all test to Engineer.

3.04 MANUFACTURER'S FIELD SERVICES

- A. Section 01 45 00 - Quality Control: Manufacturer's field services.
- B. Prepare and startup variable frequency drives.

3.05 ADJUSTING

- A. Make final adjustments to installed controller to assure proper operation of load system. Obtain performance requirements from installer of driven loads.

3.06 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.

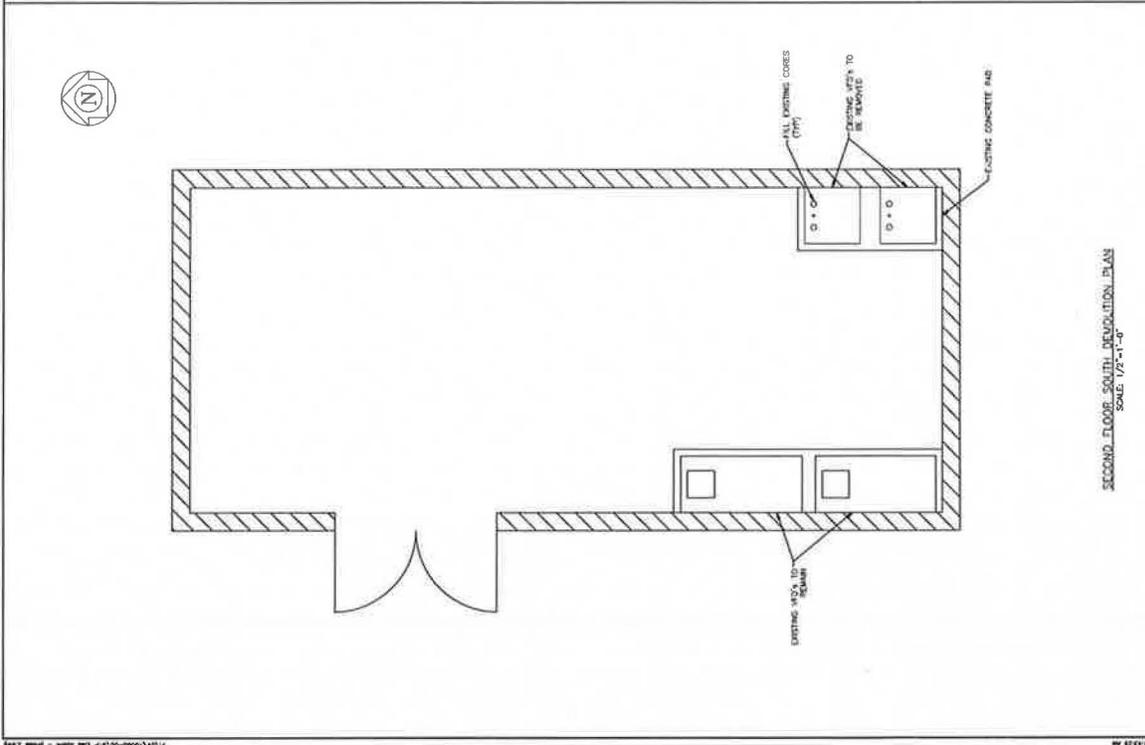
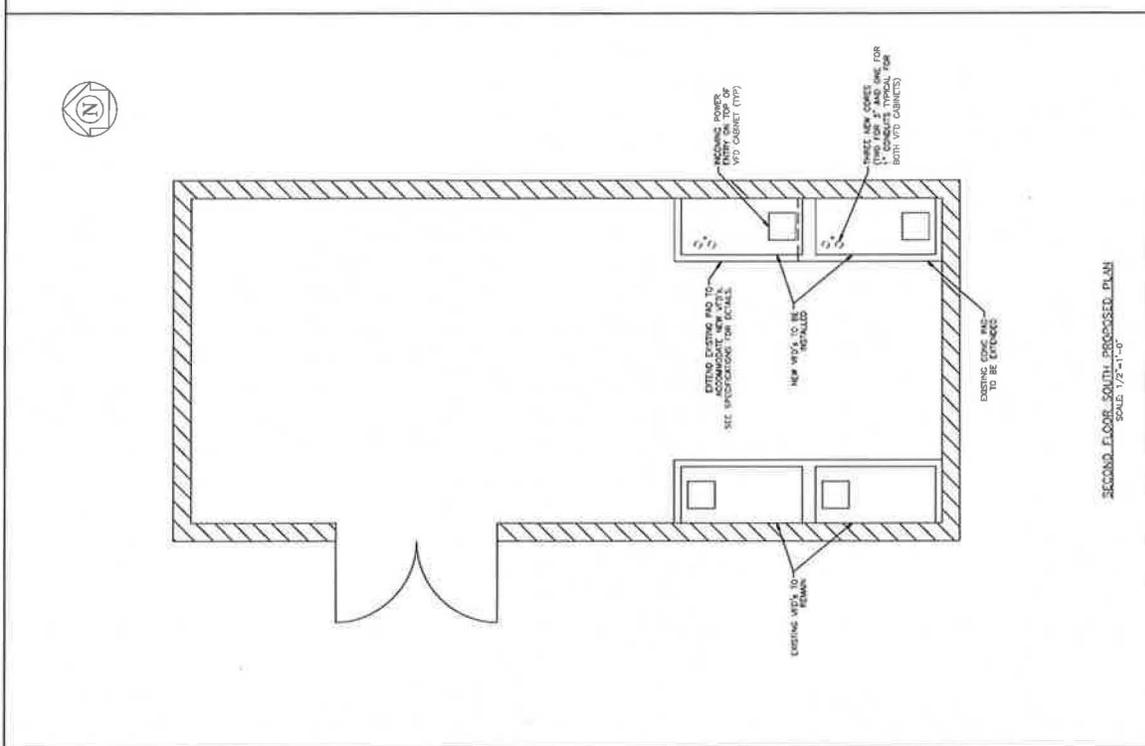
3.07 DEMONSTRATION AND TRAINING

- A. Furnish 8 hours of instruction total for two plant ground, to be conducted at project site with manufacturer's representative, one at startup and one after six months of operation.
- B. Demonstrate operation of controllers in automatic and manual modes.
- C. The basis of the training shall be the variable frequency drive, the engineered drawings and the user manual. At a minimum, the training shall:
 - 1. Review of the engineered drawings identifying the components shown on the drawings.
 - 2. Review starting/stopping and speed control options for the controller.

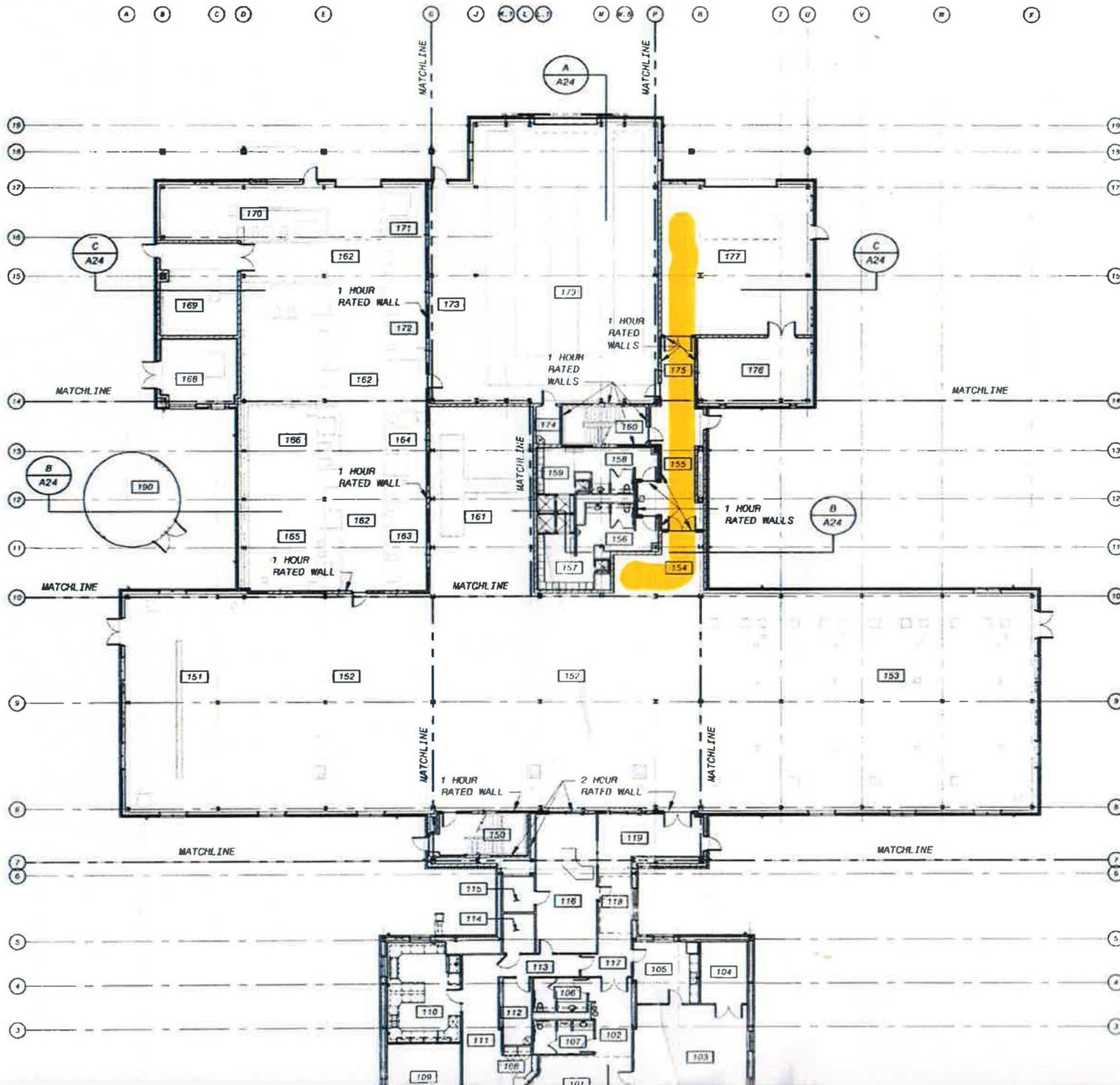
CITY OF GENEVA
WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2

APPENDIX A: PLANS

- PROJECT NOTES:**
- CONTRACTOR TO VERIFY FIELD CONDITIONS AND COORDINATE ANY INSTALLATIONS WITH THE OWNER AND THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
 - ONLY ONE VFD CAN BE DOWN AT A TIME DURING CONSTRUCTION. COORDINATE WITH OWNER FOR OUTAGES. REMOVE, INSTALL, TEST, AND PUT INTO SERVICE ONE VFD BEFORE TAKING DOWN THE OTHER VFD.
 - FLOOR CORES AND CONDUIT/RISE ROUTING SHOWN UNLESS OTHERWISE NOTED. CONTRACTOR TO VERIFY LOCATIONS, SIZES AND DEPTHS.
 - REMOVE ALL VFD CABLES, THE TOP PORTION OF 24" x 36" x 1 1/2" AND 36" x 36" x 1 1/2" CONCRETE SLABS AND 2" x 2" x 1/2" AND 2" x 2" x 1/2" OF FLOOR. EXISTING CONTROL CABLES ARE 1/4" x 1/4" AND 3/8" x 3/8" OF FLOOR. FOR RISES, DISCONNECT AND REMOVE EXISTING FLEXIBLE CONDUIT FOR RISES. DISCONNECT AND REMOVE EXISTING FLEXIBLE CONDUIT FOR RISES.
 - SPACE EXISTING POWER AND CONTROL CABLES WITH NEW CABLES IN NEW VFD JUNCTION BOXES. EXISTING R/P/D PANS SHALL BE REMOVED. NEW R/P/D PANS SHALL BE INSTALLED FROM TERMINAL STRIPS TO NEW VFD CABINETS. NEW VFD CABINETS SHALL BE INSTALLED THROUGH THE TOP ENTRY WITH NEW FLEXIBLE CONDUIT.
 - THE FLOOR SLAB OF THE VFD ROOM IS 1 FEET ABOVE FINISHED FLOOR LEVEL. NEW VFD CABINETS SHALL BE INSTALLED IN THAT LOWER LEVEL. THAT WILL NEED TO BE REMOVED AND RECONSTRUCTED FOR WORK TO BE DONE.
 - REMOVE ALL EXISTING VFD CABLES AND ROLL BACK FOR TESTING. DISCONNECT EXISTING CABLES AND ROLL BACK FOR TESTING. DISCONNECT AND REMOVE ANY FLEXIBLE CONDUIT.
 - SPACE EXISTING POWER AND CONTROL CABLES WITH NEW CABLES IN NEW VFD JUNCTION BOXES. EXISTING R/P/D PANS SHALL BE REMOVED. NEW R/P/D PANS SHALL BE INSTALLED FROM TERMINAL STRIPS TO NEW VFD CABINETS THROUGH NEW FLOOR JUNCTION BOXES TO NEW VFD CABINETS THROUGH NEW FLOOR CORES INTO BOTTOM ENTRY WITH NEW RIGID GALVANIZED CONDUIT.



DEUCHLER INC. (CORPORATE) (COMMERCIAL) (RESIDENTIAL)		ENGINEER 200 WOODEN WALKER P.O. BOX 202-203 FARMINGTON, MO 64241	DATE: 07-14-11 DRAWN: AS SHOWN CHECKED: 10-11-2009-JC FIELD BOOK NO: N/A	SHEET NO: 1 OF: 1
CITY OF GENEVA, ILLINOIS WATER TREATMENT PLANT VFD REPLACEMENT - PHASE 2		PROJECT NO: 07-11-11-11 SHEET NO: 1 OF: 1	SCALE: 1/2" = 1'-0"	TITLE: EQUIPMENT PAD REINFORCING



SPA	
ROOM No.	ROOM
100	VESTIBULE
101	LOBBY
102	LOBBY HALLWAY
103	TRAINING ROOM
104	STORAGE
105	LUNCH ROOM
106	WOMEN
107	MEN
108	RECEPTION
109	MANAGERS OFFICE
110	LABORATORY
111	WORK AREA
112	JANITOR
113	HALLWAY
114	ELECTRICAL EQUIPM
115	SERVERS
116	CONTROL ROOM
117	VIEWING HALLWAY
118	VIEWING HALLWAY
119	VIEWING HALLWAY
120	STAIR NO. 1
121	CARTRIDGE FILTER
122	REVERSE OSMOSIS
123	REVERSE OSMOSIS
124	PRESSURE FILTERS
125	ACCESS AISLE
126	CORRIDOR
127	MEN RESTROOM
128	WOMEN RESTROOM
129	WOMEN LOCKER ROOM
130	STAIRWAY
131	CIP ROOM
132	CHEMICAL FEED AI
133	ANTISCALANT FEED
134	CITRIC ACID FEED
135	CORROSION INHIBI
136	SODIUM HYDROXIDU
137	SODIUM HYPOCHLO
138	DECARBONATOR BL
139	FLUORIDE STORAGE
140	SULFURIC ACID ST
141	SODIUM BISULFITE
142	CAUSTIC DETERGEN
143	HIGH SERVICE PAN
144	JANITOR
145	CORRIDOR
146	STORAGE
147	GARAGE
148	DECARBONATOR BL

FOR CONTINUATION, SEE SHEET A19

OUT TO OUT OF GIRTS = 62'-8"

STAIR NO. 2

204

203

FOR ENLARGED PLAN
SEE SHEET A32

C VTR
A19 TYPICAL

2
A27

4
A27

3
A27

2
A25

Floor Hatch

OUT TO OUT OF GIRTS = 107'-0"

6 SIM
A30

EQUIPMENT ROOM

202

FILTER
VENT C
A18

B
AK2

6
A30

7
A30

STAIR NO. 1

201

D
201

D
202

ELECTRICAL EQUIPMENT

203

2
A25

FOR ENLARGED PLAN
SEE SHEET A32

5
A31

5 SIM
A31

OUT TO OUT OF GIRTS = 62'-8"

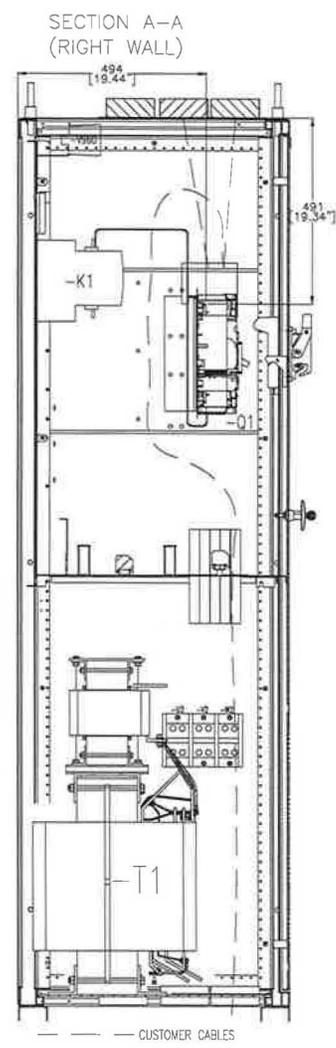
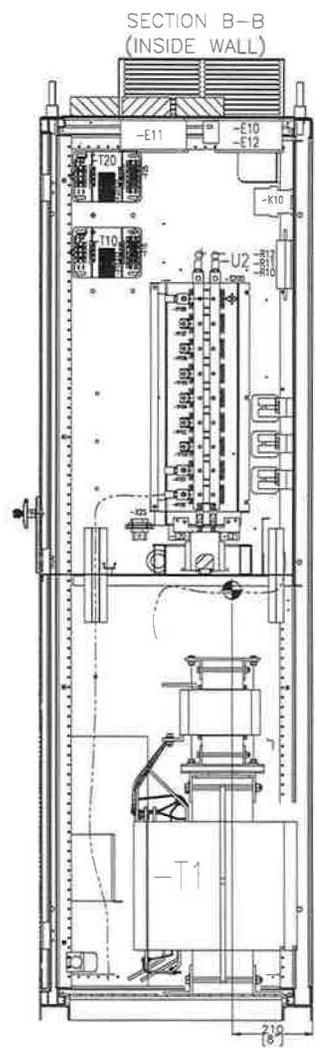
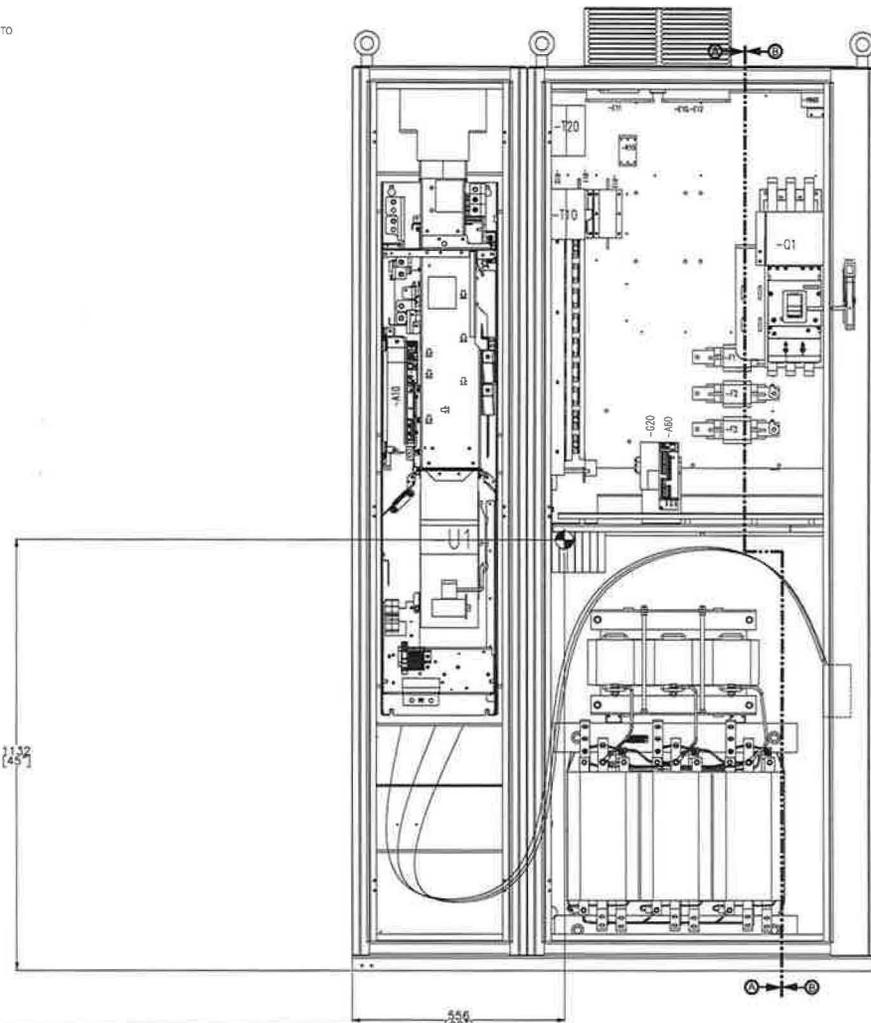
CITY OF GENEVA
WATER TREATMENT PLANT VFD REPLACEMENT – PHASE 2

APPENDIX B: NEW VFD INFORMATION

NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES] UNLESS SPECIFIED OTHERWISE.
2. LAYOUT SHOWS MAXIMUM COMPONENT SIZE WITH ALL SUPPLIED OPTIONS. ACTUAL COMPONENT SIZE MAY BE SMALLER.
3. REMOVE OR PUNCH THROUGH REMOVABLE PLATES TO ROUTE THE CABLES.
4. REFER TO PAGE 3 FOR DETAIL ON THE DIVIDER CONTROL PANEL.

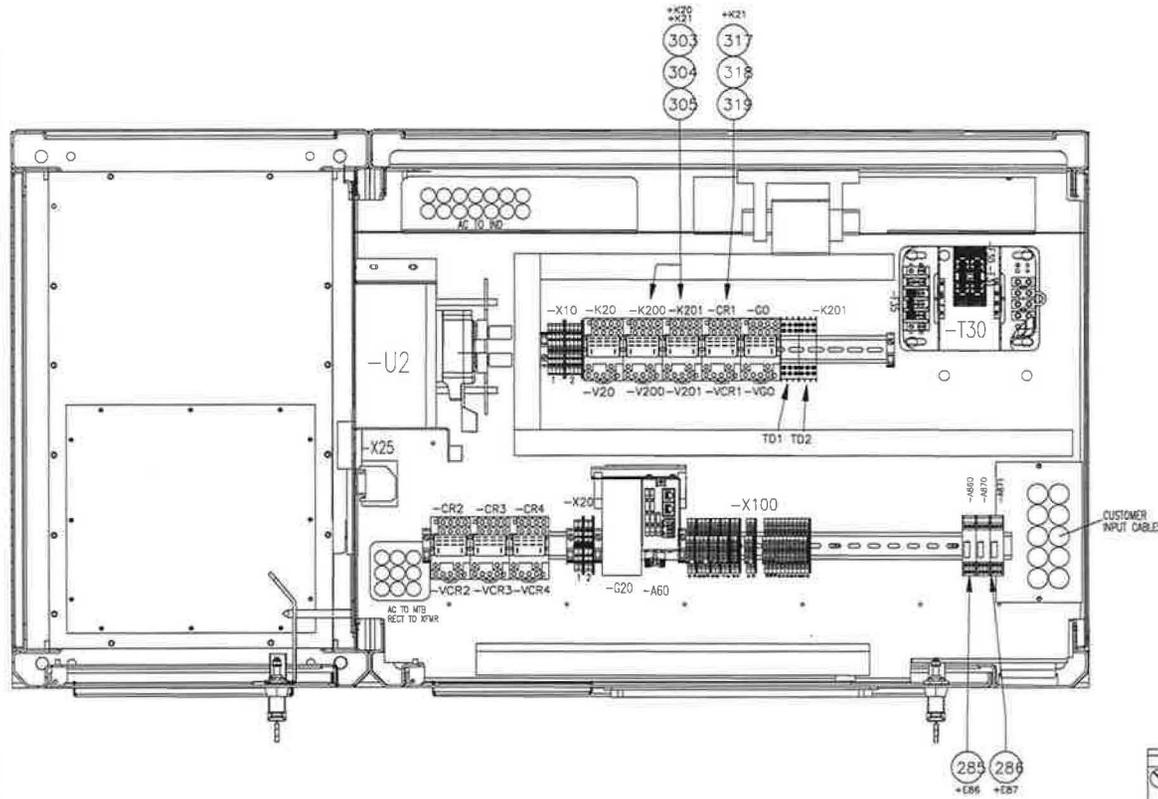
☉ - CENTER OF GRAVITY



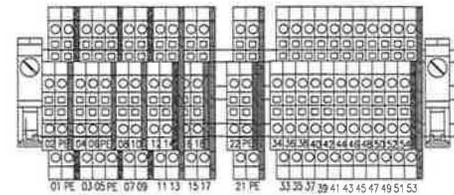
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ISS	DATE	DESCRIPTION	DWN	CHK	APR	ISS	DATE	DESCRIPTION	DWN	CHK	APR	THIRD ANGLE PROJ	CUSTOMER: CITY OF GENEVA CUST. ORDER NO.: 06222021 SII ORDER NO.: 3009071907	Siemens Industry, Inc. Confidential Property of Process Industries and Drives	ROS.3
AA	06/25/21	INITIAL RELEASE		PMT	MRA	PMT						W150CP OUTLINE DRAWING; INTERIOR VIEWS FRAME SIZE G1 CABINET LAYOUT 310 AMPS; 250HP	SIZE B DRAWING/PART NO. 3009071907-101-L	SHEET 02	CONT 03

CONTROL PANEL DETAIL

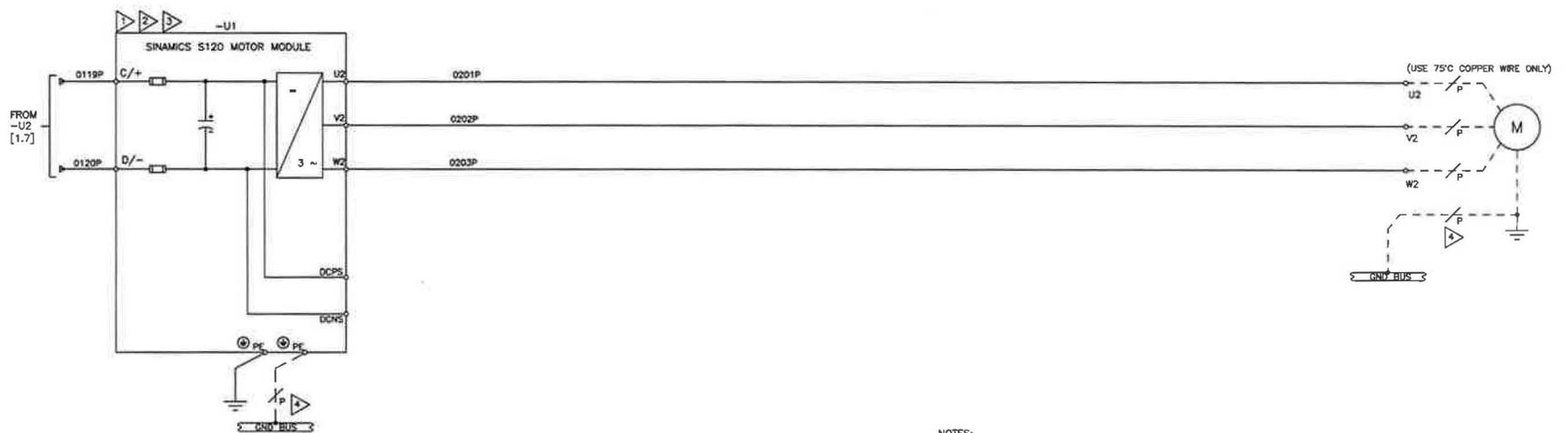


-X100 DETAIL



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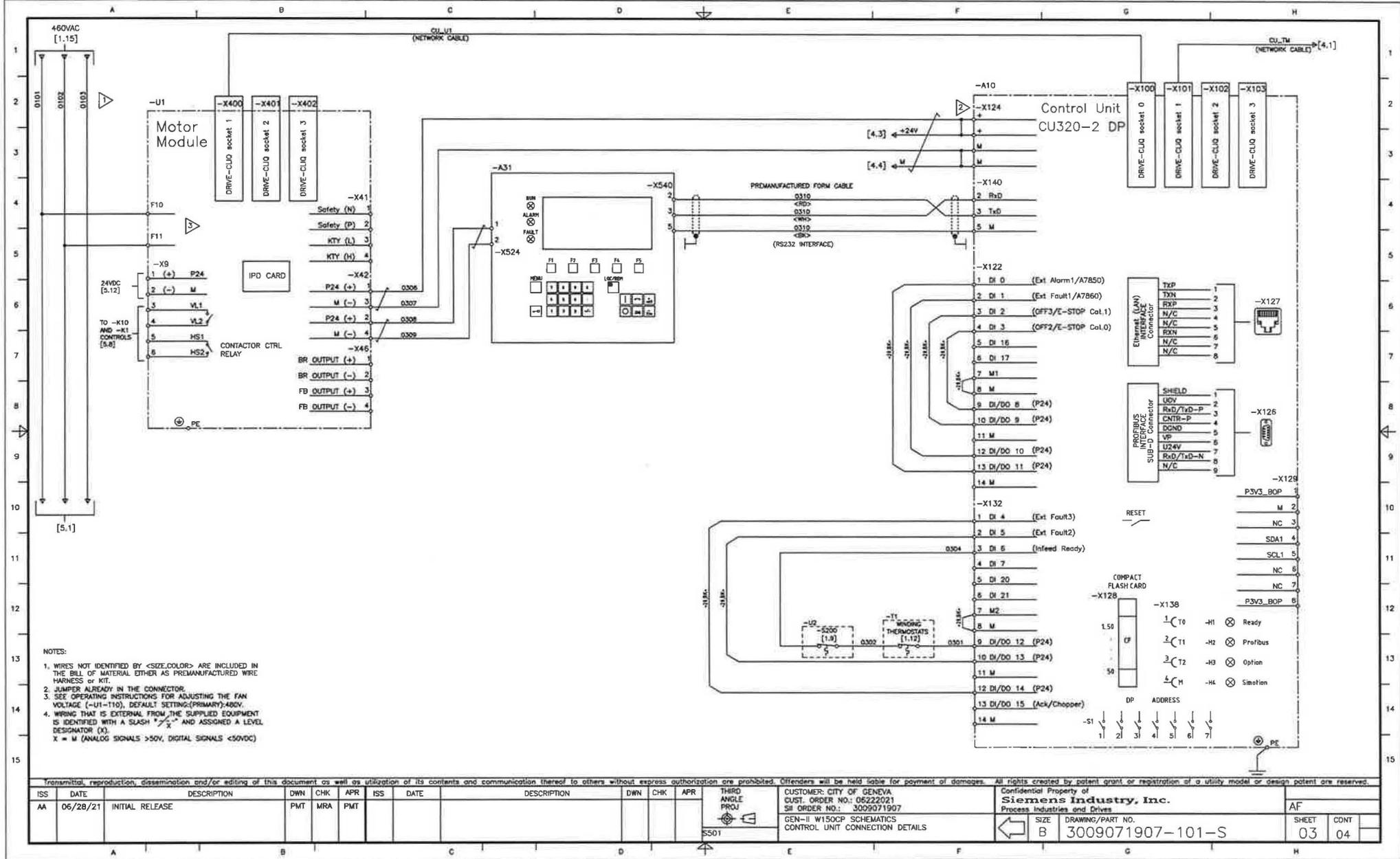
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AA	06/26/21	INITIAL RELEASE	PMT	MRA	PMT								W150CP OUTLINE DRAWING: CONTROL PANELS FRAME SIZE: G1 CONTROLS LAYOUT 310 AMPS; 250HP	SIZE B DRAWING/PART NO. 3009071907-101-L	SHEET 03 CONT FNL



NOTES:

1. WIRES NOT IDENTIFIED BY <SIZE,COLOR> ARE INCLUDED IN THE BILL OF MATERIAL EITHER AS PREMANUFACTURED WIRE HARNESS or KIT.
2. LETTER "B" OR "D" OR "M" AT THE END OF THE POWER CABLE SIZE REFERS TO FOLLOWING.
 B = CLASS B "CODE" CABLE, BK
 D = 2KV DLO "FLEX" CABLE, BK
 M = MTW/HKUP "FLEX" CABLE, BK
 EXAMPLE: CABLE <4/0,B> IS 4/0 CLASS B 600V CODE CABLE.
3. SUFFIX "P" AT THE END OF THE WIRE NUMBER INDICATES POWER CIRCUIT CABLE.
4. WIRING THAT IS EXTERNAL FROM THE SUPPLIED EQUIPMENT IS IDENTIFIED WITH A SLASH "/X" AND ASSIGNED A LEVEL DESIGNATOR (X).
- X = L (ANALOG SIGNALS <50V, DIGITAL SIGNALS <15V)
 M (ANALOG SIGNALS >50V, DIGITAL SIGNALS <50VDC)
 H (DIGITAL SIGNALS >50VDC, AC/DC CONTROL CIRCUITS)
 P (AC/DC POWER CIRCUITS)

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ISS	DATE	DESCRIPTION	DWN	CHK	APR	ISS	DATE	DESCRIPTION	DWN	CHK	APR	THIRD ANGLE PROJ	CUSTOMER: CITY OF GENEVA CUST. ORDER NO.: 06222021 SII ORDER NO.: 3009071907	Confidential Property of Siemens Industry, Inc. Process Industries and Drive	AF
AA	06/28/21	INITIAL RELEASE	PMT	MRA	PMT							S501	GEN-II W150CP SCHEMATICS 480VAC POWER CONNECTION DETAILS	SIZE B DRAWING/PART NO. 3009071907-101-S	SHEET 02 CONT 03



- NOTES:
1. WIRES NOT IDENTIFIED BY <SIZE,COLOR> ARE INCLUDED IN THE BILL OF MATERIAL EITHER AS PREMANUFACTURED WIRE HARNESS OR KIT.
 2. JUMPER ALREADY IN THE CONNECTOR.
 3. SEE OPERATING INSTRUCTIONS FOR ADJUSTING THE FAN VOLTAGE (-U1-T10), DEFAULT SETTING:(PRIMARY):460V.
 4. WIRING THAT IS EXTERNAL FROM THE SUPPLIED EQUIPMENT IS IDENTIFIED WITH A SLASH "/>" AND ASSIGNED A LEVEL DESIGNATOR (X).
X = M (ANALOG SIGNALS >50V, DIGITAL SIGNALS <50VDC)

ISS	DATE	DESCRIPTION	DWN	CHK	APR	ISS	DATE	DESCRIPTION	DWN	CHK	APR
AA	06/28/21	INITIAL RELEASE	PMT	MRA	PMT						

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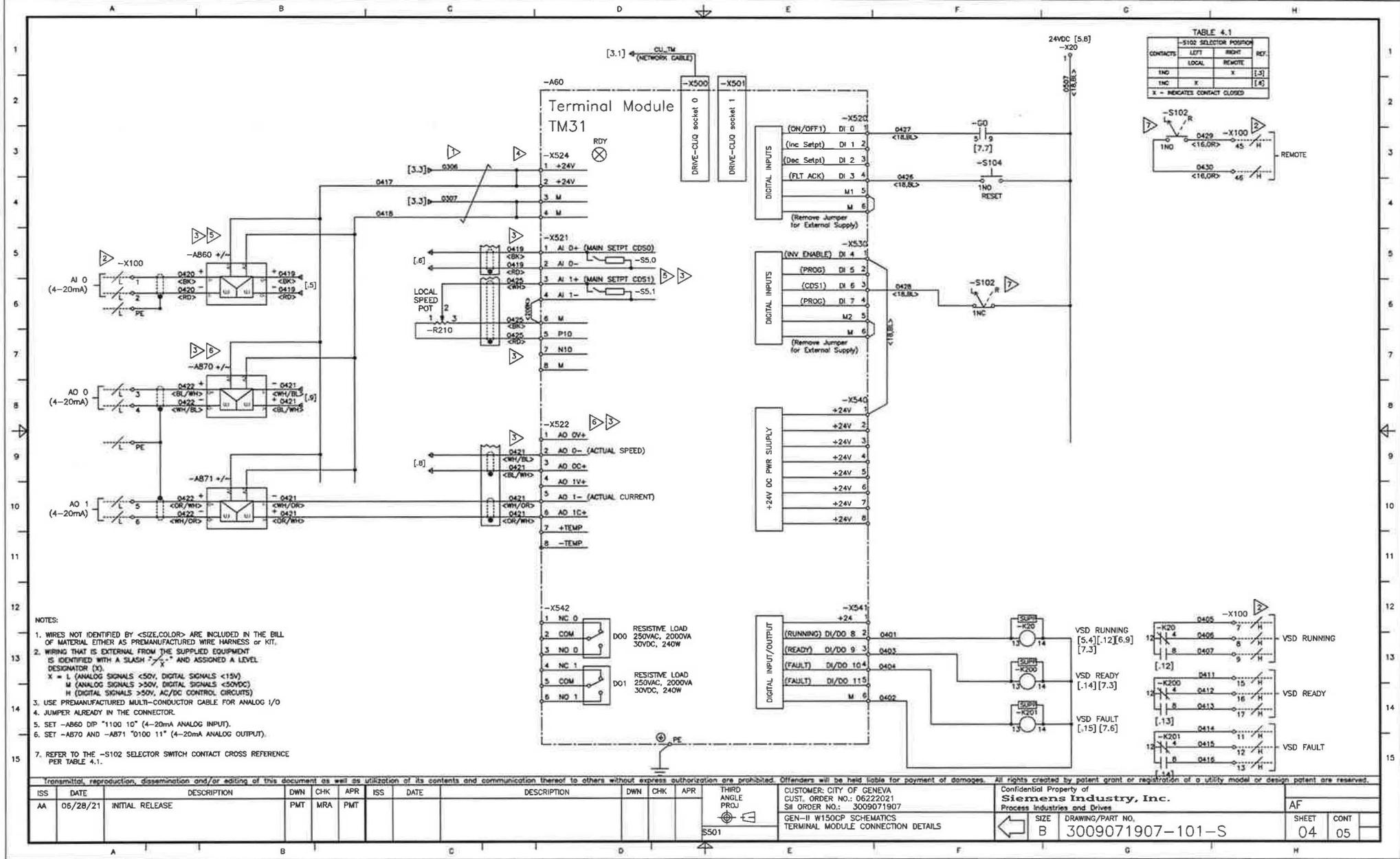
Customer: CITY OF GENEVA
 CUST. ORDER NO.: 06222021
 SI ORDER NO.: 3009071907

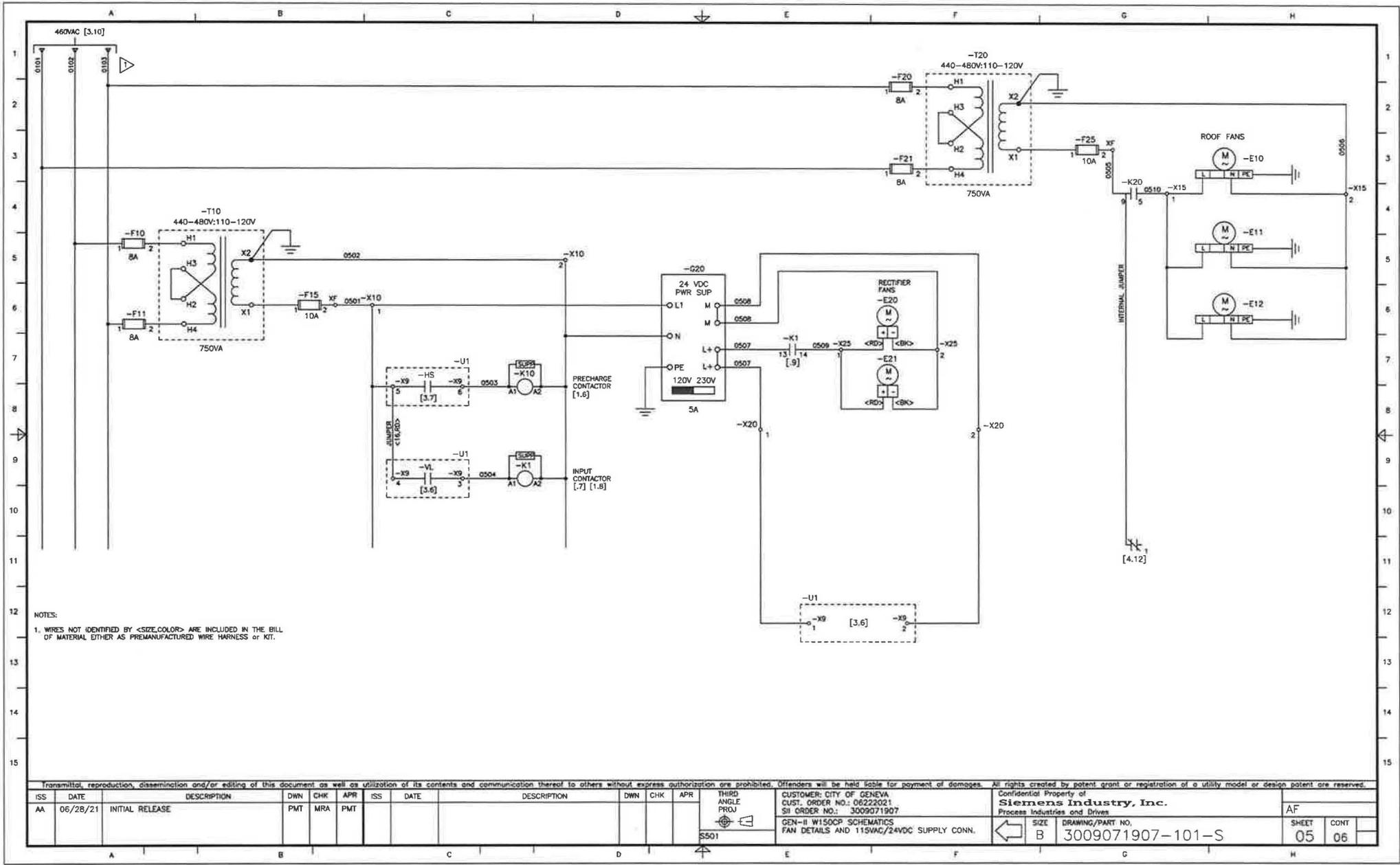
GEN-II W150CP SCHEMATICS
 CONTROL UNIT CONNECTION DETAILS

Siemens Industry, Inc.
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SIZE B DRAWING/PART NO. 3009071907-101-S

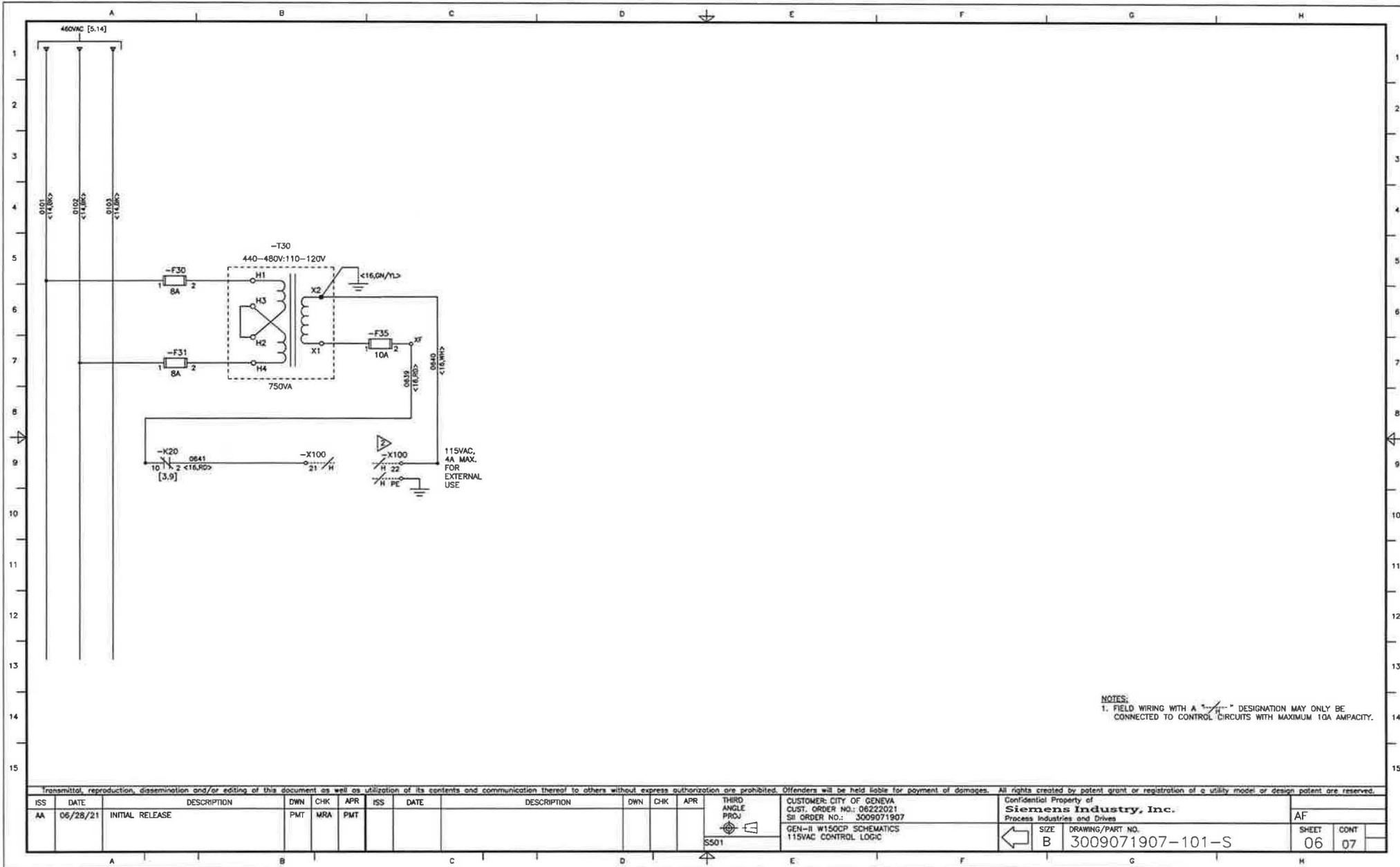
AF SHEET 03 CONT 04





NOTES:
 1. WIRES NOT IDENTIFIED BY <SIZE,COLOR> ARE INCLUDED IN THE BILL OF MATERIAL EITHER AS PREMANUFACTURED WIRE HARNESS or KIT.

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AA	06/28/21	INITIAL RELEASE		PMT	MRA	PMT						SS01	GEN-II W150CP SCHEMATICS FAN DETAILS AND 115VAC/24VDC SUPPLY CONN.	SIZE B DRAWING/PART NO. 3009071907-101-S	SHEET 05 CONT 06



NOTES:
 1. FIELD WIRING WITH A "H" DESIGNATION MAY ONLY BE CONNECTED TO CONTROL CIRCUITS WITH MAXIMUM 10A AMPACITY.

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AA	06/26/21	INITIAL RELEASE	PMT	MRA	PMT								GEN-II W150CP SCHEMATICS 115VAC CONTROL LOGIC	SIZE B DRAWING/PART NO. 3009071907-101-S	SHEET 06 CONT 07

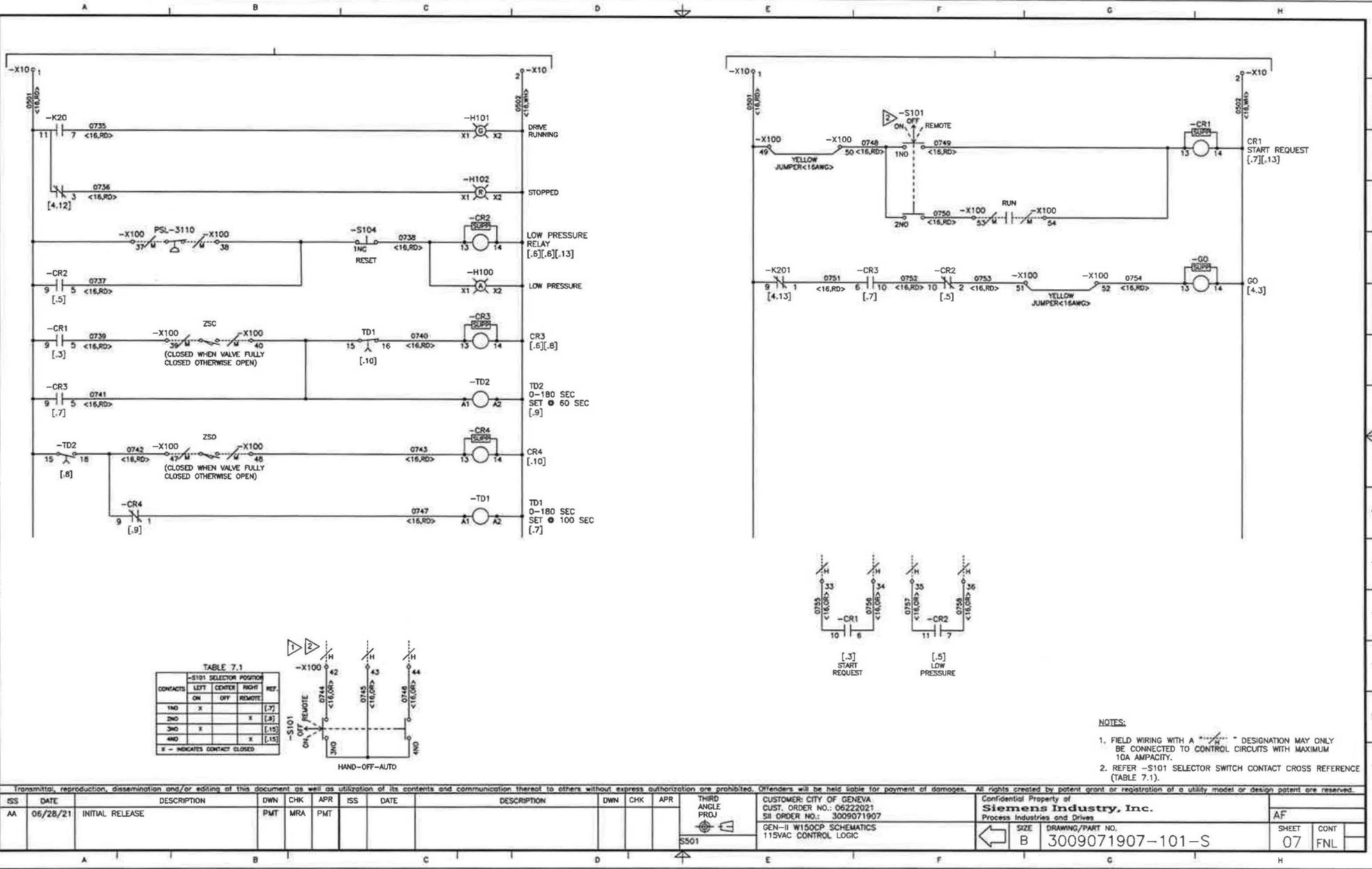
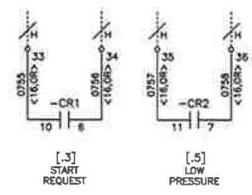
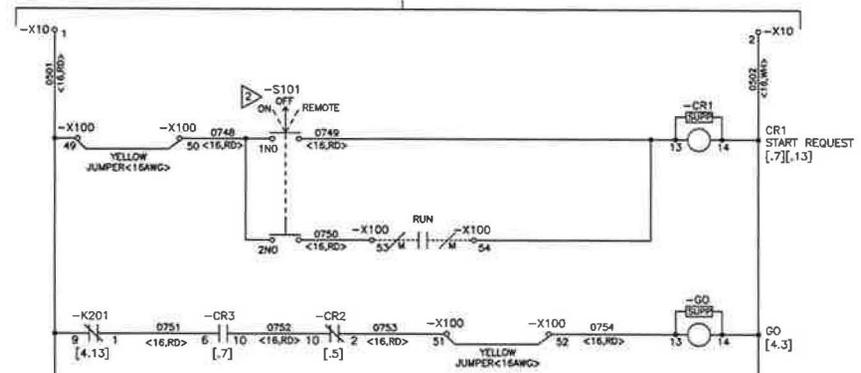
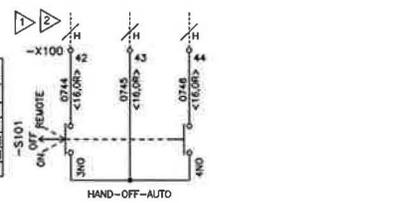


TABLE 7.1

CONTACTS	-S101 SELECTOR POSITION			REF.
	LEFT	CENTER	RIGHT	
1NO	X			[.7]
2NO			X	[.8]
3NO	X			[.13]
4NO			X	[.13]

X - INDICATES CONTACT CLOSED



- NOTES:
1. FIELD WIRING WITH A "H" DESIGNATION MAY ONLY BE CONNECTED TO CONTROL CIRCUITS WITH MAXIMUM 10A AMPACITY.
 2. REFER -S101 SELECTOR SWITCH CONTACT CROSS REFERENCE (TABLE 7.1).

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ISS	DATE	DESCRIPTION	DWN	CHK	APR	ISS	DATE	DESCRIPTION	DWN	CHK	APR	THIRD ANGLE PROJ	SIZE	DRAWING/PART NO.	SHEET	CONT
AA	06/28/21	INITIAL RELEASE		PMT	MRA	PMT							B	3009071907-101-S	07	FNL



