

ONEIDA COUNTY DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

SPECIFICATIONS
FOR
BID REFERENCE No. 2306

MURNANE FIELD TURF CONVERSION
898 ROSE PLACE
UTICA, NEW YORK 13502

BID PACKAGES:

GENERAL CONSTRUCTION: CONTRACT No. H2459301
ELECTRICAL CONSTRUCTION: CONTRACT No. H2459302

NOVEMBER 8, 2024

IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER OR ARCHITECT, TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY.

PREPARED BY
CHA CONSULTING, INC
3 WINNERS CIRCLE, ALBANY, NEW YORK 12205

ANTHONY J. PICENTE, JR.
ONEIDA COUNTY EXECUTIVE

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ADVERTISEMENT - INVITATION TO BID

Sealed Bids, subject to the conditions contained herein, will be received by the ONEIDA COUNTY DEPARTMENT OF PURCHASING until **10:30 AM local time on Wednesday, November 27, 2024**, and then publicly opened and read, for furnishing all labor and materials and performing all work for:

Bid Reference No. 2306
Murnane Field Turf Conversion
898 Rose Place
Utica, New York 13502
General Construction: Contract No. H2459301
Electrical Construction: Contract No. H2459302

Specifications and plans must be obtained from Oneida County Purchasing Department, 800 Park Avenue, Utica, New York 13501. Obtaining bid documents via mail is strongly recommended. Contact the Oneida County Purchasing Department at (315) 798-5880 to coordinate mail delivery. A deposit of One Hundred Dollars (\$100.00) will be required for each set. If plans and specifications are delivered via mail, then a Vendor FedEx or UPS account number for shipping must be supplied with the deposit check. Cash deposits will not be accepted. Also required is Federal ID Number or Social Security Number at time of purchase. All deposit checks are to be made payable to the COUNTY OF ONEIDA. A refund will be made, in the amount of One Hundred Dollars (\$100.00), to bidder(s) or Fifty Dollars (\$50.00) to non-Bidders, for the return of all the sets in good condition within (30) days of award or rejection of Bids.

Bids must be submitted upon the proposal form(s) furnished in the Proposal Booklet and must not be detached from the Proposal Booklet. A deposit in the amount of 5% of the base bid will be required and is subject to the conditions provided in the Instruction to Bidders. This deposit shall consist of a bid bond or certified check payable to the COUNTY OF ONEIDA. Failure to submit a bid bond or certified check with bid will result in automatic disqualification of bid. Failure to submit a bid upon the proposal form(s) furnished by the Oneida County Purchasing Department or submittal of form(s) detached from the Proposal Booklet will result in automatic disqualification of bid.

A Performance Bond will be required, and for an amount not less than 100% of bid price.

A pre-bid meeting will be held on-site at Murnane Field, 898 Rose Place, Utica, New York 13502 on **Thursday, November 14, 2024, at 10:30 AM**. All bidders attending the pre-bid meeting shall meet at the Main Gate.

Packages containing bids must be sealed, marked, and addressed to **Oneida County Department of Purchasing, 800 Park Avenue, Utica, New York 13501**. Also mark on the envelope or package, the bid reference number, and the type of work for which the proposal is submitted.

The Owner reserves the right to revise or amend the bidding documents prior to the date set for opening bids. Such revisions and amendments, if any, will be announced by addenda to the advertisement. Any inquiries regarding details on specifications must be directed in writing to: Oneida County Department of Public Works, Deputy Commissioner of Engineering, 5999 Judd Road, Oriskany, New York 13424. The owner also reserves the right to waive any irregularity and reject any or all bids received.

The County of Oneida, in order to promote its established Affirmative Action Plan, invites sealed bids from minority groups. This Affirmative Action Policy regarding sealed bids and contracts applies to all persons without regard to race, color, national origin, age, sex, or handicap.

This contract is subject to compliance with Article 8 of the New York State Labor Law regarding prevailing rate of wages. On all public work projects of at least \$250,000.00, all laborers, workers and mechanics working on the site, shall be certified as having successfully completed the OSHA 10-hour construction safety and health course.

No Bidder may withdraw his bid within forty-five (45) days after the date set for the opening thereof.

The Bidding Documents may be examined at the following locations:

Mohawk Valley Builders Exchange, 10 Main Street, Suite 202, Whitesboro, New York 13492

Dodge Reports, 231 Salina Meadows, Suite 130, Syracuse, New York 13212

Syracuse Builders Exchange, 6563 Ridings Road, Syracuse, New York 13206

Oneida County Department of Public Works, 5999 Judd Road, Oriskany, New York 13424

Alfred A. Barbato
Director of Purchasing
November 8, 2024

INSTRUCTIONS TO BIDDERS

The following documents are referenced herein or shall be referenced in any contract resulting from this Invitation to Bid. Bidders are encouraged to purchase and review copies of these documents.

1. Instructions to Bidders - AIA Document A701 - 2018, Modified by Owner
2. Owner - Contactor Agreement - AIA Document A101 - 2017, Modified by Owner
3. General Conditions of the Contract - AIA Document A201 - 2017, Modified by Owner
4. Bid Bond - AIA Document A310

The following documents shall be submitted with the successful Bidder's final payment request:

1. Contractor's Affidavit of Payment of Debts and Claims - AIA Document G706
2. Contractor's Affidavit of Release of Liens - AIA Document G706A
3. Consent of Surety to Final Payment - AIA Document G707
4. Compliance With Labor Rates Declaration (Example format included in the Specifications)
5. Guarantee Declaration (Example format included in the Specifications)

All documents listed above are available for inspection only at the Oneida County Department of Public Works, 5999 Judd Road, Oriskany, New York, 13424.



AIA® Document A701® – 2018

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

Bid Reference Number 2306
Murnane Field Turf Conversion
898 Rose Place
Utica, New York 13502

THE OWNER:
(Name, legal status, address, and other information)

Oneida County
800 Park Avenue
Utica, New York 13501

THE ARCHITECT:
(Name, legal status, address, and other information)

CHA Consulting, Inc
3 Winners Circle
Albany, New York 12205

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ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner’s Instructions to the Architect, Parts A and B will be completed prior to using this document.

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

Bidding Documents shall be obtained from the Oneida County Purchasing Department, 6th Floor, 800 Park Avenue, Utica, New York 13501.

§ 3.1.2 A refund will be made, in the amount of One Hundred Dollars (\$100.00) to Bidder(s) or Fifty Dollars (\$50.00) to Non-Bidder(s), for the return of all the sets in good condition within thirty (30) days of award or rejection of Bids.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Owner at least seven days prior to the date for receipt of Bids.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

Deputy Commissioner of Engineering
Oneida County Department of Public Works
5999 Judd Road
Oriskany, New York 13424
publicworks@ocgov.net

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

Email

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than two (2) days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Paragraph Deleted

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

Bid Bond or Certified Check payable to Oneida County in the amount of five percent (5%) of the base bid.

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning forty-five (45) days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

Paper Copy

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be attached to the bid documents.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

Bid Rank

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Paragraph Deleted

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 Article Deleted
(Paragraphs deleted)

DRAFT AIA® Document A101™ – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

THIS AGREEMENT, Bid Reference Number 2306 / Contract Number H245930(X), made as of the «
» day of «
» in the year «Two Thousand Twenty-Four.»
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«Oneida County»
«800 Park Avenue»
«Utica, New York 13501»

and the Contractor:
(Name, legal status, address and other information)

«TBD»
«
»
«
»
«
»

for the following Project:
(Name, location and detailed description)

«Bid Reference Number 2306
Murnane Field Turf Conversion»
«898 Rose Place
Utica, New York 13502»

The Architect:
(Name, legal status, address and other information)

«CHA Consulting, Inc»
«3 Winners Circle»
«Albany, New York 12205»

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

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

The parties should complete A101™-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

- Not later than () calendar days from the date of commencement of the Work.
- By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor’s performance of the Contract. The Contract Sum shall be (\$), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
Alternate GC-1	
Alternate GC-2	
Alternate GC-3	
Alternate GC-4	
Alternate GC-5	
Alternate GC-6	
Alternate GC-7	
Alternate GC-8	

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
Alternate GC-1		
Alternate GC-2		
Alternate GC-3		
Alternate GC-4		
Alternate GC-5		
Alternate GC-6		
Alternate GC-7		
Alternate GC-8		

§ 4.3 Allowances, if any, included in the Contract Sum: (Identify each allowance.)

Item	Price
Field Directed Work Allowance	GC: \$50,000.00 and EC: \$10,000.00.

§ 4.4 Unit prices, if any: (Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
None		

§ 4.5 Liquidated damages, if any: (Insert terms and conditions for liquidated damages, if any.)

« »

§ 4.6 Other: (Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

« »

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the «Fifteenth» day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the «Thirtieth» day of the «following» month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than «Ninety» («90») days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

«5%»

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

« »

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

« »

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

« »

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

« »

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

«Statutory» % «per annum»

§ 5.4 Non-Appropriation Clause

§ 5.4.1 The Owner shall have no liability or obligation under the Contract to the Contractor, or to anyone else, beyond the annual funds appropriate and available thereto.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« »

« »

« »

« »

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

[« »] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[«X»] New York State Court of competent jurisdiction sitting in Oneida County, New York or in the United States District Court for the Northern District of New York.

[« »] Other *(Specify)*

« »

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

« »

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:
(Name, address, email address, and other information)

«Commissioner of Public Works»
«Oneida County Department of Public Works»
«5999 Judd Road»
«Oriskany, New York 13424»

§ 8.3 The Contractor’s representative:
(Name, address, email address, and other information)

«TBD»

« »

« »

« »

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 Assumption of Risk

§ 8.5.1.1 The Contractor solely assumes the following risks. The risk of unforeseen obstacles and difficulties in the prosecution of the Work covered by the Contract, whether such risks are within or beyond the control of the Contractor and whether such risks involve a legal duty, primary or otherwise, imposed upon the County. The risk of loss or damage, direct or indirect, to any equipment, tools, materials or property furnished, used, installed or received by the County, the Contractor, or any subcontractor, performing services or furnishing materials for the Work covered hereunder.

§ 8.5.1.2 To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold the County, Architect, and Construction Manager harmless against any and all claims (including but not limited to claims asserted by any employee of the Contractor and/or its subcontractor) and costs and expenses of whatever kind (including but not limited to payment or reimbursement of attorneys' fees and disbursements) allegedly arising out of or in any way related to the risks it assumes under this Section, operations of the Contractor and its subcontractor(s) in the performance of the Contract or from the Contractor's and/or its subcontractor's failure to comply with any of the provisions of the Contract or of the law. Such costs and expenses shall include all those incurred in defending the underlying claim and those incurred in connection with the enforcement of this Article by way of cross-claim, third-party claim, declaratory action, or otherwise.

§ 8.5.1.3 Neither the termination of the Contract nor the making of the final payment shall release the Contractor from its obligations under this Article. The enumeration elsewhere in the Contract of particular risks assumed by the Contractor or of particular claims for which it is responsible shall not be deemed to limit the effect of the provision of this Section or to imply that it assumes or is responsible for only risks or claims of the type enumerated.

§ 8.5.1.4 This assumption of risk by the Contractor is absolute, excepting only reckless or intentional acts of the County, or their officers, agents or employees.

§ 8.5.2 Contractor shall, at its own expense, purchase and maintain insurance of the following types of coverage and limits of liability with an insurance carrier qualified and admitted to do business in the State of New York. The insurance carrier must have at least an A- (excellent) rating by A. M. Best.

§ 8.5.2.1 Commercial General Liability (CGL) coverage with limits of not less than One Million Dollars (\$1,000,000) each occurrence, and Two Million Dollars (\$2,000,000) Annual Aggregate. CGL coverage shall be written on ISO Occurrence form CG 00 01 0413, or a substitute form, providing equivalent coverage and shall cover liability arising from premises, operations, XCU, independent contracts, products, pollution, completed operations, personal and advertising injury. There shall be no exclusions to Contractual Liability for Employee Injuries (i.e. Labor Law Exclusions). The Owner and Architect shall be included as an additional insured, on a on a primary and non-contributing basis before any other insurance or self- insurance, including any deductible or self-insured retention, maintained by, or provided to, the additional insured. The Contactor shall maintain said CGL coverage for itself and the additional insured for the duration of the Contract Period and maintain completed operations coverage for itself and the additional insured for at least three (3) years after completion.

§ 8.5.2.2 Workers' Compensation and Employer's Liability, pursuant to statutory limits.

§ 8.5.2.3 Business Automobile Liability with limits of at least One Million Dollars (\$1,000,000) each accident. Coverage must include liability arising out of all owned, leased, hired, and non-owned automobiles. The Owner and Architect shall be included as an additional insured, on a on a primary and non-contributing basis before any other insurance or self- insurance, including any deductible or self-insured retention, maintained by, or provided to, the additional insured.

§ 8.5.2.4 Excess/Commercial Umbrella coverage with limits of at least Five Million Dollars (\$5,000,000). The Owner and Architect shall be included as an additional insured. Excess/Commercial Umbrella coverage for such additional insured shall apply as primary and non-contributing before any other insurance or self-insurance, including any deductible or self-insured retention, maintained by or provided to the additional insured.

§ 8.5.2.5 Owners and Contractors Protective Liability Insurance in the amount of not less than One Million Dollars (\$1,000,000) per occurrence and One Million Dollars (\$1,000,000) annual aggregate. The Contractor agrees to have this policy in the Owner's name.

§ 8.5.2.6 The Contractor shall purchase and maintain property insurance written on an Installation Floater with "All Risk" or equivalent coverage form in the amount equal or greater than the value of material to be installed included in this contract, plus the value of subsequent contract modifications and cost of materials supplied or installed by others, comprising the total value at the site. Coverage shall be at Replacement Cost and the Contractor will be responsible for any deductibles associated with this coverage. This property insurance shall cover portions of the work stored off the jobsite and also portions of the work in transit

§ 8.5.2.7 The Owner shall not issue a notice to proceed until certificates evidencing the insurance required by this Section has been provided to the Owner. The certificates shall be on forms approved by the Owner, and Contractor where the basis shall contain a provision that coverage afforded under the policies will not be canceled or allowed to expire until at least thirty (30) days prior written notice has been given to the Owner. Acceptance of the certificates shall not relieve the Contractor of any of the insurance requirements, nor decrease the liability of the Contractor. The Owner reserves the right to require the Contractor to provide insurance policies for review by the Owner. The Contractor grants the Owner a limited power of attorney to communicate with the Contractor's insurance provider and/or agent for the express purpose of confirming the coverages required hereunder.

§ 8.5.3 The Contractor waives all rights against the Owner and its agents, officers, and employees for recovery of damages to the extent these damages are covered by a policy of insurance maintained per the requirements stated above.

§ 8.5.4 The insurance provisions of Section 8.5 of this Agreement supersede any provisions regarding the same topic stated in any other Contract Document.

§ 8.5.5 A Performance Bond and a Labor and Material Payment Bond shall be submitted by the Contractor. Each bond shall be in the amount of One Hundred Percent (100%) of the amount of the Contract and shall make reference to the Contract. The bonds shall be purchased, at the Contractor's expense, from one or more companies licensed to do business in the State of New York. Said bonds shall not be transferable.

§ 8.5.5.1 The bonds shall be on the form supplied by the County or a form approved by the County. The Contractor shall require the attorney-in-fact that executes the required bonds on behalf of the surety, to affix thereto a certified and current copy of the Power of Attorney. The Contractor shall deliver the required bonds to the County no later than three (3) days following the date this Agreement is executed.

§ 8.5.5.2 The Contractor shall deliver the required bonds to the Owner before final execution of this Agreement.

§ 8.5.5.3 The Contractor shall require the attorney in fact that executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

§ 8.5.5. The Contractor shall purchase and maintain insurance as set forth in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201-2017, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203-2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

<< >>

§ 8.7 Other provisions:

<< >>

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor as modified by Owner.
- .2 Deleted.
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction as modified by Owner.
- .4 Deleted.
- .5 Drawings

Number	Title	Date
All Sheets	Bid Reference Number 2306 Murnane Field Turf Conversion 898 Rose Place Utica, New York 13502	November 8, 2024

- .6 Specifications

Section	Title	Date	Pages
All	Bid Reference Number 2306 Murnane Field Turf Conversion 898 Rose Place Utica, New York 13502	November 8, 2024	TBD

- .7 Addenda, if any:

Number	Date	Pages
TBD		

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

- .8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

The Sustainability Plan:

Title	Date	Pages

Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
Exhibit A	Addendum - Standard Oneida County Conditions	November 8, 2018	12

.9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

«Proposal Booklet for Bid Reference Number 2306 signed TBD, 2024 by the Contractor, consisting of 14 pages, and attached hereto as Exhibit B.»

ARTICLE 10 INDEMNIFICATION

§ 10.1 The obligations of the Contractor under this section shall survive any expiration or termination of the Contract and shall not be limited by any enumeration herein of required insurance coverage.

§ 10.2 To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold the Owner, the Architect, their officers, agents and employees (the "Indemnitees"), harmless against any and all claims (including but not limited to claims asserted by any employee of the Contractor and/or its Subcontractors) and costs and expenses of whatever kind (including but not limited to payment or reimbursement of attorneys' fees and disbursements) allegedly arising out of or in any way related to the risks it assumes under this Article 10, operations of the Contractor and/or its Subcontractors in the performance of the Contract or from the Contractor's and/or its Subcontractors' failure to comply with any of the provisions of the Contract or of the law. Such costs and expenses shall include all those incurred in defending the underlying claim and those incurred in connection with the enforcement of this paragraph by way of cross-claim, third-party claim, declaratory action or otherwise. The parties expressly agree that the indemnification obligation hereunder contemplates (1) full indemnity in the event of liability imposed against the Indemnitees without negligence and solely by reason of statute, operation of Law or otherwise; and (2) partial indemnity in the event of any actual negligence on the part of the Indemnitees either causing or contributing to the underlying claim (in which case, indemnification will be limited to any liability imposed over and above that percentage attributable to actual fault whether by statute, by operation of Law, or otherwise). Where partial indemnity is provided hereunder, all costs and expenses shall be indemnified on a pro rata basis.

ARTICLE 11 INDEPENDENT CONTRACTOR STATUS

§ 11.1 For the purposes of this paragraph, the term "Contractor" shall be broadly construed to include the Contractor, and any and all of its Subcontractors, agents, servants, officers, and employees. It is expressly agreed that the relationship of the Contractor to the Owner shall be that of an Independent Contractor. The Contractor shall not be deemed an employee of the Owner for any purpose including, but not limited to, claims for unemployment insurance, workers' compensation, retirement, or health benefits. The Contractor, as an independent contractor, covenants and agrees that it will conduct itself in accordance with such status, that it will neither hold itself out as, nor claim to be, an officer or employee of the Owner by reason thereof and that it shall not make any claim, demand or application to or for any right or privilege applicable to an officer or employee of the Owner. Both the Owner and the Contractor shall have the right to participate in any conference, discussion or negotiation with any governmental agency regarding the Contractor's status as an independent contractor.

§ 11.2 The Owner shall not make any withholding for taxes or any other obligations. The Contractor shall be solely responsible for all applicable taxes, payroll deductions, workers' compensation insurance, and provision of health insurance where required. The Contractor shall indemnify and hold the Owner harmless from all loss or liability incurred by the Owner as a result of the Owner not making such payments or withholdings.

ARTICLE 12 ADVICE OF COUNSEL

§ 12.1 Each party acknowledges that, in executing this Agreement, such party has had the opportunity to seek the advice of independent legal counsel, and has read and understood all of the terms and provisions of the Contract.

ARTICLE 13 AUTHORITY TO ACT/SIGN

§ 13.1 The Contractor's signatory hereby represents, warrants, personally guarantees and certifies that he has the power and authority to execute and deliver this Agreement and to carry out the obligations hereunder. The execution and delivery by Contractor's signatory of this Agreement and the consummation of the transactions contemplated herein have been duly authorized by the Contractor; no other action on the part of the Contractor or any other person or entity is necessary to authorize the Contractor's signatory to enter into the Contract, or to consummate the transactions contemplated herein.

ARTICLE 14 SEVERABILITY

§ 14.1 If any provision of the Contract is or becomes void or unenforceable by force or operation of law, the parties agree that the Contract shall be reformed to replace the stricken provision with a valid and enforceable provision that comes as close as possible to expressing the intention of the parties. Further, the parties agree that all other provisions shall remain valid and enforceable.

ARTICLE 15 COUNTERPARTS

§ 15.1 This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, and all of which together shall be deemed one and the same instrument.

ARTICLE 16 ORDER OF PRECEDENCE

§ 16.1 Conflicts among the Contract Documents shall be resolved in the following order of precedence:

- § 16.1.1 Addendum - Standard Oneida County Conditions
- § 16.1.2 Any Contract Amendments, in reverse chronological order
- § 16.1.3 This Agreement
- § 16.1.4 Addenda to the Specifications
- § 16.1.5 Specifications
- § 16.1.6 Addenda to the Drawings
- § 16.1.7 Drawings
- § 16.1.8 AIA Document A201-2017 as modified
- § 16.1.9 Proposal Book for Bid Reference Number 2049

ARTICLE 17 SUBCONTRACTORS

§ 17.1 Subcontracting by the Contractor without the prior consent of the Owner shall be considered null and void from its inception. The Contractor shall have written agreements with each Subcontractor that requires compliance with the insurance and indemnification provisions stated in this Agreement. A Subcontractor shall maintain policies of insurance identical to that required of the Contractor, and shall assume the same duties and risks undertaken by the Contractor in the Contract. The insurance certificates of the Subcontractor must list the Owner as an additional insured, on a primary, noncontributory basis. No Subcontractor shall perform any portion of the Work until receiving approval by the Owner. The Contractor shall be solely responsible for providing the Work and for complying with the provisions of the Contract, and any Owner- approved subcontracting shall not alter any obligations thereof.

ARTICLE 18 REQUIRED PROVISIONS OF LAW

§ 18.1 In performing the Contract, all applicable governmental laws, regulations, orders, ordinances and other rules of duly constituted authorities will be followed and complied with in all respects by the parties. In particular the Contractor shall fully comply with the following Sections of the Labor Law:

- § 18.1.1 Labor Law Section 220-e relating to Prohibition Against Discrimination and Equal Opportunity.
- § 18.1.2 Prevention of Dust Hazards required by Labor Law Section 222-a.
- § 18.1.3 Labor Law Sections 220 and 220-d, Minimum Wage Rates and Supplements.

§ 18.2 This is a public work contract covered by Article 8 of the Labor Law. Therefore, neither the Contractor's employees nor the employees of its Subcontractors may be required or permitted to work more than the number of hours and days provided in the Labor Law, and as set forth in the prevailing wage and supplement schedules issued by the State Labor Department. Furthermore, the Contractor and its Subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the State Labor Department in accordance with the Labor Law. Additionally, pursuant to Article 8 of the Labor Law, the Contractor understands and agrees that the filing of payrolls in a manner consistent with Subdivision 3-a of Section 220 of the Labor Law shall be a condition precedent to payment by the Owner of any Owner approved sums due and owing for Work done upon the Project. Contractors and Subcontractors performing Work on this project shall comply with all applicable provisions of Article 8 of the Labor Law as amended, of the State of New York.

§ 18.3 Each and every provision of law and clause required by law to be inserted into this Agreement shall be deemed to have been incorporated herein. If any such provision is not inserted through mistake or otherwise, then upon the application of either party, this Agreement shall be amended in writing, and signed by both parties to make such insertion.

[Remainder of page intentionally left blank]

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*

«Anthony J. Picente Jr.»
«County Executive»

(Printed name and title)

CONTRACTOR *(Signature)*

«TBD»
« »

(Printed name and title)

F
L
A
R
A

Protection of Rights

Assumption of Risk, Insurance Requirements, and Bonds

1. Protection of Rights

1.1. Assumption of Risk

- 1.1.1.** The Contractor solely assumes the following risks. The risk of unforeseen obstacles and difficulties in the prosecution of the Work covered by the Contract, whether such risks are within or beyond the control of the Contractor and whether such risks involve a legal duty, primary or otherwise, imposed upon the County. The risk of loss or damage, direct or indirect, to any equipment, tools, materials or property furnished, used, installed or received by the County, the Contractor or any subcontractor, performing services or furnishing materials for the Work covered hereunder.
- 1.1.2.** To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold the County harmless against any and all claims (including but not limited to claims asserted by any employee of the Contractor and/or its subcontractor) and costs and expenses of whatever kind (including but not limited to payment or reimbursement of attorneys' fees and disbursements) allegedly arising out of or in any way related to the risks it assumes under this Section, operations of the Contractor and its subcontractor(s) in the performance of the Contract or from the Contractor's and/or its subcontractor's failure to comply with any of the provisions of the Contract or of the law. Such costs and expenses shall include all those incurred in defending the underlying claim and those incurred in connection with the enforcement of this Article IV(1)(b) by way of crossclaim, third-party claim, declaratory action or otherwise.
- 1.1.3.** Neither the termination of the Contract nor the making of the final payment shall release the Contractor from its obligations under this Section, entitled Assumption of Risk. The enumeration elsewhere herein of particular risks assumed by the Contractor or of particular claims for which it is responsible shall not be deemed to limit the effect of the provision of this Section or to imply that it assumes or is responsible for only risks or claims of the type enumerated.
- 1.1.4.** This assumption of risk by the Contractor is absolute, excepting only reckless or intentional acts of the County, its officers, agents, or employees.

1.2. Insurance Requirements

1.2.1. The Contractor shall purchase and maintain insurance of the following types of coverage and limits of liability with an insurance carrier qualified and admitted to do business in the State of New York. The insurance carrier must have at least an A- (excellent) rating by A. M. Best.

1.2.1.1. Commercial General Liability (CGL) coverage with limits of not less than One Million Dollars (\$1,000,000) each occurrence, and Two Million Dollars (\$2,000,000) Annual Aggregate. CGL coverage shall be written on ISO Occurrence form CG 00 01 1001, or a substitute form providing equivalent coverage and shall cover liability arising from premises, operations, XCU, independent contracts, products, pollution, completed operations, personal and advertising injury. The County, the County's consultants and sub-consultants shall be included as an additional insured, on a primary and non-contributing basis before any other insurance or self-insurance, including any deductible or self-insured retention, maintained by, or provided to, the additional insured. The Contractor shall maintain said CGL coverage for itself and the additional insured for the duration of the Contract Period and maintain completed operations coverage for itself and the additional insured for at least three (3) years after completion.

1.2.1.2. Workers' Compensation and Employer's Liability, pursuant to statutory limits.

1.2.1.3. Business Automobile Liability with limits of at least One Million Dollars (\$1,000,000) each accident. Coverage must include liability arising out of all owned, leased, hired and non-owned automobiles. The County shall be included as an additional insured on a primary and non-contributing basis.

1.2.1.4. Commercial Umbrella coverage with limits of at least Five Million Dollars (\$5,000,000). The County shall be included as an additional insured. Umbrella coverage for such additional insured shall apply as primary and non-contributing before any other insurance or self-insurance, including any deductible or self-insured retention, maintained by or provided to the additional insured.

1.2.1.5. Owners and Contractors Protective Liability Insurance in the amount of not less than One Million Dollars (\$1,000,000) per occurrence. The Contractor agrees to have this policy in the County's name.

1.2.1.6. Waiver of Subrogation: The Contractor waives all rights against the County, and its agents, officers, and employees for recovery of damages to the extent these damages are covered by insurance maintained per requirements stated above.

1.2.1.7. The County shall not issue a notice to proceed until certificates evidencing the insurance required by this Section have been provided to the County. The certificates shall be on forms approved by the County and shall contain a provision that coverage afforded under the policies will not be cancelled or allowed to expire until at least thirty (30) days prior written notice has been given to the County. Acceptance of the certificates shall not relieve the Contractor of any of the insurance requirements, nor decrease the liability of the Contractor. The County reserves the right to require the Contractor to provide insurance policies for review by the County. The Contractor grants the County a limited power of attorney to communicate with the Contractor's insurance provider and/or agent for the express purpose of confirming the coverages required hereunder.



AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

Bid Reference Number 2306
Murnane Field Turf Conversion
898 Rose Place
Utica, New York 13502

THE OWNER:

(Name, legal status and address)

Oneida County
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Utica, New York 13501

THE ARCHITECT:

(Name, legal status and address)

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14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES



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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.6.1 The Owner is exempt from the payment of Sales and Compensation Use Taxes of the State of New York and of cities and counties within the State of New York under existing laws. Sales taxes on all materials to be incorporated into the project which are sold to the Owner pursuant to the provisions of the Contract are not to be included in bids. The exemption does not, however, apply to tools, machinery, equipment, or other property leased by or to the Contractor or a Subcontractor and the Contractor and his Subcontractor shall be responsible for and pay any and all applicable taxes, including Sales and Compensating Use Taxes, on such leased tools, machinery, equipment, or other property, and for materials not incorporated into the project.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for all permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Owner shall secure and pay for the building permit.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or

Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's

construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.13.1 Submit written report to the Owner of existing damage to roads, walks, lawns, buildings, other property to be affected by the Contract prior to starting work; failure to do so will make the Contractor responsible for all existing damage. The Contractor may request and schedule inspection with the Owner prior to submittal of report. Obtain consent of adjoining property owners regarding temporary easements or any other manner of physical encroachment. At the Owners request, the Contractor shall be required to provide photographs and/or video footage of existing conditions.

§ 3.13.2 No signs or advertising material will be permitted on the job site.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Paragraph Deleted

(Paragraphs deleted)

§ 3.19 Substitutions

§ 3.19.1 After the Contract has been executed, the Owner will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements.

§ 3.19.2 By making requests for substitutions based on Subparagraph 3.4.4, the Contractor:

§ 3.19.2.1 Represents that the Contractor has personally investigated the proposed substitute product and determined that is equal or superior in all respects to that specified.

§ 3.19.2.2 Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified.

§ 3.19.2.3 Certifies that the cost data presented is complete and includes all related costs under the Contract but excludes costs under separate contracts, and excludes redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent.

§ 3.19.2.4 Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

§ 3.19.3 The Contractor shall be responsible for all additional costs incurred by the Owner as a result of substitution of products whether such costs become apparent at the time of substitution or at a later date. Such costs shall include but not be limited to additional Architectural and/or Consultant fees

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents or bidding requirements, the Contractor shall within 14 days of Contract execution, furnish in writing to the Owner and Architect the names of persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review or (3) Contractor must provide additional information and that action shall be deferred until the Contractor provides further information. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection. Failure to object to a subcontractor or other contract for portions of the work shall not constitute a waiver of any of the requirements of the Contract Documents and all products furnished and services provided must conform to such requirements.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.2.2 The allowance for the combined overhead and profit included in the total cost to the Owner shall be based on the following schedule:

§ 7.2.2.1 For the Contractor, for Work performed by the Contractor's own forces, 15 percent of the cost.

§ 7.2.2.2 For the Contractor, for Work performed by the Contractor's Subcontractor, 5 percent of the amount due the Subcontractor.

§ 7.2.2.3 For the Subcontractor, for Work performed by the Subcontractor's own forces, 15 percent of the cost.

§ 7.2.3 In order to facilitate checking of quotations for extras or credits, all proposals (except those so minor that their propriety can be seen by inspection) shall be accompanied by a complete itemization of costs including labor, materials, and Subcontracts. In no case will a change involving over \$500.00 be approved without itemization.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.3.4 The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount,

the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require

money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within forty-five (45) days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to

by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 Paragraph Deleted

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's sole fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

(Paragraphs deleted)

§ 11.2 Paragraph Deleted

§ 11.3 Paragraph Deleted

(Paragraph deleted)

§ 11.4 Paragraph Deleted

§ 11.5 Paragraph Deleted

(Paragraphs deleted)

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public

authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation

within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Paragraph Deleted (Paragraphs deleted)

ADDENDUM - STANDARD ONEIDA COUNTY CONDITIONS

The following addendum modifies, changes, or adds to the contract for construction between the County of Oneida, hereinafter known as County, and a Contractor, subcontractor, vendor, vendee, licensor, licensee, lessor, lessee or any third party, hereinafter known as Contractor.

WHEREAS, County and Contractor intend to enter into a contract, license, lease, amendment or other agreement of any kind (hereinafter referred to as the "Contract"), and

WHEREAS, the Oneida County Attorney and the Oneida County Director of Purchasing have recommended the inclusion of the standard clauses set forth in this Addendum to be included in every Contract for which County is a party, now, thereafter,

The parties to any Contract, for good consideration, agree to be bound by the following clauses which will be made a part of the Contract.

1. EXECUTORY OR NON-APPROPRIATION CLAUSE.

a. The County shall have no liability or obligation under this Contract to the Contractor or to anyone else beyond the annual funds being appropriated and available for this Contract.

2. ONEIDA COUNTY BOARD OF LEGISLATORS: RESOLUTION #249 SOLID WASTE DISPOSAL REQUIREMENTS.

a. Pursuant to Oneida County Board of Legislator Resolution No. 249 of May 26, 1999, the Contractor agrees to deliver exclusively to the facilities of the Oneida-Herkimer Solid Waste Authority, all waste and recyclables generated within the Authority's service area by performance of this Contract by the Contractor and any subcontractors. Upon awarding of this Contract, and before work commences, the Contractor will be required to provide Oneida County with proof that Resolution No. 249 of 1999 has been complied with, and that all wastes and recyclables in the Oneida-Herkimer Solid Waste Authority's service area which are generated by the Contractor and any subcontractors in performance of this Contract will be delivered exclusively to Oneida-Herkimer Solid Waste Authority facilities.

3. CERTIFICATIONS REGARDING LOBBYING, DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS, AND DRUG-FREE WORKPLACE REQUIREMENTS.

a. Lobbying. As required by Section 1352, Title 31 of the U.S. Code and implemented at 34 CFR Part 82 for persons entering into a grant or cooperative agreement over \$100,000, as defined at 34 CFR Part 82, Section 82.105 and 82.110, the Contractor certifies that:

i. No federal appropriated funds have been paid or will be paid, by or on behalf of the Contractor, to any persons for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of

Congress in connection with the making of any federal grant, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal grant or cooperative agreement.

ii. If any funds other than federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal grant or cooperative agreement, the Contractor shall complete and submit Standard Form 111 "Disclosure Form to Report Lobbying," in accordance with its instructions.

iii. The Contractor shall require that the language of this certification be included in the award documents for all subcontracts and that all subcontractors shall certify and disclose accordingly.

b. Debarment, Suspension and other Responsibility Matters. As required by Executive Order 12549, Debarments and Suspension, and implemented at 34 CFR Part 85, for prospective participants in primary covered transactions, as defined at 34 CFR Part 85, Sections 83.105 and 85.110,

i. The Contractor certifies that it and its principals:

A. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any federal department or agency;

B. Have not within a three-year period preceding this Contract been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state or local) transaction or contract under a public transaction, violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

C. Are not presently indicted or otherwise criminally or civilly charged by a Government entity (federal, state or local) with commission of any of the offenses enumerated in subparagraph (B), above, of this certification; and

D. Have not within a three-year period preceding this Contract had one or more public transactions (federal, state, or local) for cause or default;

ii. Where the Contractor is unable to certify to any of the statements in this certification, he or she shall attach an explanation to this Contract.

c. Drug-Free Workplace (Contractors other than individuals). As required by the Drug-Free Workplace Act of 1988, and implemented at 34 CFR Part 85, Subpart F, for Contractors, as defined at 34 CFR Part 85, Sections 85.605 and 85.610:

i. The Contractor will or will continue to provide a drug-free workplace by:

A. Publishing a statement notifying employees that the manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

B. Establishing an ongoing drug-free awareness program to inform employees about:

1) The dangers of drug abuse in the workplace;

2) The Contractor's policy of maintaining a drug-free workplace;

3) Any available drug counseling, rehabilitation, and employee assistance program; and

4) The penalties that may be imposed upon an employee for drug abuse violation occurring in the workplace;

C. Making it a requirement that each employee to be engaged in the performance of the Contract be given a copy of the statement required by paragraph (A), above;

D. Notifying the employee in the statement required by paragraph (A), above, that as a condition of employment under the Contract, the employee will:

1) Abide by the terms of the statement; and

2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five (5) calendar days after such conviction;

E. Notifying the County, in writing within ten (10) calendar days after having received notice under subparagraph (D)(2), above, from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position and title, to:

1) Director, Grants Management Bureau, State Office Building Campus, Albany, New York 12240. Notice shall include the identification number(s) of each affected contract.

F. Taking one of the following actions, within thirty (30) calendar days of receiving notice under paragraph (D)(2), above, with respect to any employee who is so convicted;

1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state or local health, law enforcement, or other appropriate agency;

G. Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (A),(B),(C),(D),(E) and (F), above.

ii. The Contractor may insert in the space provided below the site(s) for the performance of work done in connection with the specific contract.

Place of Performance (street, address, city, county, state, zip code)

d. Drug-Free Workplace (Contractors who are individuals). As required by the Drug-Free Workplace act of 1988, and implemented at 34 CFR Part 85, Subpart F, for Contractors that are individuals, as defined at 34 CFR Part 85, Sections 85.605 and 85.610:’

i. As a condition of the contract, the Contractor certifies that he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the Contract; and

ii. If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any contract activity, the Contractor will report the conviction, in writing, within ten (10) calendar days of the conviction, to:

A. Director, Grants Management Bureau, State Office Building Campus, Albany, NY 12240.

Notice shall include the identification number(s) of each affected Contract.

4. HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA). When applicable to the services provided pursuant to the Contract:

a. The Contractor, as a Business Associate of the County, shall comply with the Health Insurance Portability and Accountability Act of 1996, hereinafter referred to as “HIPAA,” as well as all regulations promulgated by the Federal Government in furtherance thereof, to assure the privacy and security of all protected health information exchanged between the Contractor and the County. In order to assure such privacy and security, the Contractor agrees to enact the following safeguards for protected health information:

i. Establish policies and procedures, in written or electronic form, that are reasonably designed, taking into consideration the size of, and the type of activities undertaken by, the Contractor,

to comply with the Standards for Privacy of Individual Identifiable Health Information, commonly referred to as the Privacy Rule;

ii. Utilize a combination of electronic hardware and computer software in order to securely store, maintain, transmit, and access, protected health information electronically; and

iii. Utilize an adequate amount of physical hardware, including but not limited to, locking filing cabinets, locks on drawers, other cabinets and office doors, in order to prevent unwarranted and illegal access to computers and paper files that contain protected health information of the County's clients.

b. This agreement does not authorize the Contractor to use or further disclose the protected health information that the Contractor handles in treating patients of the County in any manner that would violate the requirements of 45 CFR § 164.504(e), if that same use or disclosure were done by the County, except that:

i. The Contractor may use and disclose protected health information for the Contractor's own proper management and administration; and

ii. The Contractor may provide data aggregation services relating to the health care operations of the County.

c. The Contractor shall:

i. Not use or further disclose protected health information other than as permitted or required by this contract or as required by law;

ii. Use appropriate safeguards to prevent the use or disclosure of protected health information other than as provided for in this Contract;

iii. Report to the County any use or disclosure of the information not provided for by this Contract of which the Contractor becomes aware;

iv. Ensure that any agents, including a subcontractor, to whom the Contractor provides protected health information received from, or created or received by the Contractor on behalf of the County, agrees to the same restrictions and conditions that apply to the Contractor with respect to such protected health information;

v. Make available protected health information in accordance with 45 CFR §164.524;

vi. Make available protected health information for amendment and incorporate any amendments to protected health information in accordance with 45 CFR §164.528;

vii. Make available the information required to provide an accounting of disclosures in accordance with 45 CFR § 164.528;

viii. Make its internal practices, books, and records relating to the use and disclosure of protected health information received from, or created or received by, the Contractor on behalf of the County available to the Secretary of Health and Human Services for purposes of determining the County's compliance with 45 CFR § 164.504(e)(2)(ii); and

ix. At the termination of this Contract, if feasible, return or destroy all protected health information received from, or created or received by, the Contractor on behalf of the County that the Contractor still maintains, in any form, and retain no copies of such information; or, if such return or destruction is not feasible, extend the protections of this Contract permanently to such information and limit further uses and disclosures to those purposes that make the return or destruction of the information infeasible.

d. The Contractor agrees that this contract may be amended if any of the following events occurs:

i. HIPAA, or any of the regulations promulgated in furtherance thereof, is modified by Congress or the Department of Health and Human Services;

ii. HIPAA, or any of the regulations promulgated in furtherance thereof, is interpreted by a court in a manner impacting the County's HIPAA compliance; or

iii. There is a material change in the business practices and procedures of the County.

e. Pursuant to 45 CFR § 164.504(e)(2)(iii), the County is authorized to unilaterally terminate this Contract if the County determines that the Contractor has violated a material term of this Contract.

5. NON-ASSIGNMENT CLAUSE. In accordance with Section 109 of the General Municipal Law, this Contract may not be assigned by the Contractor or its right, title or interest therein assigned, transferred, conveyed, sublet or otherwise disposed of without the County's previous written consent, and any attempts to do so are null and void. The Contractor may, however, assign its right to receive payments without the County's prior written consent unless this Contract concerns Certificates of Participation pursuant to Section 109-b of the General Municipal Law.

6. WORKER'S COMPENSATION BENEFITS In accordance with Section 108 of the General Municipal Law, this Contract shall be void and of no force and effect unless the Contractor shall provide and maintain coverage during the life of this Contract for the benefit of such employees as are required to be covered by the provisions of the Workers' Compensation Law.

7. NON-DISCRIMINATION REQUIREMENTS. To the extent required by Article 15 of the Executive Law (also known as the Human Rights Law) and all other state and federal statutory and constitutional non-discrimination provisions, the Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, national origin, sexual orientation, age, disability, genetic predisposition or carrier status, or marital status. Furthermore, in accordance with Section 220-e of the Labor Law, if this is a Contract for the construction, alteration or repair of any public building or public work or for the manufacture, sale or distribution of materials, equipment or supplies, and to the extent that this Contract shall be performed within the State of New York, the Contractor agrees that neither it nor its subcontractors shall, by reason of race, creed, color, disability, sex, or national origin: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this Contract. If this is a building service contract as defined in Section 230 of the Labor Law, then, in accordance with Section 239 of the Labor Law, the Contractor agrees that neither it nor its subcontractors shall by reason of race, creed, color, national origin, age, sex or disability: (a) discriminate in hiring against any New York State citizen who is qualified and available to perform the work; or (b) discriminate against or intimidate any employee hired for the performance of work under this Contract. The Contractor is subject to fines of \$50.00 per person per day for any violation of Section 220-e or Section 239 as well as possible termination of this Contract and forfeiture of all monies due hereunder for a second or subsequent violation.

8. WAGE AND HOURS PROVISIONS. If this is a public work contract covered by Article 8 of the Labor Law or a building service contract covered by Article 9 of the Labor Law, neither the Contractor's employees nor the employees of its subcontractors may be required or permitted to work more than the number of hours or days stated in said Articles, except as otherwise provided in the Labor Law and as set forth in prevailing wage and supplement schedules issued by the State Labor Department. Furthermore, the Contractor and its subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the State Labor Department in accordance with the Labor Law. Additionally, effective April 28, 2008, if this is a public work contract covered by Article 8 of the Labor Law, the Contractor understands and agrees that the filing of payrolls in a manner consistent with Subdivision 3-a of Section 220 of the Labor Law shall be a condition precedent to payment by the County of any County-approved sums due and owing for work done upon the project.

9. NON-COLLUSIVE BIDDING CERTIFICATION. In accordance with Section 103-d of the General Municipal Law, if this Contract is awarded based upon the submission of bids, the Contractor certifies and affirms, under penalty of perjury, as to its own organization, under penalty of perjury, that to the best of its knowledge and belief: (1) the prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor; and (2) unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and (3) no attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition. The Contractor further affirms that, at the time the Contractor submitted its bid, an authorized and responsible person executed and delivered to the County a non-collusive bidding certification on the Contractor's behalf.

10. RECORDS. The Contractor shall establish and maintain complete and accurate books, records, documents, accounts and other evidence directly pertaining to performance under this Contract (hereinafter, collectively, "the Records"). The Records shall include, but not be limited to, reports, statements, examinations, letters, memoranda, opinions, folders, files, books, manuals, pamphlets, forms, papers, designs, drawings, maps, photos, letters, microfilms, computer tapes or discs, electronic files, e-mails (and all attachments thereto), rules, regulations and codes. The Records must be kept for the balance of the calendar year in which they were made and for six (6) additional years thereafter. The County Comptroller, the County Attorney and any other person or entity authorized to conduct an audit or examination, as well as the agency or agencies involved in this Contract, shall have access to the Records during normal business hours at an office of the Contractor within the County or, if no such office is available, at a mutually agreeable and reasonable venue within the County, for the term specified above, for the purposes of inspection, auditing and copying. The County shall take reasonable steps to protect from public disclosure any of the Records which are exempt from disclosure under Section 87 of the Public Officers Law (the "Statute"), provided that: (a) the Contractor shall timely inform an appropriate County official, in writing, that said records should not be disclosed; (b) said records shall be sufficiently identified; and (c) in the sole discretion of the County, designation of said records as exempt under the Statute is reasonable. Nothing contained herein shall diminish, or in any way adversely affect, the County's right to discovery in any pending or future litigation. Notwithstanding any other language, the Records may be

subject to disclosure under the New York Freedom of Information Law, for other applicable state or federal law, rule or regulation.

11. IDENTIFYING INFORMATION AND PRIVACY NOTIFICATION.

a. Identification Number(s). Every invoice or claim for payment submitted to a County agency by a payee, for payment for the sale of goods or service or for transactions (e.g., leases, easements, licenses, etc.) related to real or personal property must include the payee's identification number. This number includes any or all of the following: (i) the payee's Federal employer identification number, (ii) the payee's Federal social security number, and/or (iii) the payee's Vendor Identification Number assigned by the Statewide Financial System. Where the payee does not have such number or numbers, the payee, on its invoice or claim for payment, must state with specificity the reason or reasons why the payee does not have such number or numbers.

b. Privacy Notification. (i) The authority to request the above personal information from a seller of goods or services or a lessor of real or personal property, and the authority to maintain such information, is found in Section 5 of the State Tax Law. Disclosure of this information by the seller or lessor to the County is mandatory. The principle purpose for which the information is collected is to enable the State to identify individuals, businesses and others who have been delinquent in filing tax returns or may have understated their liabilities and to generally identify persons affected by the taxes administered by the New York State Commissioner of Taxation and Finance. The information will be used for tax administration purposes and for any other purpose authorized by law. (ii) The personal information is requested by the County's purchasing unit contracting to purchase goods or services or lease the real or personal property covered by this Contract.

12. CONFLICTING TERMS. In the event of a conflict between the terms of the Contract (including any and all attachments thereto and amendments thereof) and the terms of this Addendum, the terms of this Addendum shall control.

13. GOVERNING LAW. This Contract shall be governed by the laws of the State of New York except where the Federal Supremacy Clause requires otherwise.

14. PROHIBITION ON PURCHASE OF TROPICAL HARDWOODS.

a. The Contractor certifies and warrants that all wood products to be used under this Contract award will be acquired in accordance with, but not limited to, the specifications and provisions of Section 165 of the State Finance Law (Use of Tropical Hardwoods), which prohibits purchase and use of tropical hardwoods, unless specifically exempted by the State or any governmental agency or political

subdivision or public benefit corporation. Qualification for an exemption under this law will be the sole responsibility of the Contractor to establish to meet with the approval of the County.

b. In addition, when any portion of this Contract involving the use of woods, whether for supply or installation, is to be performed by any subcontractor, the prime Contractor will indicate and certify in the submitted bid proposal that the subcontractor has been informed and is in compliance with specifications and provisions regarding use of tropical hardwoods as detailed in Section 165 of the State Finance Law. Any such use must meet with approval of the County; otherwise, the bid may not be considered responsive. Under bidder certifications, proof of qualification for exemption will be the sole responsibility of the Contractor to establish to meet with the approval of the County.

15. COMPLIANCE WITH NEW YORK STATE INFORMATION SECURITY BREACH AND NOTIFICATION ACT. The Contractor shall comply with the provisions of the New York State Information Security Breach and Notification Act (General Business Law Section 899-aa).

16. GRATUITIES AND KICKBACKS.

a. Gratuities. It shall be unethical for any person to offer, give, or agree to give any County employee or former County employee, or for any County employee or former County employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, or preparation of any part of a program requirement or a purchase request; influencing the content of any specification or procurement standard; rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application; request for ruling, determination, claim, or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract, or to any solicitation or proposal therefor.

b. Kickbacks. It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime Contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

17. AUDIT.

a. The County, the State of New York, and the United States shall have the right at any time during the term of this agreement and for the period limited by the applicable statute of limitations to audit the payment of monies hereunder. The Contractor shall comply with any demands made by the County to provide information with respect to the payment of monies made hereunder during the period covered by this paragraph. The Contractor shall maintain its books and records in accordance with

generally accepted accounting principles or such other method of account which is approved in writing by the County prior to the date of this agreement. The revenues and expenditures of the Contractor in connection with this agreement shall be separately identifiable. Each expenditure or claim for payment shall be fully documented. Expenditures or claims for payment which are not fully documented may be disallowed. The Contractor agrees to provide to, or permit the County to examine or obtain copies of, any documents relating to the payment of money to the Contractor or expenditures made by the Contractor for which reimbursement is requested to be made or has been made to the Contractor by the County. The Contractor shall maintain all records required by this paragraph for 7 years after the date this agreement is terminated or ends.

b. If the Contractor has expended, in any fiscal year, \$300,000.00 or more in funds provided by a federal financial assistance program from a federal agency pursuant to this agreement and all other contracts with the County, the Contractor shall provide the County with an audit prepared by an independent auditor in accordance with the Single Audit Act of 1984, 31 U.S.C. §§ 7501, et seq., as amended, and the regulations adopted pursuant to such Act.

18. CERTIFICATION OF COMPLIANCE WITH THE IRAN DIVESTMENT ACT.

a. Pursuant to Section 103-g of the General Municipal Law, by submitting a bid in response to this solicitation or by assuming the responsibility of a Contract awarded hereunder, each bidder or Contractor, or any person signing on behalf of any bidder or Contractor, and any assignee or subcontractor and, in the case of a joint bid, each party thereto, certifies, under penalty of perjury, that once the Prohibited Entities List is posted on the Office of General Services (hereinafter "OGS") website, that to the best of its knowledge and belief, that each bidder or Contractor and any subcontractor or assignee is not identified on the Prohibited Entities List created pursuant to State Finance Law § 165-a(3)(b).

b. Additionally, the bidder or Contractor is advised that once the Prohibited Entities List is posted on the OGS website, any bidder or Contractor seeking to renew or extend a Contract or assume the responsibility of a Contract awarded in response to this solicitation must certify at the time the Contract is renewed, extended or assigned that it is not included on the Prohibited Entities List.

c. During the term of the Contract, should the County receive information that a bidder or Contractor is in violation of the above-referenced certification, the County will offer the person or entity an opportunity to respond. If the person or entity fails to demonstrate that he, she or it has ceased engagement in the investment which is in violation of the Iran Divestment Act of 2012 within ninety

(90) days after the determination of such violation, then the County shall take such action as may be appropriate, including, but not limited to, imposing sanctions, seeking compliance, recovering damages or declaring the bidder or Contractor in default,

d. The County reserves the right to reject any bid or request for assignment for a bidder or Contractor that appears on the Prohibited Entities List prior to the award of a Contract and to pursue a responsibility review with respect to any bidder or Contractor that is awarded a Contract and subsequently appears on the Prohibited Entities List.

19. PROHIBITION ON TOBACCO AND E-CIGARETTE USE ON COUNTY PROPERTY

a. Pursuant to Local Law No. 3 of 2016, the use of tobacco and e-cigarettes are prohibited on Oneida County property, as follows:

i. For the purposes of this provision, the “use of tobacco” shall include:

A. The burning of a lighted cigarette, pipe, cigar or other lighted instrument for the purpose of smoking tobacco or a tobacco substitute;

B. The use of tobacco and/or a substance containing tobacco or a tobacco substitute by means other than smoking, including: chewing; holding in the mouth; or expectoration of chewing tobacco.

ii. For the purposes of this provision, “e-cigarette” shall mean an electronic device composed of a mouthpiece, heating element, battery and electronic circuit that delivers vapor which is inhaled by an individual user as he or she simulates smoking.

iii. For the purposes of this provision, “on Oneida County property” shall be defined as:

A. Upon all real property owned or leased by the County of Oneida; and

B. Within all County of Oneida-owned vehicles or within private vehicles when being used for a County of Oneida purpose, except that a driver may smoke in a privately-owned vehicle being used for a County of Oneida Purpose if the driver is the sole occupant of the vehicle.

iv. Each violation of this Local Law No. 3 of 2016 shall constitute a separate and distinct offense and may be punishable by a fine of up to \$200.00 for a first offense and up to \$1,000.00 for subsequent offenses.

20. COMPLIANCE WITH NEW YORK STATE LABOR LAW § 201-G

a. The Contractor shall comply with the provisions of New York State Labor Law § 201-g.

(EXAMPLE FORMAT - Submit on contractor's letterhead.)

COMPLIANCE WITH LABOR RATES

State of New York)
County of Oneida)

(NAME) , being duly sworn, deposed and says that I am the (TITLE) of (COMPANY NAME), and I make this affidavit in order to induce Oneida County to make final payment to (COMPANY NAME) under the contract between (COMPANY NAME) and Oneida County for (DESCRIPTION OF WORK) work performed for County Contract No. (HXXXXXXXX), (PROJECT NAME), County of Oneida, State of New York.

That all men employed by (COMPANY NAME), have been fully paid, and that all labor, tax assessments and levies applicable to the labor performed by (COMPANY NAME), have been fully paid, and there are no outstanding bills or claims of any nature whatsoever against (COMPANY NAME), arising out of labor performed under the aforesaid contract with Oneida County.

That the same Company has complied with or exceeded the minimum hourly rates as determined by the Department of Labor for persons employed on the aforesaid contract with Oneida County.

That the final payment in the sum of \$(FINAL PAYMENT AMOUNT) from Oneida County hereby releases and forever discharges Oneida County from any claim of any nature whatsoever arising out of the aforesaid contract.

(S)

(Name)

(Title)

Sworn to before me this _____ day of _____, 20_____.

Notary Public

(EXAMPLE FORMAT - Submit on contractor's letterhead.)

GUARANTEE

(Date)

Oneida County Department of Public Works
Division of Engineering
5999 Judd Road
Oriskany, New York 13424

Re: County Contract No. (HXXXXXXXX)
(DESCRIPTION OF CONTRACT)

Gentlemen:

In accordance with your request, we quote our guarantee:

(COMPANY NAME) GUARANTEES that the material and workmanship of the apparatus, and all the items installed by them in the above project, are first class in every respect and in accordance with the drawings and specifications and (COMPANY NAME) WILL make good any defects not due to ordinary wear and tear and improper use which may develop within one (1) year from (DATE AGREED UPON BY COUNTY AND COMPANY).

(S)

(Name)

(Title)

**NEW YORK STATE DEPARTMENT OF LABOR
PREVAILING WAGE STATEMENT**

The Contractor shall ensure that workers are paid the appropriate wages and supplemental (fringe) benefits. Throughout the contract, the Contractor shall obtain and pay workers in accordance with periodic wage rate schedule updates from the NYS Department of Labor (NYSDOL). Any wage rate amendments and supplements are available on the NYSDOL web site at:

<https://dol.ny.gov/public-work-and-prevailing-wage>

All changes or clarification of labor classification(s) and applicability of prevailing wage rates shall be obtained in writing from the Office of the Director, NYSDOL Bureau of Public Work.

The NYSDOL prevailing wage rate schedule for this contract has been determined and has been issued the Prevailing Rate Case No. (PRC#) of 2024013601. The wage rates for this contract are available on the NYSDOL web site at:

<https://apps.labor.ny.gov/wpp/showFindProject.do?method=showIt>



Submittal/ Shop Drawing Transmittal Form

DATE RETURNED: _____	DATE SENT: _____ PAGE _____ OF _____
ENGINEERING COMPANY: CHA CONSULTING, INC.	CONTRACTING COMPANY: _____
ADDRESS: 100 CHESTNUT STREET; SUITE 1300 ROCHESTER, NEW YORK 14604	ADDRESS: _____
ATTENTION: CHRISTOPHER RICHARDSON	ATTENTION: _____
PHONE: (585) 270-0043	PHONE: _____

CHA PROJECT No.: 090047	<i>FOR CHA'S RECEIVED STAMP</i>
TITLE: MURNANE FIELD TURF CONVERSION	

SUBMITTAL/ SHOP DRAWING DATA: <i>(TO BE FILLED IN BY CONTRACTOR (OR DESIGNEE))</i>	<i>FOR CHA'S RECEIVED STAMP</i>
TOPIC: _____	
SPECIFICATION: _____	
DO NOT MIX SUBMISSIONS FROM DIFFERENT SPECIFICATION DIVISIONS ON THIS FORM. FILL OUT A NEW FORM EACH TIME!	

THE ABOVE-NAMED CONTRACTOR (OR DESIGNEE) HAS EVALUATED EACH ITEM IDENTIFIED IN THIS TRANSMITTAL AND CERTIFIES IT/ THEM TO BE IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.

****THIS SUBMITTAL IS NOT BEING PRESENTED AS A SUBSTITUTION****

CERTIFIED BY: _____ **TITLE:** _____ **DATE:** _____

ID NUMBER	QUANTITY		DESCRIPTION OF ITEM(S) BEING SUBMITTED <small>(REFERENCE SPECIFICATION SECTION AND/ OR DRAWING NUMBER FOR EACH ITEM BEING SUBMITTED)</small>	ENGINEER'S REVIEW STATUS
	SENT	RETURN		

- | | |
|--|--|
| <input type="checkbox"/> NET = NO EXCEPTIONS TAKEN | <input type="checkbox"/> MCN = MAKE CORRECTIONS NOTED |
| <input type="checkbox"/> REJ* = REJECTED | <input type="checkbox"/> SSI* = SUBMIT SPECIFIED ITEM |
| <input type="checkbox"/> R&R* = REVISE AND RESUBMIT | <input type="checkbox"/> NR = NOT REVIEWED |
- *RESUBMISSION REQUIRED IF REVIEW STATUS IS R&R, REJ, OR SSI**

THIS SUBMITTAL/ SHOP DRAWING HAS BEEN REVIEWED FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS. ANY ACTION SHOWN IS SUBJECT TO THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. CONTRACTOR (OR DESIGNEE) IS RESPONSIBLE FOR THE FOLLOWING: DIMENSIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF WORK WITH THAT OF ALL OTHER TRADES, AND THE SATISFACTORY PERFORMANCE OF THE WORK. CONTRACTOR (OR DESIGNEE) IS NOT RELIEVED OF RESPONSIBILITY FOR CONFORMANCE WITH DESIGN DRAWINGS, SPECIFICATIONS, AND APPLICABLE CODES, ALL OF WHICH HAVE PRIORITY OVER THIS SUBMITTAL/ SHOP DRAWING. "NO EXCEPTION TAKEN" OR "MAKE CORRECTIONS NOTED" SHALL NOT RELIEVE THE CONTRACTOR (OR DESIGNEE) FROM RESPONSIBILITY FOR OMISSIONS, OR ERRORS IN DIMENSIONS, SHOP FITS, FIELD CONNECTIONS, ETC.; OR FOR PROVIDING THE PROPER QUANTITY OF MATERIALS; OR FOR COMPLIANCE WITH THE CONTRACT; OR FOR THE SUCCESSFUL COMPLETION OF THE PROJECT.

CONTRACTOR'S COMMENTS:	ENGINEER'S COMMENTS:

FOR ENGINEER'S INTERNAL USE ONLY:	FORWARDED TO: _____	DUE BACK TO CONTRACTOR (DATE): _____	
	REVIEWED BY: _____	DATE SENT: _____	
	RETURNED TO: _____	DATE RETURNED: _____	

ONEIDA COUNTY DEPARTMENT OF PUBLIC WORKS

Murnane Field Turf Conversion

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ONEIDA COUNTY DEPARTMENT OF PUBLIC WORKS
Murnane Field Turf Conversion

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GENERAL

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CIVIL

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ARCHITECTURAL

A-101 Dugouts – Plans, Interior & Exterior Elevations – Add Alternate GC-8
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ELECTRICAL

E-001 General Notes, Symbol Lists & Abbreviations
E-100 Electrical Site Plan
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E-501 Electrical Schedules
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END OF SECTION

SECTION 011000 – SUMMARY

PART 1 – GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Project consists of The conversion of natural grass to synthetic turf for the Murnane Field playing surface along with new fences and netting to accommodate field dimension modifications. The existing sports lighting poles will be relamped with new LED sports light fixtures.
 - 1. Project Location: Donovan Stadium at Murnane Field; 898 Rose Place, Utica NY 13502.
 - 2. Owner: Oneida County Department of Public Works - Division of Engineering; 5999 Judd Road, Oriskany, NY 13424
- B. Engineer Identification: The Contract Documents, dated November 8, 2024, were prepared for Project by CHA Consulting, Inc..
- C. The Work consists of the synthetic turf conversion and LED sport light relamping for Murnane Field.
 - 1. The Work includes the removal of the existing sod, irrigation lines, perimeter fence, and backstop netting to allow for the installation of new synthetic turf and perimeter fencing / netting. New dual bullpens will be added down both baselines and a new dual batting cage will be added behind the right field fencing. The existing sports light fixtures and new LED fixtures will be installed in kind on the existing poles.

1.2 CONTRACTS

- A. Project will be constructed under General Construction contract number H2459301 and Electrical Construction contract number H2459302.
- B. Multiple contracts are separate contracts, representing significant construction activities, between Owner and separate contractors. See Specification Section 011200 "Multiple Contract Summary" for a description of work included under each separate contract. Each contract is performed concurrently and coordinated closely with construction activities performed on Project under other contracts. Contracts for this Project include the following:
 - 1. Electrical Construction contract number H2459302.

1.3 WORK SEQUENCE

- A. The Work shall be conducted in one (1) phase.
 - 1. Synthetic Turf conversion and LED Sports Lighting Replacement. Work of this phase shall be substantially complete and ready for occupancy no later than May 23, 2025.

1.4 USE OF PREMISES

- A. General: The general and electrical contractor shall have full use of premises for construction operations, including use of Project site, during construction period. The general and electrical contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

1.5 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 48-division format and CSI/CSC's "MasterFormat" numbering system.

1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.6 MISCELLANEOUS PROVISIONS

- A. None

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 SCHEDULE OF PRODUCTS ORDERED IN ADVANCE

- A. None

END OF SECTION

SECTION 011200 –MULTIPLE CONTRACT SUMMARY

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.
- B. Specific requirements of each contract are also indicated in individual Specification Sections and on Drawings.

1.2 DEFINITIONS

- A. **Permanent Enclosure:** As determined by Engineer, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.3 CONTRACTS, GENERAL

- A. **Extent of Contract:** Unless the Contract Documents contain a more specific description of the Work, names and terminology on Drawings and in Specification Sections determine which contract includes a specific element of Project.
 - 1. Unless otherwise indicated, the Work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
 - 2. Local custom and trade-union jurisdictional settlements do not control the scope of the Work of each contract. When a potential jurisdictional dispute or similar interruption of work is first identified or threatened, affected contractors shall negotiate a reasonable settlement to avoid or minimize interruption and delays.
 - 3. Trenches for the Work of each contract shall be provided by the General Construction Contract and the Electrical Construction Contract; each contract for its own Work.
 - 4. Cutting and patching for the Work of each contract shall be provided by the General Construction Contract and the Electrical Construction Contract; each contract for its own Work.
 - 5. Firestopping for the Work of each contract shall be provided by the General Construction Contract and the Electrical Construction Contract; each contract for its own Work.
 - 6. Within 5 working days after preliminary horizontal bar-chart-type construction schedule submittal has been received from Project Coordinator, submit a matching preliminary horizontal bar-chart schedule showing construction operations sequenced and coordinated with overall construction.
- B. **Substitutions:** Each contractor shall cooperate with other contractors involved to coordinate approved substitutions with remainder of the Work.
- C. **Temporary Facilities and Controls:** In addition to specific responsibilities for temporary facilities and controls indicated in this Section and in Section "015000 Temporary Facilities and Controls," each contractor is responsible for the following:
 - 1. Installation, operation, maintenance, and removal of each temporary facility usually considered as its own normal construction activity, and costs and use charges associated with each facility.

2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
 3. Its own storage and fabrication sheds.
 4. Temporary enclosures for its own construction activities.
 5. Special or unusual hoisting requirements for its own construction activities, including hoisting loads in excess of 2 tons (2000 kg), hoisting material or equipment into spaces below grade, and hoisting requirements outside building enclosure.
 6. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary, or other harmful waste materials.
 7. Progress cleaning of its own areas on a daily basis.
 8. Secure lockup of its own tools, materials, and equipment.
 9. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
- D. Use Charges: Comply with the following:
1. Sewer Service: Include the cost for sewer service use by all parties engaged in construction activities at Project site in the General Construction Contract.
 2. Water Service: Include the cost for water service, whether metered or otherwise, for water used by all entities engaged in construction activities at Project site in the General Construction Contract. The use of owner water is allowed with proper winterization protection.
 3. Electric Power Service: Include the cost for electric power service, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site in the Electrical Construction Contract.

1.4 GENERAL CONSTRUCTION CONTRACT

- A. Work in the General Construction Contract includes, but is not limited to, the following:
1. Site preparation, including clearing, demolition and relocations, and earthwork.
 2. Site improvements, including roadways, parking lots, pedestrian paving, site development furnishings and equipment, and landscaping.
 3. Tunnels for site utilities.
 4. Selective demolition.
 5. Foundations, including footings, foundation walls.
 6. Slabs-on-grade, including earthwork, subdrainage systems, and insulation.
 7. Below-grade building construction, including excavation, backfill, and thermal and moisture protection.
 8. Interior finishes.
 9. Equipment, including fencing, netting systems, baseball equipment, padding systems, and seating systems.
- B. Temporary facilities and controls in the General Construction Contract include, but are not limited to, the following:
1. Temporary facilities and controls that are not otherwise specifically assigned to the Electrical Contract.
 2. Unpiped sewers and drainage, including drainage ditches, dry wells, stabilization ponds, and containers.
 3. Stormwater control.
 4. Unpiped temporary toilet fixtures, wash facilities, and drinking water facilities, including disposable supplies.
 5. Temporary roads and paved areas.

6. Dewatering facilities and drains.
7. General hoisting facilities for materials and personnel, up to 2 tons (2000 kg).
8. Project identification and temporary signs.
9. General waste disposal facilities.
10. Pest control.
11. Temporary fire-protection equipment.
12. Barricades, warning signs, and lights.
13. Site enclosure fence.
14. Security enclosure and lockup.
15. Environmental protection.
16. Restoration of Owner's existing facilities used as temporary facilities.

1.5 ELECTRICAL CONTRACT

- A. Work in the Electrical Contract includes, but is not limited to, the following:
 1. Site electrical distribution.
 2. Sports lighting.
 3. Electrical service and distribution.
 4. Lighting and branch wiring.
 5. Electrical connections to equipment furnished by the General Construction Contract.
- B. Temporary facilities and controls in the Electrical Contract include, but are not limited to, the following:
 1. Electric power service and distribution.
 2. Lighting, including site lighting.
 3. Electrical connections to existing systems and temporary facilities and controls furnished by the General Construction Contract.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 011400 – WORK RESTRICTIONS

PART 1 – GENERAL

1.1 USE OF PREMISES

- A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
 - 1. Limits: Confine constructions operations to areas within the contract limits indicated.
 - 2. Owner Occupancy: Allow for Owner occupancy of site and use of the adjacent parking lot by the public.
 - 3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
- B. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.
- C. All work areas will require a perimeter chain-link locked security fence to protect the work site from access by unauthorized personnel.

1.2 OCCUPANCY REQUIREMENTS

- A. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of the stadium, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
 - 1. A Certificate of Substantial Completion will be prepared for each specific portion of the Work to be occupied before Owner occupancy.
 - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
 - 3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will provide, operate, and maintain mechanical and electrical systems serving occupied portions of building.
 - 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

WORK RESTRICTIONS

PAGE 1 OF 1
CHA PROJECT NO. 090047
SECTION 011400

SECTION 012100 – ALLOWANCES

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
 - 1. Certain materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Contingency allowances.
 - 4. Quantity allowances.

1.2 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Engineer of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Engineer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Engineer from the designated supplier.

1.3 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.4 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by for the Owner's Representative for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included as a part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Include a lump sum of \$50,000 for the General Construction contract for use at the Owner's discretion by change order authorization.
- B. Allowance No. 2: Include a lump sum of \$10,000 for the Electrical Construction contract for use at the Owner's discretion by change order authorization.

END OF SECTION

SECTION 012300 – ALTERNATES

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. **Alternate:** An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. **Coordination:** Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. **Notification:** Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. **Execute accepted alternates under the same conditions as other work of the Contract.**
- D. **Schedule:** A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 SCHEDULE OF ALTERNATES – General Construction Contract

- A. **Alternate No. GC-1:** Provide demolition of the existing batting tunnel structure; including but not limited to posts, footings, sod, netting, and connections on the third base side. In it's place a new dual batting tunnel with synthetic turf, netting, perimeter fencing, and a soft toss area will be provided per detail 1/C-604 and specification section 116820 Outdoor Sports Equipment; in lieu of the existing structure to remain per base bid documents.
- B. **Alternate No. GC-2:** Provide two portable player benches and two two-tiered team benches for both bullpens per 3/C-604 and specification section 116820 Outdoor Sports Equipment.

- C. Alternate No. GC-3: Provide decomposed granite surfacing for a spectator standing area from the end of the 1st base bullpen to the right field batting tunnel. Location per sheet C-100, details per 12/C-600 and specification section 321500 Decomposed Granit Surfacing.
- D. Alternate No. GC-4: Demolish the existing flagpole and concrete base / footing. Provide a new flagpole and footing in the same location per details 3&4/C-606.
- E. Alternate No. GC-5: Provide chain link fence top rail padding in lieu of the top rail guard in all locations per details on sheets C-605 & C-606 specification section 116820 Outdoor Sports Equipment.
- F. Alternate No. GC-6: Provide concrete pad and two row tiered seating between the dugout and bullpen on the base lines. The locations on the pad and detail of the 27 seats per sheet A-102.
- G. Alternate No. GC-7: Provide additional protective 40' H (above dugouts) and 10' H (past the dugouts) tension netting, gates, posts and connections per details on sheets C-602. & C-603 and specification section 116820 Outdoor Sports Equipment.
- H. Alternate No. GC-8: Provide new paint, player benches, cubbies, and shelves for both dugouts per sheet A-101.

3.2 SCHEDULE OF ALTERNATES – Electrical Construction Contract

- A. Alternate No. EC-1: Provide the power for weatherproof GFI's for the GC-1 3rd base side batting tunnels. This is to be fed from panel LP2 with routing per E-100.

END OF SECTION

SECTION 013000 – PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination.
 - 2. Submittals.
 - 3. Administrative and supervisory personnel.
 - 4. Project meetings.
 - 5. General installation provisions.
 - 6. Cleaning and protection.
- B. Where applicable, each prime Contractor shall participate in these coordination requirements, even though certain areas of responsibility are assigned to a specific prime Contractor.

1.2 COORDINATION

- A. Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of these Specifications that are dependent upon each other for proper installation, connection, and operation.
- B. Coordination: Each prime contractor shall cooperate with Owner's, coordinate construction activities to assure efficient and orderly installation of each part of the Work.
 - 1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, cooperate with scheduled construction activities in the sequence required to obtain the best results.
 - 2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
 - 4. Coordinate construction activities with public and private utilities.
 - a. Notify UDIG_NY a minimum of 48 hours prior to excavation or blasting.
 - b. Notify the Owner and Engineer of any utility locations encountered which conflict with the work. Coordinate with the Owner and Utility Company in the protection, removal, relocation or replacement of conflicting utility locations.
- C. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
 - 1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.

2. Preparation of the Schedule of Values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Pre-installation conferences.
 7. Project closeout activities.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.3 SUBMITTALS

- A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
1. Show the interrelationship of components shown on separate Shop Drawings.
 2. Indicate required installation sequences.
 3. Comply with requirements contained in Section "Submittals Procedures."
 4. Refer to Section "Basic Mechanical Materials and Methods," Section "Coordinated Shop Drawings," and Section "Basic Electrical Requirements" for specific coordination Drawing requirements for mechanical and electrical installations.
- B. Staff Names: Within 15 days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone.

1.4 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within 3 days of the meeting.
- B. Preconstruction Conference: Schedule a preconstruction conference and organizational meeting at the Project site or other convenient site prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, the Engineer, Engineer and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers and other concerned parties shall each be represented at the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing.
 - d. Designation of responsible personnel.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for processing Applications for Payment.
 - g. Distribution of the Contract Documents.
 - h. Submittal procedures.
 - i. Preparation of Record Documents.
 - j. Use of the premises.
 - k. Responsibility for temporary facilities and controls.
 - l. Parking availability.
 - m. Office, work, and storage areas.
 - n. Equipment deliveries and priorities.
 - o. Safety procedures.
 - p. First aid.
 - q. Security.
 - r. Progress cleaning.
 - s. Working hours.
 - t. Housekeeping.
 - u. Subcontractors.
 - v. Preliminary Schedule of Shop Drawings and Samples.
 - w. Minority Business Enterprise Goals.
 - x. Co-ordination with other contractors.
 - y. Insurance in Force.
 - z. Contractor's Schedule of Values.

- C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Engineer of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related Change Orders.
 - d. Purchases.
 - e. Deliveries.
 - f. Shop Drawings, Product Data and quality control Samples.
 - g. Review of mockups.
 - h. Possible conflicts.
 - i. Compatibility problems.
 - j. Time schedules.

- k. Weather limitations.
 - l. Manufacturer's written recommendations.
 - m. Warranty requirements.
 - n. Compatibility of materials.
 - o. Acceptability of substrates.
 - p. Temporary facilities and controls.
 - q. Space and access limitations.
 - r. Governing regulations.
 - s. Testing and inspecting requirements.
 - t. Required performance results.
 - u. Protection of construction and personnel.
 - v. Safety.
 - w. Recording requirements.
3. Record significant discussions, agreements and disagreements of each conference along with the approved progress schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Engineer.
 4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at the Project Site at regularly scheduled intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of the Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Time.
 - 3) Sequence of operations.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.

- 13) Quality and work standards.
 - 14) Change Orders.
 - 15) Documentation of information for payment requests.
3. Reporting: No later than 3 days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.
- E. Coordination Meetings: Conduct Project coordination meetings at regularly scheduled intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.
1. Attendees: In addition to representatives of the Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Time.
 - 3) Sequence of operations.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Change Orders.
 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Engineer for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Engineer for final decision.

3.2 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 - 1. Excessive static or dynamic loading.
 - 2. Excessive internal or external pressures.

3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
9. Chemicals.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
19. Electrical current.
20. High speed operation.
21. Improper lubrication.
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

END OF SECTION

SECTION 013200 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Preliminary Construction Schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Submittals Schedule.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Field condition reports.
 - 7. Special reports.
 - 8. Construction photographs.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor activity is an activity that must be completed before a given activity can be started.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule miles and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- G. Major Area: A story of construction, a separate building, or a similar significant construction element.
- H. Milestone: A key or critical point in time for reference or measurement.

- I. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

1.3 SUBMITTALS

- A. Qualification Data: For firms and persons specified in "Quality Assurance" Article and in-house scheduling personnel to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Submittals Schedule: Submit [3] copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Engineer's final release or approval.
- C. Preliminary Construction Schedule: Submit 2 printed copies; one a single sheet of reproducible media, and one a print.
- D. Preliminary Network Diagram: Submit 2 printed copies; one a single sheet of reproducible media, and one a print; large enough to show entire network for entire construction period.
- E. Contractor's Construction Schedule: Submit 2 printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.
 - 1. Submit an electronic copy of schedule on CD, DVD, or flash drive. Include type of schedule (Initial or Updated) and date on label.
- F. CPM Reports: Concurrent with CPM schedule, submit [3] printed copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.
 - 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
- G. Construction Photographs: Submit a digital photo of each view within 7 days of taking photographs.
 - 1. Format: Digital JPG image with minimum resolution of 2584x1936 and image quality set to fine/high or better.
 - 2. Identification: A photo-log shall be provided containing a record for each submitted photo with the following information:
 - a. File Name of Photo.
 - b. Name of Project.
 - c. Name and address of photographer.

- d. Name of Engineer.
 - e. Name of Contractor.
 - f. Date photograph was taken.
 - g. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
- 3. Photo-logs may be scanned hard-copy forms, though digital formats such as MS Word, MS Excel or MS Access are preferred. If the delivery method for the photos is via an online file management system, photo-log records should be entered into that system provided it supports entering the above information.
 - 4. Delivery: If an online document management system or project collaboration website is used on the project, all photos and accompanying identification will be uploaded to it. Otherwise, digital photos will be delivered via traditional media such as CD, DVD, flash drive, or uploaded to an FTP site.
- H. Daily Construction Reports: Submit 2 copies at weekly intervals.
 - I. Material Location Reports: Submit 2 copies at weekly intervals.
 - J. Field Condition Reports: Submit 2 copies at time of discovery of differing conditions.
 - K. Special Reports: Submit 2 copies at time of unusual event.

1.4 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including phasing, work staging, are separations, interim milestones, and partial Owner occupancy.
 - 4. Review delivery dates for Owner-furnished products.
 - 5. Review schedule for work of Owner's separate contracts.
 - 6. Review time required for review of submittals and resubmittals.
 - 7. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 8. Review time required for completion and startup procedures.
 - 9. Review and finalize list of construction activities to be included in schedule.
 - 10. Review submittal requirements and procedures.
 - 11. Review procedures for updating schedule.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.

2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.
- C. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities including temporary lighting.

PART 2 – PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice of Award.
1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than **[20]** days, unless specifically allowed by Engineer.
 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 3. Submittal Review Time: Include review and resubmittal times indicated in Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - a. Synthetic turf material.
 4. Startup and Testing Time: Include not less than 10 days for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
 8. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Turf replacement completion.
 - b. Completion of electrical installation.
 - c. Substantial Completion.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to the Notice to Proceed, Substantial Completion, and Final Completion.
- F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
1. Refer to Section "Payment Procedures" for cost reporting and payment procedures.

- G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.
- H. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.
 - 1. Microsoft Project or equal

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within 7 days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 14 days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.5 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. High and low temperatures and general weather conditions.
 - 5. Accidents.
 - 6. Meetings and significant decisions.
 - 7. Unusual events (refer to special reports).
 - 8. Stoppages, delays, shortages, and losses.
 - 9. Meter readings and similar recording.
 - 10. Emergency procedures.
 - 11. Orders and requests of authorities having jurisdiction.
 - 12. Change Orders received and implemented.
 - 13. Work Change Directives received.
 - 14. Service connected and disconnected.
 - 15. Equipment or system tests and startups.
 - 16. Partial Completions and occupancies.

17. Substantial Completions authorized.
- B. Material Location Reports: At weekly intervals, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information on CSI Form 13.2A. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 – EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
 1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule 1 week before each regularly scheduled progress meeting.
 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Engineer, **[Construction Manager,]** Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

3.2 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified commercial photographer to take construction photographs.
- B. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.
- C. Preconstruction Photographs: Before starting construction, take 4 photographs of Project site and surrounding properties from different vantage points, as directed by Engineer. Show existing conditions adjacent to property.
- D. Periodic Construction Photographs: Take 4 color photographs monthly, coinciding with cutoff date associated with each Application for Payment. Photographer shall select vantage points to best show status of construction and progress since last photographs were taken.
 - 1. Field Office Prints: Retain an electronic set of photographs in field office at Project site, available at all times for reference. Identify photographs the same as for those submitted to Engineer.
- E. Final Completion Construction Photographs: Take 8 photographs after date of Substantial Completion for submission as Project Record Documents. Engineer will direct photographer for desired vantage points. This should be completed by a professional photographer with a minimum of three (3) years' experience photographing architectural elements. These photographs shall come with a release allowing the Owner and Engineer use for any purpose including but not limited to marketing.

END OF SECTION

SECTION 013300 – SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.1 PROVISIONS INCLUDED

- A. The Conditions of the Contract and other Sections of Division 1, General Requirements, apply to the Work under this Section.

1.2 ELECTRONIC SUBMITTAL PROCEDURES

- A. The following Construction Administration web-based Software Service is to be used General Construction Contractor or the Electrical Construction Contractor for all documentation on this project.
 - 1. BIM 360 / Autodesk Construction Cloud
- B. Summary: Shop drawing and product data submittals shall be transmitted to Architect in electronic (PDF) format using a web-based service designed specifically for transmitting submittals between all construction team members. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
- C. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
- D. Procedures:
 - 1. Create submittal log by inserting required submittals listed in individual specification sections.
 - 2. Submittal Preparation - Contractor may use any or all the following options:
 - a. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via the website.
 - b. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via email.
 - c. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
 - 3. Printed Submittals: Only provide printed submittals on request from Architect or Owners Project Manager.
 - 4. Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.
 - 5. Contractor shall transmit each submittal to Architect using the selected website service.
 - 6. Architect / Engineer review comments will be made available on the selected service exchange website for downloading. Contractor will receive email notice of completed review.
 - 7. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
 - 8. Substitution of web-based service will only be considered when submitted prior to bid date.
- E. Costs:
 - 1. None this service will be provided by the architect for use by both the General Construction and Electrical Construction Contractors.

2. The intent is for the web service cost to be in lieu of postage or shipping costs typically paid for paper submittals. Service cost is a net cost savings to Contractor because submittals sent electronically do not need to be shipped physically.
- F. Web-based service shall include hosted, web-based system for automated tracking, storage, and distribution of contract submittals, Requests for Information, and other contract related documents. FTP sites, e-mail exchanges, and server-based systems hosted from inside a contractor's office will not be considered are not acceptable.
- G. System features:
1. Automatic, configurable email reminders of past due items.
 2. Customized, automated PDF form generation for submittals, RFIs, and other documents matching standard templates used by owner, design consultants, sub-consultants, and general contractor. Documentation and demonstration of automatic form generation using each entity's templates must be submitted as part of any substitution request.
 3. Prior to project start, system vendor shall create submittal log with all required items from project manual or submittal register. Owner or primary design consultant shall have full control over required items list and access to edit, add, or remove items during project.
 4. System vendor shall provide minimum one-hour live web meeting training sessions to contractors, design consultants, sub-consultants, and owners staff prior to project start.
 5. System vendor shall make available minimum thirty-minute live web meeting training sessions for subcontractors at least twice weekly for the entire duration of the project.
 6. System vendor shall provide access for owner, design consultants, sub-consultants, general contractor, and subcontractors to live technical support by phone and email minimum of 7 AM to 6 PM EST on standard business days at no additional cost.
 7. Allowance for scanning and printing services provided by local third-party reprographic vendor to assist with obtaining documents electronically and online print ordering.
 8. At completion of project closeout, system vendor shall provide minimum of four archival discs that include all documents and tracking logs, or the ability to download this information from the live website in a single complete archive package.
 9. Design component must include automatic notifications to design team during the design phase.

1.3 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- A. Related Documents:
1. This Article supplements the General Conditions.
 2. Consult the individual Sections of the Specifications for the specific submittals required under those Sections and for further details and descriptions of the requirements.
- B. General Procedures for Submittals:
1. The Contractor shall transmit, (in accordance with item 1.2), each submittal to the Architect sufficiently in advance of performing related work or other applicable activities, so that the installation will not be delayed by processing times, including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Architect sufficiently in advance of the Work.

2. Only submittals received from and bearing the stamp of approval by the Contractor will be considered for review by the Architect. Submittals shall be accompanied by a transmittal notice stating:
 - a. Name of Project
 - b. Date of submittal
 - c. Distribution list of parties
 - d. From, including Contractor, Subcontractor, Installer, Manufacturer and/or Supplier
 - e. Specification Section or Drawing No. to which the submittal refers
 - f. Purpose (first submittal, resubmittal)
 - g. Description, remarks
 - h. Signature of transmitter.
- C. Submittal Schedule:
1. No later than thirty (30) days after the notice to proceed, the General Contractor shall submit to the Architect for approval a schedule for submittal of all shop drawings for the project.
- D. Submission of Shop Drawings:
1. Shop Drawings shall be complete, give all information necessary or requested in the individual Sections of the Specifications, and also show adjoining work and details of connection thereto.
 2. The Architect reserves the right to review and approve Shop Drawings only after approval of related Project Data and Samples.
 3. Shop Drawings shall be properly identified and contain name of Project, name of firm submitting the Shop Drawings, Shop Drawing number, date of Shop Drawing, and of revisions, Contractor's stamp of approval, and sufficient spaces near the title block for the Architect's stamp.
 4. Shop Drawings shall be legible. Failure to provide legible shop drawings will result in immediate rejection.
 5. The contractor shall submit a final electronic version in PDF format with the as-built Drawings a copy of all the approved Shop Drawings.
- E. Submission of Product Data:
1. The Contractor shall submit Product Data that is specific to the project. Identification of material or equipment choices submitted shall be clearly made. Data of general nature will not be accepted.
 2. Product Data shall be accompanied by transmittal notice. The Contractor's stamp of approval shall appear on the information itself, in a location which will not mar legibility.
 3. Product Data of items of interior finishes shall be submitted all at once to permit a coordinated selection of colors and finishes.
 4. Product Data returned by the Architect with the stamp "Revise and Resubmit" or "Rejected", shall be resubmitted in the manner specified hereinabove until the Architect's approval is obtained.
 5. When the Product Data are acceptable, the Architect will stamp them "Reviewed" or "Reviewed with Comments" and return the remaining copies electronically to the Contractor. The Contractor shall distribute this Data as required for his own and his Subcontractor's use.
- F. Submission of Samples:
1. Unless otherwise specified in the individual Section, the Contractor shall submit two (2) specimens of each sample.

2. Samples shall be of adequate size to permit proper evaluation of material. Where variations in color or in other characteristics are typical, submit samples for each variation except such as may be waived by the Architect.
3. Samples of items of interior finishes shall be submitted all at once to permit a coordinated selection of colors and finishes.
4. All Samples shall be sent to the Architect, accompanied by transmittal notice. Transmittal shall also be submitted through the web-based system. On the transmittal notice the Contractor shall stamp his approval of samples.
5. The Architect's review and response to the Sample shall be submitted through the web-based system.
6. If sample is rejected by the Architect, a new sample shall be resubmitted in the manner specified hereinabove. This procedure shall be repeated until sample is approved in writing by the Architect.
7. Samples will be returned to the contractor at the option of the Architect.
8. All rights are reserved to require submission of samples whether or not particular mention thereof is made in the Specifications.

1.4 PROJECT SCHEDULE

- A. No later than thirty (30) days after the notice to proceed the Contractor shall submit to the Architect for approval, a progress schedule in the form described in the Specifications, showing in detail the proposed progress for the construction of the various parts of the Work and the proposed times for receiving materials required. The Contractor shall at the end of each month, or more often if required, furnish the Architect a schedule showing actual progress of the various parts of the work in comparison with the originally proposed progress schedule as approved. The time in which the various portions and the whole of this contract are to be performed and the work is to be completed is of the essence of the agreement.

1.5 REQUESTS FOR INFORMATION (RFIS)

- A. Contractor may submit electronically via the website service a Request For Information (RFI) to the Architect seeking clarification or interpretation of conflicts, errors, discrepancies, or ambiguities in the Contract Documents. It must be presented in writing, on the approved form. An oral RFI or an RFI presented on an unapproved form will not be accepted. Any project delay caused by Architect's refusal to accept an oral RFI or an RFI presented on an unapproved form will be attributed solely to the Contractor.
- B. Architect's review of or responses to RFIs shall not constitute an approval, direction, or procedure related to the construction means, methods, techniques, sequences, or procedures of Contractor.
- C. Architect's review of or responses to RFIs shall not constitute an approval, direction or procedure related to the construction site safety precautions, procedures, or methodology of Contractor.
- D. The use of an RFI is limited to clarification of the contract documents. Contractor will limit each RFI to a single issue.
- E. Information which is discernible from the contract documents, requests in regard to construction means and methods and construction site safety will not be addressed by the Architect in responding to an RFI. For RFI that solely pertain to these issues, upon request from the Architect the Contractor shall void the RFI and remove it from the log.

1.6 CAD/BIM DRAWINGS

- A. The CAD or BIM files containing the project drawings are work product of the Architect/Engineer and their consultants.
- B. The CAD or BIM files are live documents and cannot be disabled for “view only”. Therefore, authorization and release are required prior to making electronic files available for use by the Successful contractor or sub-contractors.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 014000 – QUALITY REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.3 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

1.4 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

- C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
 2. Description of test and inspection.
 3. Identification of applicable standards.
 4. Identification of test and inspection methods.
 5. Number of tests and inspections required.
 6. Time schedule or time span for tests and inspections.
 7. Entity responsible for performing tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality-control service.
- D. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Ambient conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- E. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E548, and that specializes in types of tests and inspections to be performed. Each testing agency shall be authorized by the authorities having jurisdiction in the state in which the project is located.
- H. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
 - d. When testing is complete, remove assemblies; do not reuse materials on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.6 RETAIN BELOW AS THE DEFAULT REQUIREMENT AND ADD SPECIFIC REQUIREMENTS IN INDIVIDUAL SPECIFICATION SECTIONS.QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
 - 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 - 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

- B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.
1. Testing agency will notify Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Engineer with copy to Contractor and to authorities having jurisdiction.
 3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 5. Testing agency will retest and reinspect corrected work.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.

- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field-curing of test samples.
 - 5. Delivery of samples to testing agencies.
 - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work (i.e., Notice to Proceed).
 - 1. Distribution: Distribute schedule to Owner, Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
 - 2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 014534 – STRUCTURAL TESTS AND SPECIAL INSPECTIONS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Structural Tests and Special Inspections shall be in accordance with Chapter 17 of the 2020 Building Code of New York State.
- B. The program of Structural Tests and Special Inspections is a Quality Assurance program intended to ensure that the work is performed in accordance with the Contract Documents.
- C. This specification section is intended to inform the Contractor of the Owner's quality assurance program and the extent of the Contractor's responsibilities. This specification section is also intended to notify the Special Inspector, Testing Laboratory, and other Agents of the Special Inspector of their requirements and responsibilities.

1.2 SCHEDULE OF INSPECTIONS AND TESTS

- A. Required inspections and tests are described in the attached Schedule of Special Inspection and in the individual specification Sections for the items to be inspected or tested.

1.3 QUALIFICATIONS

- A. A Special Inspector shall be a qualified individual who is approved by the Code Enforcement Official.
- B. The registered design professional (RDP) in responsible charge acting as the Owner's agent and the Code Enforcement Official shall approve the Testing Laboratory and individual inspectors/technicians.
- C. The testing laboratory shall maintain a full time licensed Professional Engineer on staff who shall certify all test reports. The Engineer shall be responsible for the training of the testing technicians and shall be in responsible charge of the field and laboratory testing operations.

1.4 SUBMITTALS

- A. The Special Inspector and Testing Laboratory shall submit to the RDP and Code Enforcement Official for review a copy of their qualifications, which shall include the names and qualifications of each of the individual inspectors and technicians who will be performing inspections or tests.
- B. The Special Inspector and Testing Laboratory shall disclose any past or present business relationship or potential conflict of interest with the Contractor or any of the Subcontractors whose work will be inspected or tested.

1.5 PAYMENT

- A. The Owner shall engage and pay for the services of the RDP, Special Inspector, Agents of the Special Inspector, and Testing Laboratory.
- B. If any materials which require Special Inspections are fabricated in a plant which is not located within 100 miles of the project, the Contractor shall be responsible for the travel expenses of the Special Inspector or Testing Laboratory.

- C. The Contractor shall be responsible for the cost of any re-testing or re-inspection of work, which fails to comply with the requirements of the Contract Documents.

1.6 CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall cooperate with the Special Inspector and his agents so that the Special Inspections and testing may be performed at appropriate times and without hindrance.
- B. The Contractor shall review the Schedule of Inspections and shall be responsible for coordinating and scheduling inspections and tests. The Contractor shall notify the Special Inspector or Testing Laboratory at least 24 hours in advance of a required inspection or test. Uninspected work that required inspection may be rejected solely on that basis.
- C. The Contractor shall provide incidental labor and facilities to provide access to the work to be inspected or tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
- D. The Contractor shall keep at the project site the latest set of construction drawings, field sketches, approved shop drawings, and specifications for use by the inspectors and testing technicians.
- E. The Special Inspection program shall in no way relieve the Contractor of his obligation to perform work in accordance with the requirements of the Contract Documents or from implementing an effective Quality Control program. The Contractor's quality control personnel shall first review all work that is to be subjected to Special Inspections.
- F. The Contractor shall be solely responsible for construction site safety.

1.7 LIMITS ON AUTHORITY

- A. The Special Inspector or Testing Laboratory may not release, revoke, alter, or enlarge on the requirements of the Contract Documents.
- B. The Special Inspector or Testing Laboratory will not have control over the Contractor's means and methods of construction.
- C. The Special Inspector or Testing Laboratory shall not be responsible for construction site safety.
- D. The Special Inspector or Testing Laboratory has no authority to stop the work.

1.8 STATEMENT OF SPECIAL INSPECTIONS

- A. The registered design professional (RDP) will prepare the Schedule of inspections
- B. The Schedule of Inspections and any required Quality Assurance Plans shall be submitted to the Code Enforcement Official with the application for Building Permit.

1.9 RECORDS AND REPORTS

- A. Detailed daily reports shall be prepared of each inspection or test and submitted to the RDP and Owner. Reports shall include:
 - 1. Date of test or inspection.
 - 2. Name of inspector or technician.
 - 3. Location of specific areas tested or inspected.

4. Description of test or inspection and results.
 5. Applicable ASTM standard or other code.
 6. Weather conditions.
- B. The Special Inspector shall submit interim reports to the Code Enforcement Official at the end of each week which include all inspections and test reports received that week. Copies shall be sent to the RDP, Architect, and Contractor.
- C. Any discrepancies from the Contract Documents found during a Special Inspection shall be immediately reported to the Contractor. The Special Inspector shall notify the RDP and Code Enforcement Official. Reports shall document all discrepancies identified and the corrective action taken.
- D. The Testing Laboratory shall immediately notify the Special Inspector and the RDP by telephone or fax of any test results, which fail to comply with the requirements of the Contract Documents.
- E. Reports shall be submitted to the RDP within 7 days of the inspection or test. Hand written reports may be submitted if final typed copies are not available.
- F. At the completion of the work requiring Special Inspections, each inspection agency and testing laboratory shall provide a statement to the RDP that all work was completed in substantial conformance with the Contract Documents and that all appropriate inspections and tests were performed.

1.10 FINAL REPORT OF SPECIAL INSPECTIONS

- A. The Final Report of Special Inspections shall be completed by the RDP and submitted to the Code Enforcement Official as a condition for issuance of a Certificate of Use and Occupancy.
- B. The Final Report of Special Inspections will certify that all required inspections have been performed and will itemize any discrepancies that were not corrected or resolved.

PART 2 – PRODUCTS (not applicable)

PART 3 – EXECUTION

3.1 SPECIAL INSPECTIONS

- A. The following tables comprise the required schedule of Special Inspections for this project. The construction divisions which require Special Inspections for this project are as follows:
1. Soils and Foundations.
 2. Cast-In-Place Concrete.
 3. Precast Concrete.
 4. Masonry.
 5. Structural Steel.
 6. Electrical Systems.

- B. Qualifications of Inspectors and Testing Technicians
1. The qualifications of all personnel performing Special Inspection activities are subject to the approval of the Code Enforcement Official. The credentials of all Inspectors and testing technicians shall be provided if requested.
 2. The person administering the Special Inspections program shall be a Professional Engineer experienced in the design of buildings.
- C. Minimum Qualifications of Inspection Agents: When the RDP deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear as the Inspection Agent in table above.
1. SE Structural Engineer – a licensed PE specializing in the design of building structures. This may be required for the inspection of critical structural elements.
 2. GE Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations. This may be required for the inspection of difficult soil conditions or deep foundations.
 3. EIT Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination. This may be required for the inspection of elements that require some engineering training to properly evaluate.
 4. ACI American Concrete Institute - Level I Certified Concrete Field Testing Technician. This certification is appropriate for individuals performing concrete sampling, slump tests, air content tests, temperature tests, unit weight tests, and casting compression test cylinders.
 5. AWS American Welding Society - Certified Welding Inspector (CWI). This certification is appropriate for individuals performing visual inspection of welds.
 6. ASNT American Society of Non-Destructive Testing – Level II or III. This certification is appropriate for individuals performing ultra-sonic testing of welds.
 7. SMSI Structural Masonry Special Inspector – certification by ICBO. SWSI Structural Steel and Welding Special Inspector – certification by ICBO.
 8. PCSI Prestressed Concrete Special Inspector – certification jointly sponsored by ICBO, BOCA and SBCCI with participation form PCI and PTI.
 9. RCSI Reinforced Concrete Special Inspector – certification jointly sponsored by ACI, ICBO, BOCA and SBCCI.

3.2 SCHEDULES

- A. Schedule of Special Inspections – Soils and Foundations:

SCHEDULE OF SPECIAL INSPECTION - SOILS AND FOUNDATIONS					
Verification/Inspection	Agent No.	Cont.	Periodic	Referenced Standard	BC-NYS Reference
1. Soils:					
a. Verify site preparation. Review proof-rolling.		X	--		1704.7.1
b. Review submittals for fill materials.		--	X		1704.7.2
c. Verify use of fill material and lift thickness in field.		--	X		1704.7.2
d. Review footing bearing strata		--	X		
e. Review slab subgrade and subbase preparation.		--	X		
2. Compaction Testing:					
a. One test for each spread footing, for each 20-foot length of strip footing, and for each 2,000 sf of building area.		--	X		1704.3

B. Schedule of Special Inspection – Cast-in-Place Concrete

SCHEDULE OF SPECIAL INSPECTION - CAST-IN-PLACE CONCRETE					
Verification/Inspection	Agent No.	Cont.	Periodic	Referenced Standard	BC-NYS Reference
1. Inspection of reinforcing steel, including prestressing tendons and placement		--	X	ACI 318: 3.5, 7.1-7.7	1903.5 1907.1 1907.7
a. Footings and frost walls.		--	X		
b. Slabs on grade.		--	X		
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5B				AWS D1.4 ACI 318:3.5.2	1903.5.2
3. Inspect anchor rods to be installed in concrete prior to and during placement of concrete:					
a. At columns in braced frames, and elsewhere where rods are subject to shear or tension.		X	--		1912.5
4. Verifying use of required design mix.		X	--	ACI 318: Ch.4, 5.2-5.4	1904, 1905.2, 1905.4, 1914.2, 1914.3
5. Sampling fresh concrete and performing slump, air content, unit weight and determining the temperature of fresh concrete at the time of making specimens for strength tests.		X	--	ASTM C172 ASTM C31 ACI 318: 5.6, 5.8	1905.6, 1914.10
6. Inspection of concrete for proper application techniques.		X	--	ACI 318: 5.9, 5.10	1905.9, 1905.10, 1914.6, 1914.7, 1914.8
7. Inspection for maintenance of specified curing temperature and techniques.		X	-	ACI 318: 5.11- 5.13	1905.11, 1905.13, 1914.9
9. Erection of precast concrete members			X	ACI 318: Ch.16	

END OF SECTION

SECTION 015000 – TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes requirements for temporary services, facilities, and controls including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Sewers and drainage.
 - 2. Water service and distribution.
 - 3. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
 - 4. Heating and cooling facilities.
 - 5. Ventilation.
 - 6. Electric power service.
 - 7. Lighting.
 - 8. Telephone service
- C. Temporary construction and support facilities include, but are not limited to, the following:
 - 1. Temporary roads and paving.
 - 2. Dewatering facilities and drains.
 - 3. Project identification and temporary signs.
 - 4. Waste disposal facilities.
 - 5. Field offices.
 - 6. Storage and fabrication sheds.
 - 7. Lifts and hoists.
 - 8. Temporary stairs.
 - 9. Construction aids and miscellaneous services and facilities.
 - 10. Rodent and pest control.
 - 11. Temporary enclosures.
 - 12. Temporary heat.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Environmental protection.
 - 2. Stormwater control.
 - 3. Tree and plant protection.
 - 4. Pest control.
 - 5. Sidewalk bridge and/or site enclosure fence.
 - 6. Security enclosure and lockup.
 - 7. Barricades, warning signs, and lights.
 - 8. Covered walkways.
 - 9. Temporary enclosures.
 - 10. Temporary partitions.
 - 11. Fire protection.

1.2 DEFINITIONS

- A. Permanent Enclosure: As determined by Engineer, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.3 USE CHARGES

- A. General: The cost of all use charges for temporary facilities are not chargeable to Owner or Engineer and shall be included in the Contract Sum. The contractor shall be responsible for paying all use charges until the project is substantially complete. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
 - 1. Owner's construction forces.
 - 2. Occupants of Project.
 - 3. Engineer.
 - 4. Testing agencies.
 - 5. Personnel of authorities having jurisdiction.
- B. Sewer Service: Pay sewer service use charges for sewer usage, by all parties engaged in construction, at Project site.
- C. Water Service: Use water from Owner's existing water system without metering and without payment of use charges.
- D. Electric Power Service: Use electric power from Owner's existing system without metering and without payment of use charges.

1.4 SUBMITTALS

- A. Temporary Utility Reports: Submit reports of tests, inspections, utility billings, and similar procedures performed on temporary utilities.
- B. Implementation and Termination Schedule: Within 15 days of date established for submittal of Contractor's Construction Schedule, submit a schedule indicating implementation and termination of each temporary utility.

1.5 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
 - 1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
 - 2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
 - 3. Refer to Guidelines for Bid Conditions for Temporary Job Utilities and Services, prepared jointly by AGC and ASC, for industry recommendations.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
 - 1. Building Code requirements.

2. Health and safety regulations.
3. Utility company regulations.
4. Police, Fire Department and Rescue Squad rules.

1.6 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service. Prepare a schedule indicating date for implementation and terminations of each temporary facility.
 1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
 1. Keep temporary services and facilities clean and neat.
 2. Relocate temporary services and facilities as required by progress of the Work.
 3. Operate in a safe and efficient manner.
 4. Take necessary fire prevention measures.
 5. Do not overload facilities or permit them to interfere with progress.
 6. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Engineer. Provide materials suitable for use intended.
- B. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.76-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails with galvanized barbed-wire top strand.
- C. Portable Chain-Link Fencing: Minimum 2-inch (50-mm) 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.
- D. Lumber and Plywood:
 1. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
 2. For fences and vision barriers, provide exterior type, minimum 3/8-inch thick plywood.
 3. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8-inch thick exterior plywood.
- E. Gypsum Board: Minimum 1/2 inch (12.7 mm) thick by 48 inches (1219 mm) wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C36.

- F. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively.
- G. Paint:
 - 1. For job-built temporary offices, shops, sheds, fences and other exposed lumber and plywood, provide exterior grade acrylic-latex emulsion over exterior primer.
 - 2. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.
 - 3. For interior walls of temporary offices, provide two coats interior latex flat wall paint.
- H. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
- I. Water: Provide potable water approved by local health authorities

2.2 EQUIPMENT

- A. General: Provide new equipment; if acceptable to the Engineer, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Field Offices: Use of the existing building is available for use as a field office for the General Construction and Electrical Construction Contractors. .
- C. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- D. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- E. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.
 - 1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 DegF (7.2 to 12.7 DegC).
- F. Heating Equipment: Use of existing building heating equipment.
- G. Electrical Outlets: Use of existing building electrical outlets
- H. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.
- I. Lamps and Light Fixtures: Use of existing building light fixtures..

- J. Water Hoses: Provide 3/4 inch heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.
- K. First Aid Supplies: Comply with governing regulations.
- L. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials, and equipment. Comply with utility company recommendations.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
 - 1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
 - 2. Connect temporary sewers to municipal system as directed by sewer department officials.
 - 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
 - 4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.
- C. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

1. Provide rubber hoses as necessary to serve Project site.
 2. As soon as water is required at each level, extend service to form a temporary water- and fire-protection standpipe. Provide distribution piping. Space outlets so water can be reached with a 100-foot (30-m) hose. Provide one hose at each outlet.
 3. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 2. Toilets: Use of Owner's existing toilet facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use. Provide separate facilities for male and female personnel.
 3. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
 - a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 DegF (7.2 to 12.7 DegC).
- E. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.
1. Install electric power service underground, unless overhead service must be used.
 2. Install power distribution wiring overhead and rise vertically where least exposed to damage.
 3. Connect temporary service to Owner's existing power source as directed by electric company officials.
- F. Electric Power Service: Use of Owner's existing electric power service will be permitted as long as equipment is maintained in a condition acceptable to Owner.
- G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
 2. Provide warning signs at power outlets other than 110 to 120 V.
 3. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
 4. Provide metal conduit enclosures or boxes for wiring devices.
 5. Provide 4-gang outlets, spaced so 100 foot (30 m) extension cord can reach each area for power hand tools and task lighting. Provide a separate 125-V ac, 20-A circuit for each outlet.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 2. Provide one 100-W incandescent lamp per 500 square feet (45 square meters), uniformly distributed, for general lighting, or equivalent illumination.

3. Provide one 100-W incandescent lamp every 50 feet (15 meter) in traffic areas.
4. Provide one 100-W incandescent lamp per story in stairways and ladder runs, located to illuminate each landing and flight.
5. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.
6. Install lighting for Project identification sign.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
 2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines. Comply with NFPA 241.
 3. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate to support loads and to withstand exposure to traffic during construction period. Locate temporary roads and paved areas within construction limits indicated on Drawings.
 1. Provide a reasonably level, graded, well-drained subgrade of satisfactory soil material, compacted to not less than 95 percent of maximum dry density in the top 6 inches (150 mm).
 2. Provide gravel paving course of subbase material not less than 3 inches (75 mm) thick; roller compacted to a level, smooth, dense surface.
 3. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate to support loads and to withstand exposure to traffic during construction period. Locate temporary roads and paved areas in same location as permanent roads and paved areas. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
 1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Division 32 Section "Earthwork."
 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
 4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Division 32 Section "Hot-Mix Asphalt Paving."
- D. Traffic Controls: Provide temporary traffic controls at junction of temporary roads with public roads. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction.
- E. Dewatering Facilities and Drains: Comply with requirements in applicable Division 2 Sections for temporary drainage and dewatering facilities and operations not directly associated with construction activities included in individual Sections. Where feasible, use same facilities. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining property nor endanger permanent Work or temporary facilities.
 2. Before connection and operation of permanent drainage piping system, provide temporary drainage where roofing or similar waterproof deck construction is completed.
 3. Remove snow and ice as required to minimize accumulations.
- F. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.
1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
 2. Prepare temporary signs to provide directional information to construction personnel and visitors.
 3. Construct signs of exterior-type Grade B-B high-density concrete form overlay plywood in sizes and thicknesses indicated. Support on posts or framing of preservative-treated wood or steel.
 4. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.
- G. Waste Disposal Facilities: Collect waste from construction areas and elsewhere daily. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
 2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.
- H. Janitorial Services: Provide janitorial services on a daily basis for temporary offices, first-aid stations, toilets, wash facilities, lunchrooms, and similar areas.
- I. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.
1. Construct framing, sheathing, and siding using fire-retardant-treated lumber and plywood.
 2. Paint exposed lumber and plywood with exterior-grade acrylic-latex emulsion over exterior primer.
- J. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.
- L. Existing Stair Usage: Use of Owner's existing stairs will be permitted, as long as stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If, despite such protection, stairs become damaged, restore damaged areas so no evidence remains of correction work.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.
- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.
- D. Pest Control: Before deep foundation work has been completed, retain a local exterminator or pest-control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Engage this pest-control service to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.
- E. Site Enclosure Fence: Before construction operations begin, install chain-link enclosure fence with lockable entrance gates. Locate where indicated, or enclose entire Project site or portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.
 1. Set fence posts in compacted mixture of gravel and earth.
 2. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.
 3. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys and / or access codes.
- F. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
 1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- G. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
 1. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8 inch (16 mm) thick exterior plywood.
- H. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

- I. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
 - a. Field Offices: Class A stored-pressure water-type extinguishers.
 - b. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
 - c. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
 2. Store combustible materials in containers in fire-safe locations.
 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fire fighting. Prohibit smoking in hazardous fire-exposure areas.
 4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
 5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
 6. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 7. Provide hoses for fire protection of sufficient length to reach construction areas. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.
- D. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Unless the Engineer requests that it be maintained longer, remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION

SECTION 016000 – PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the following administrative and procedural requirements: selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

1.2 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility [**except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise**]. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.
- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.3 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
 - 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 - 2. Form: Tabulate information for each product under the following column headings:
 - a. Specification Section number and title.
 - b. Generic name used in the Contract Documents.
 - c. Proprietary name, model number, and similar designations.

- d. Manufacturer's name and address.
 - e. Supplier's name and address.
 - f. Installer's name and address.
 - g. Projected delivery date or time span of delivery period.
 - h. Identification of items that require early submittal approval for scheduled delivery date.
3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 - a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.
 4. Completed List: Within 45 days after date of commencement of the Work, 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 5. Engineer's Action: Engineer will respond in writing to Contractor within 15 days of receipt of completed product list. Engineer's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Engineer's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.
- B. Substitution Requests: Requests for substitution will be considered if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Engineer. Submit 3 copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use CSI Form 13.1A.
 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.

- k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
 - 3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
 - a. Form of Acceptance: Change Order.
 - b. Use product specified if Engineer cannot make a decision on use of a proposed substitution within time allocated.
- C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.
- D. Warranty and Bond Submittals: Submit written warranties to the Engineer prior to the date certified for Substantial Completion. If the Engineer's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Engineer.
 - 1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Engineer within fifteen days of completion of that designated portion of the Work.
 - 2. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Engineer for approval prior to final execution.
 - 3. Forms for special warranties are included at the end of this Section. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer. Submit a draft to the Owner through the Engineer for approval prior to final execution.
 - a. Refer to individual Sections of Divisions-2 through -48 for specific content requirements, and particular requirements for submittal of special warranties.
 - 4. Form of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 5. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
 - a. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
 - b. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS," the Project title or name, and the name of the Contractor.
 - c. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.
- B. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
 - 1. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete project requirements in a timely manner, consult with the Engineer for a determination of the most important product qualities before proceeding. Qualities may include attributes relating to visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources that produce products that possess these qualities, to the fullest extent possible.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
 - 5. Store products to allow for inspection and measurement of quantity or counting of units.
 - 6. Store materials in a manner that will not endanger Project structure.
 - 7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 9. Protect stored products from damage.
- B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.
 3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Warranty Requirements: Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
1. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
 2. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
 3. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
 - a. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
 4. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

PART 2 – PRODUCTS

2.1 PRODUCT OPTIONS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 5. Where products are accompanied by the term "match sample," sample to be matched is Engineer's.
 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures: Procedures for product selection include the following:
1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
 - a. Substitutions may be considered, unless otherwise indicated.
 2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
 - a. Substitutions may be considered, , unless otherwise indicated
 3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
 - a. Substitutions may be considered, , unless otherwise indicated.
 4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
 - a. Substitutions may be considered, unless otherwise indicated
 5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
 6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
 7. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Comply with provisions in "Product Substitutions" Article.
 8. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Products" are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Substitutions **[may] [will not]** be considered, unless otherwise indicated.
 9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Engineer's sample. Engineer's decision will be final on whether a proposed product matches satisfactorily.
 - a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.
 10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.
 - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Engineer will select color, pattern, or texture from manufacturer's product line that does not include premium items.

- b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Engineer will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.
- 11. Allowances: Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection and for procedures required for processing such selections.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received within 30 days the Notice of Award. Requests received after that time may be considered or rejected at discretion of Engineer.
- B. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 - 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - 2. Requested substitution does not require extensive revisions to the Contract Documents.
 - 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4. Substitution request is fully documented and properly submitted.
 - 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 - 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 7. Requested substitution is compatible with other portions of the Work.
 - 8. Requested substitution has been coordinated with other portions of the Work.
 - 9. Requested substitution provides specified warranty.
 - 10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
 - 11. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
 - 12. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
 - 13. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.

2.3 COMPARABLE PRODUCTS

- A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:
 - 1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.

4. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners, if requested.
5. Samples, if requested.

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 017300 – EXECUTION REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Coordination of Owner-installed products.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.

1.2 SUBMITTALS

- A. Qualification Data: For land surveyor or professional engineer to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.
- C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- D. Certified Surveys: Submit 2 copies signed by land surveyor or professional engineer.
- E. Final Property Survey: Submit 3 copies showing the Work performed and record survey data.

1.3 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Engineer's Qualifications: A professional Engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than 48 hours in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.

- C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents. Submit requests on CSI Form 13.2A, "Request for Interpretation."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.
- B. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.
 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 3. Inform installers of lines and levels to which they must comply.
 4. Check the location, level and plumb, of every major element as the Work progresses.
 5. Notify Engineer when deviations from required lines and levels exceed allowable tolerances.
 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer [**and Construction Manager**].

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Engineer before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of 2 permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- E. Final Property Survey: Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 2. Allow for building movement, including thermal expansion and contraction.
- G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
 - 1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.

- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 017329 – CUTTING AND PATCHING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Refer to other sections for specific requirements and limitations applicable to cutting and patching individual parts of the work.
 - 1. Requirements in this Section apply to mechanical and electrical installations. Refer to Division 26 Sections for other requirements and limitations applicable to cutting and patching of mechanical and electrical installations.

1.2 DEFINITIONS

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe the extent of cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to Existing Construction: Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate dates when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - 7. Engineer's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right of the Engineer to later require removal and replacement of unsatisfactory work.
 - 8. Describe means for the protection of adjacent areas to where cutting and patching shall take place.

1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

- a. Below is a list of elements that should be considered and reviewed with the Engineer prior to cutting: Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Stair systems.
 - e. Miscellaneous structural metals.
- B. Operational Elements: Do not cut and patch the following **wing**] operating elements or safety related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
1. Primary operational systems and equipment.
 2. Air or smoke barriers.
 3. Fire-protection systems.
 4. Control systems.
 5. Communication systems.
 6. Electrical wiring systems.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
1. Water, moisture, or vapor barriers.
 2. Membranes and flashings.
 3. Exterior curtain-wall construction.
 4. Equipment supports.
 5. Piping, ductwork, vessels, and equipment.
 6. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
 - a. Processed concrete finishes.
 - b. Stonework and stone masonry.
 - c. Ornamental metal.
 - d. Roofing.
 - e. Firestopping.
 - f. Fluid-applied flooring.
 - g. Aggregate wall coating.
 - h. Wall covering.
- E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Prior to cutting existing services, examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed. Take corrective action before proceeding. If unsafe or unsatisfactory conditions are encountered, investigate both sides of the surface involved. Determine exact location of structural members.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary shoring and support of Work to be cut to prevent settlement or other damage to existing construction to remain.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.
- E. Take all precautions necessary to avoid cutting existing pipe, conduit, or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, where cutting is required, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Existing Finished Surfaces: To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
 5. Electrical Services: Bypass utility services such as pipe or conduit, before cutting, where services are shown or required to be moved, relocated, or abandoned. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Comply with specified tolerances. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Perform patching around items penetrating existing construction in a manner that will maintain the water and fire resistive capability of the existing construction.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - b. Where surfaces exposed by removals are to remain as exposed surfaces, paint such areas to match adjacent surfaces as closely as practicable using paint with the same characteristics and appearance as the existing to remain.
 4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

6. Where reinstallation of removed items is indicated, reinstall them to a condition equal to or better than their condition before removal.

END OF SECTION

SECTION 017700 – CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project Record Documents.
 - 3. Operation and maintenance manuals.
 - 4. Warranties.
 - 5. Instruction of Owner's personnel.
 - 6. Final cleaning.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 8. Complete startup testing of systems.
 - 9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 10. Advise Owner of changeover in heat and other utilities.
 - 11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 12. Complete final cleaning requirements, including touchup painting.
 - 13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 - 2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit pest-control final inspection report and warranty.
 - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.

- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.

- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
 - 1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 - 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - 3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 - 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Note related Change Orders, Record Drawings, and Product Data, where applicable.

- D. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Drawings[, and Record Specifications], where applicable.

- E. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.5 OPERATION AND MAINTENANCE MANUALS

- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
 - 1. Operation Data:
 - a. Emergency instructions and procedures.
 - b. System, subsystem, and equipment descriptions, including operating standards.
 - c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
 - d. Description of controls and sequence of operations.
 - e. Piping diagrams.
 - 2. Maintenance Data:
 - a. Manufacturer's information, including list of spare parts.
 - b. Name, address, and telephone number of Installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventive and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of maintenance service agreements.
 - h. Copies of warranties and bonds.

- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 – EXECUTION

3.1 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Provide instructors experienced in operation and maintenance procedures.
 - 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
 - 3. Schedule training with Owner, through Engineer with at least 7 days advance notice.
 - 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.
- B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
 - 1. System design and operational philosophy.
 - 2. Review of documentation.
 - 3. Operations.

4. Adjustments.
5. Troubleshooting.
6. Maintenance.
7. Repair.

3.2 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - m. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to unusual operating conditions.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction.

- r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - s. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 017823 – OPERATION AND MAINTENANCE DATA

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 1. Operation and maintenance documentation directory.
 2. Emergency manuals.
 3. Operation manuals for systems, subsystems, and equipment.
 4. Maintenance manuals for the care and maintenance of products, materials, and finishes; systems and equipment.

1.2 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 SUBMITTALS

- A. Initial Submittal: Submit 2 draft copies of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Engineer will return one copy of draft and mark whether general scope and content of manual are acceptable.
- B. Final Submittal: Submit 1 copy of each manual in final form at least 15 days before final inspection. Engineer will return copy with comments within 15 days after final inspection.
 1. Correct or modify each manual to comply with Engineer's comments. Submit 3 copies of each corrected manual within 15 days of receipt of Engineer's comments.

1.4 COORDINATION

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 – PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Organization: Include a section in the directory for each of the following:
 1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name, address, and telephone number of Contractor.
 - 6. Name and address of Engineer.
 - 7. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
 - 1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (115-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included

in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (115-by-280-mm), 20-lb/sq. ft. (75-g/sq. m) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions.
 2. Performance and design criteria if Contractor is delegated design responsibility.
 3. Operating standards.

4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.

2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in the manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard printed maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training videotape, if available.

- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 – EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.

2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."
- G. Comply with Division 1 Section "Closeout Procedures" for the schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 017839 – PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Record Samples.

1.2 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit 2 sets of marked-up Record Prints.
 - 2. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal: Submit 1 set of plots from corrected Record CAD Drawings and 1 set of marked-up Record Prints. Engineer will initial and date each plot and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Engineer will return plots and prints for organizing into sets, printing, binding, and final submittal.
 - b. Final Submittal: Submit 1 set of marked-up Record Prints, 1 set of record transparencies, and 3 copies printed from Record Transparencies. Print each Drawing, whether or not changes and additional information were recorded.
 - c. Final Submittal: Submit 1 set of marked-up Record Prints, 1 set of Record CAD Drawing files, 1 set of Record CAD Drawing plots, and 3 copies printed from record plots. Plot and print each Drawing, whether or not changes and additional information were recorded.
 - 1) Electronic Media: CD-ROM or flash drive.
- B. Record Specifications: Submit 1 copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit 1 copy of each approved Product Data submittal.
 - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as Record Product Data.

PART 2 – PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
 - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Locations of concealed internal utilities.
 - i. Changes made by Change Order or Work Change Directive.
 - j. Changes made following Engineer's written orders.
 - k. Details not on the original Contract Drawings.
 - l. Field records for variable and concealed conditions.
 - m. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Work Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Engineer. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.
1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
 2. Refer instances of uncertainty to Engineer for resolution.
 3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.
 4. Print the Contract Drawings and Shop Drawings for use as Record Transparencies. Engineer will make the Contract Drawings available to Contractor's print shop.
- C. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Engineer. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
 2. Format: DWG Version 2022, operating in Windows 10 operating system.
 3. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
 4. Refer instances of uncertainty to Engineer for resolution.

5. Engineer will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
 - a. Engineer makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.
 - b. CAD Software Program: The Contract Drawings are available in AutoCAD 2022 operating in Windows 10 operating system.

- D. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing Record Drawings where Engineer determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult with Engineer for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

- E. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
 3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of the manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 5. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, Record Drawings, and Product Data where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

2.5 RECORD SAMPLE SUBMITTAL

- A. Immediately prior to date of Substantial Completion, the Contractor shall meet with the Engineer and, if desired, the Owner's personnel at the site to determine which of the Samples maintained during the construction period shall be transmitted to Owner for record purposes. Comply with the Engineer's instructions for packaging, identification marking, and delivery to Owner's Sample storage space. Dispose of other Samples in manner specified for disposal of surplus and waste materials.

PART 3 – EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.

END OF SECTION

SECTION 017900 – DEMONSTRATION AND TRAINING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
- B. Allowances: Furnish demonstration and training instruction time under the Demonstration and Training Allowance as specified in Division 1 Section "Allowances."
- C. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up.

1.2 SUBMITTALS

- A. Instruction Program: Submit 2 copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. At completion of training, submit 1 complete training manual for Owner's use.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of ENGINEERS and owners, and other information specified.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.
- E. Demonstration and Training DVD: Submit 1 copy at end of each training module.

1.3 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 1 Section "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Pre-Instruction Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 - 1. Inspect and discuss locations and other facilities required for instruction.

2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.4 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Engineer.

PART 2 – PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
 1. Fire-protection systems, including fire alarm systems.
 2. Intrusion detection systems.
 3. Electrical service and distribution systems.
 4. Lighting equipment and control.
 5. Communication systems equipment.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project Record Documents.

- e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Engineer will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
 - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Engineer, with at least 7 days' advance notice.
- D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral and / or a demonstration performance-based test as applicable.
- E. Demonstration and Training DVD: Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. Comply with requirements in Division 1 Section "Photographic Documentation."
 - 2. At beginning of each training module, record each chart containing learning objective and lesson outline.
- F. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION

SECTION 116820 – OUTDOOR SPORTS EQUIPMENT

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Provide equipment and materials and do work necessary and construct or provide the following as indicated on the Drawings and as specified. Work shall include but shall not be limited to Baseball Equipment:
1. Pole to Pole Tension Netting System
 2. Batting Tunnel Cage Netting System
 3. Foul Ball Poles
 4. Bases, Pitching Rubber, Home Plate
 5. Bullpen Two Tier Benches
 6. Portable Player Benches
 7. Dugout Guard Rail System
 8. Dugout Guard Rail Padding
 9. Chain Link Fence Padding
 10. Chain Link Fence Top Rail Guard
 11. Chain Link Fence Top Rail Padding
 12. Wall Padding

1.2 SUBMITTALS

- A. Shop Drawings:
1. Show application to project.
 2. Show fabrication and installation of backstop assembly and foul ball poles. Include plans, elevations, component details, and attachments to other Work.
- B. Product Data: Submit manufacturer's product data and samples as noted for the following:
1. Batting Tunnel Net Fabric:
 - a. 3 samples of netting one square foot each.
 2. Pole to Pole Tension Netting System
 - a. Product cut sheet
 - b. Stamped and signed pole foundation design
 3. Foul Ball Poles:
 - a. Product cut sheet
 4. Bases, pitching rubber homeplate:
 - a. Verify quantities which may include bullpens and batting tunnels.

1.3 PERFORMANCE REQUIREMENTS

- A. Tension Netting Systems: Contractor to submit sealed shop drawings by a State Licensed Engineer for the upright post diameter and footing design.

1.4 QUALITY ASSURANCE

- A. Installer of outdoor sports equipment the playing field shall be the same Contractor. All installed equipment shall be under the supervision of Owner's groundskeeper.

- B. Inline Ball Net System Installer: Contractor to restretch/tighten netting if necessary 60 days after substantial completion.
- C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel," and AWS D1.3, "Structural Welding Code – Sheet Steel."

1.5 WARRANTY

- A. General Warranty: Special warranties specified in this Section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranties:
 - 1. Equipment: Written warranties, executed by the manufacturer of each piece of equipment specified agreeing to repair or replace equipment or components that fail in materials or workmanship with specified warranty period.
 - 2. Backstop Netting: Installed netting shall prevent passage of batted or thrown ball. If netting fails to do so, installer shall adjust netting to appropriate tension.
 - a. Warranty Period: 3 years from Date of Substantial Completion.

PART 2 – PRODUCTS

2.1 BASEBALL EQUIPMENT

- A. Pole to Pole Tension Netting System Upright Support Posts and Pole Structures - Fabricated, Sized and Configured as Required:
 - 1. Height above finish grade as required per plan
 - 2. Super durable powder coated black finish with enhanced resistance to UV and fade
 - 3. Ground sleeve embedment mount
 - 4. Hot dipped galvanized assembly hardware - quantities, sizes and configurations as required.
- B. Pole to Pole Tension Netting System Wire Rope Support Structure:
 - 1. Length, height and configuration as required
 - 2. 7 x 19 GAC galvanized aircraft cable - 5/16" diameter main horizontal support, 9,800 lb minimum breaking strength, 3,267 lb minimum working load limit
 - 3. 7 x 19 GAC galvanized aircraft cable - 1/4" diameter vertical and bottom horizontal supports, 7,000 lb minimum breaking strength, 2,333 lb minimum working load limit
 - 4. Hot dipped galvanized attachment and assembly.
- C. Pole to Pole Tension Netting System Net and Rope Bound Border:
 - 1. Length, height and configuration as required
 - 2. Ultra Cross Knotless Netting
 - 3. Dyneema ultra high molecular weight polyethylene SK-75 black fiber construction
 - 4. 4 ply, 1.2mm (0.0472") diameter twine
 - 5. 95% open mesh area (see through visibility)
 - 6. 58,445 psi minimum breaking strength
 - 7. 30% maximum elongation at break
 - 8. 1 3/4" square mesh, 0.009 lbs per square foot

9. 4-strand, braided, continuous monofilament dyneema fiber
 10. Black multi-filament polypropylene solid braid derby rope sewn binding on perimeter edges - 1/4" diameter, 530 lb minimum breaking strength
 11. Urethane black bonded finish
 12. Strong resistance to ultraviolet light degradation
 13. Excellent resistance to chemicals and water absorption
 14. Hot dipped galvanized attachment and assembly hardware - quantities, sizes and configurations as required
 15. Black rope for net binding attachment to wire rope support structure - quantities and configurations as required
 16. Stamped and sealed drawings and calculations by a licensed professional engineer in the state of the project location
 17. Model specific hardware kit and installation instructions.
- D. Supplier:
1. Sportsfield Specialties.
 2. Or Approved Equal.
- E. Batting Tunnels:
1. Overhead Batting Tunnel:
 - a. Quantity: 2 (1st base side - base bid; 3rd base side- Alternate GC-1)
 - b. Standard black powder coated finish
 - c. 4" O.D. x 1/8" wall aluminum tube uprights
 - d. 30" ground sleeves
 - e. 13' height x 14' wide batting tunnel net with 17' - 1 1/2" pole to pole spacing width
 - f. #36 black nylon 1 3/4" square mesh net
 - g. Black vinyl enclosed weighted 1/4" galvanized chain bottom
 - h. Two 4' wide x 13' height openings with curtain style exterior overlap flaps per tunnel
 - i. Products:
 - 1) BTOBD - Baseball Double Overhead Batting Tunnel
 - j. Supplier:
 - 1) Sportsfield Specialties, Inc., www.sportsfieldspecialties.com.
 - 2) Or approved equal.
- F. Baseball Foul Ball Poles:
1. Provide the following:
 - a. Poles: Heavy-wall 6 5/8-inch OD aluminum pipe, 40 feet high above ground for baseball.
 - b. Panel (Baseball): 1/8" stamped aluminum with double reinforced bends, 18 inches wide by 32 feet high (for 8' high outfield fence).
 - c. Finish: Electrostatically powder coated optical yellow.
 - d. Product:
 - 1) Baseball - FPW640 (Sportsfield Specialties)
 - 2) Or approved equal.
 - e. Supplier:
 - 1) Sportsfield Specialties.
 - 2) C and H Baseball (941) 727-1533, www.chbaseball.com.
 - 3) Mid America Sports Advantage, (800) 264-4519, www.masa.com.

4) Or approved equal.

G. Bases, Plates and Rubbers:

1. Acceptable Products:

a. Bases:

- 1) Quantity: 3
- 2) Hollywood Original Jack Corbett Bases with anchors and plugs
- 3) Or approved equal.

b. Homeplate:

- 1) Quantity: 1
- 2) Schutt Pro Baseball Home Plate
- 3) Stanchion mounted steel plate.

c. Removable Pitching Rubber:

- 1) Quantity: 5
- 2) Regulation Hollywood 6" x 24" Pitching Rubber and Dual Stanchion Ground Anchor
- 3) Or approved equal.

2. Suppliers:

- a. Beacon Ballfields, (800) 747-5985
- b. Schutt Sports, (800) 426-9784
- c. Mid America Sports Advantage (800) 264-4519, www.masa.com
- d. Partac Peat, (800) 247-BEAM.

H. Baseball Bullpen Two Tier Benches (Alternate GC-2):

1. General:

- a. Two-Tier
- b. Polyboard planking
- c. 12 feet long.

2. Quantity:

- a. 2 total (1 per baseball bullpen, located per plan)

3. Product:

- a. LG-TTPY-12.
- b. EQ7028

4. Color:

- a. Dark Gray or as approved by Owner.

5. Supplier:

- a. Sportsfield Specialties, Inc., www.sportsfieldspecialties.com
- b. On Deck Sports
- c. Or approved equal.

I. Baseball Portable Player Benches (Alternate GC-2):

1. General:

- a. 7 feet 6 inches long bench with backrest
- b. Portable

2. Quantity:

- a. 4 total (2 per baseball bullpen, located per plan)

3. Product:
 - a. 7'-6" long portable player bench
 4. Color:
 - a. Approved by Owner.
 5. Supplier:
 - a. AAE
 - b. On Deck Sports
 - c. Or approved equal.
- J. Dugout Guard Rail System:
1. Top rail, bottom rail and vertical posts:
 - a. Modularized steel structure
 - b. Constructed using 2" square x 11 ga. Tubing, black powder coated
 - c. 42" height for baseball by length as shown on drawings
 - d. Individual rail sections shall be equally spaced
 - e. 7" square x 3/8" thick base plates with 3/8" x 5" concrete wedge anchors
 - f. Ultra Cross knotless black dyneema netting, 1 3/4" square mesh
 - g. Flat padding
 - h. Product:
 - 1) GRS42 – Baseball Guard Rail System
 - i. Supplier:
 - 1) Sportsfield Specialties, Inc. www.sportsfieldspecialties.com
 - 2) Or approved equal.
- K. Dugout Guard Rail Padding:
1. Top rail, bottom rail and posts:
 - a. General: 42" height (baseball) square style rail and post padding. 1 1/4" thick closed cell cross link foam, Grommets, hems, 18-ounce outdoor vinyl, High UV, standard color as selected by Owner.
 - b. 3/4" square edge water resistant composite sheathing panel, all sides stained and sealed with exterior grade finish
 - c. Padding attached to rail with provided corrosion resistant brackets and fasteners
 - d. Custom digital graphics
 - e. Product: BSGRPDG Squared Guard Rail Padding with Custom Digital Graphics, 48" high (baseball). Custom Graphics, logos and lettering to be confirmed by Owner.
 - f. Color:
 - 1) By Owner
 - g. Supplier:
 - 1) Sportsfield Specialties, Inc., www.sportsfieldspecialties.com
 - 2) Or approved equal.
- L. Chain Link Fence Top Rail Guard:
1. Top Rail:
 - a. General: Rounded teardrop shape HDPE top rail guard with predrilled holes at 24" intervals for securing with zip ties. Premium 0.10" wall thickness with 5 year warranty.
 - b. Product: Premium Fence Guard
 - c. Color:
 - 1) Baseball outfield and sideline fence: Standard manufacturer's color by owner

- d. Supplier:
 - 1) Douglas Sports
 - 2) Or approved equal.
- M. Chain Link Fence Top Rail Padding (Alternate GC-5):
- 1. Top Rail:
 - a. General: Squared style top rail padding with sewn grommet. 1 1/4" thick high impact closed cell cross link foam. Two (2), 1.5" wide vinyl flaps with #2 stainless steel grommets every 6". 18-ounce vinyl, High UV, standard color as selected by Owner, 14" long, 50 lb break strength UV resistant black cable zip ties to attach to top rail.
 - b. Product: BSGRPSG Guard Rail Padding with Sewn Grommet
 - c. Color:
 - 1) Baseball outfield and sideline fence: Standard manufacturer's color by owner
 - d. Supplier:
 - 1) Sportsfield Specialties, Inc., www.sportsfieldspecialties.com
 - 2) Or approved equal.
- N. Wall Padding:
- 1. Wall Safety Pads: Padded wall panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with visible surfaces fully covered by seamless fabric covering, free of sag and wrinkles and firmly attached to back of backer board.
 - a. Basis of design: EnviroZone Field Wall Protective Padding, 48" high at backstop and 72" high at back of bullpen per plans.
 - b. 2" thick recyclable thermoplastic, Expanded Bead Polyethylene (EPE) Closed Cell
 - c. 3/4" Square Edge water resistant sheathing panel, all sides stained and sealed with exterior grade finish. Exposed sheathing surface is to be painted to match vinyl color when exposed to view.
 - d. 25 oz. per square yard extruded vinyl manufactured using 33% reprocessed vinyl, high UV resistance and five (5) year fade warranty.
 - e. Fabric: 1000 denier polyester fabric
 - f. Tear Strength Test: Warp 78 lbs., Fill 65 lbs
 - g. Tensile Strength: Warp 224 lbs., Fill 220 lbs
 - h. Weft Insertion: 9 x 9, Superior UV Inhibitors
 - i. Cold Crack: Minus 20° Fahrenheit
 - j. Vinyl seams double stitched using 6 lb. bonded polyester black thread
 - k. Stainless steel Z-Clip assembly hardware
 - l. Powder coated bolt and plate chain link mounting system
 - m. Meets and/or Exceeds ASTM International F2440-11 Standard Specification for Indoor Wall/Feature Padding with a G-Max Rating of Less Than 100
 - n. Color: Standard color padding with custom graphics and lettering included
 - o. Five (5) Year Limited Product Warranty.
 - 2. Suppliers:
 - a. Sportsfield Specialties, Inc., www.sportsfieldspecialties.com
 - b. Or approved equal.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General: Install in accordance with manufacturers recommendations and approved shop drawings.
- B. Baseball Equipment:
 - 1. Batting Tunnel/Cage Netting:
 - a. Fasten netting system to upper frame, support cables and ground surface.
 - 1) Netting to be fastened so that it is a minimum of 18 inches clear from all vertical posts. Do not attach netting to rigid vertical pipe supports.
 - b. Install system and hardware per manufacturer's recommendations.
 - c. Contractor to return after 60 days to retighten netting as required.
 - 2. Foul Ball Poles and Appurtenances:
 - a. Install as recommended by the manufacturer or as shown on the Drawings.
 - b. The Contractor shall verify and install homeplate so that the back corner of the plate is at a 90-degree angle and lined up on the outside edge of the foul ball pole. This location shall be verified by the Contractor at the beginning of playing field construction.
 - 3. Bases, Plates and Rubbers:
 - a. Install pitcher's plates, full depth homeplates, and bases as per the manufacturer's instructions.
 - b. These operations to be done under the observance of the Team or Owner's Head Groundskeeper.
 - 4. All field wall protective padding and accessories shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings.

3.2 CLEANING

- A. After completing equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
- B. Replace equipment and finishes that cannot be cleaned and repaired, in a manner approved by Engineer, before time of Substantial Completion.

END OF SECTION

SECTION 260001 – ELECTRICAL

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Provide all labor, material, tools, equipment, transportation, and services necessary for and incidental to completion of all electrical work as indicated on the Drawings and/or as specified herein.

1.2 DRAWING USE AND INTERPRETATION

- A. The Drawings are diagrammatic and indicate the general arrangement of systems and equipment unless indicated otherwise by dimensions or details. Exact equipment locations and raceway routing, etc. shall be governed by actual field conditions and/or instructions of the Engineer and/or Owner's Representative.

1.3 COMPLETE SYSTEMS

- A. General: Furnish and install all materials as required for complete systems, including all parts obviously or reasonably incidental to a complete installation, whether specifically indicated or not. All systems shall be completely assembled, tested, adjusted and demonstrated to be ready for operation prior to Owner's acceptance.
- B. Wiring: The wiring specified and/or shown on the Drawings is for complete and workable systems. Any deviations from the wiring shown due to a particular manufacturer's or subcontractor's requirements shall be made at no cost to either the Contract or the Owner.

1.4 CODES AND REGULATIONS

- A. General: Comply with the latest recognized edition of the National Electrical Code (NEC) and all governing federal, state, and local laws, ordinances, codes, rules, and regulations. Where the Contract Documents exceed these requirements, the Contract Documents shall govern. In no case shall work be installed contrary to or below minimum legal standards.
- B. Utilities: Comply with all applicable rules, restrictions, and requirements of the utility companies serving the project site/facilities.
- C. Non-Compliance: Should any work be performed which is found not to comply with any of the above codes and regulations, provide all work and pay all costs necessary to correct the deficiencies.

1.5 REFERENCE STANDARDS

- A. All latest published standards of the following associations/organizations shall be followed and applied where applicable as minimum requirements:
 1. (ADA), Americans with Disabilities Act.
 2. (ANSI), American National Standards Institute.
 3. (ASTM), American Society for Testing and Materials.
 4. (BCNYS), Building Code of New York State.
 5. (CBM), Certified Ballast Manufacturer.
 6. (EPACT), National Energy Policy Act.
 7. (ETL), Electrical Testing Laboratory.

8. (FCNYS), Fire Code of New York State.
9. (ICEA), Insulated Cable Engineers Association.
10. (IEEE), Institute of Electrical and Electronic Engineers.
11. (IESNA), Illuminating Engineering Society of North America.
12. (NBFU), National Board of Fire Underwriters.
13. (NEMA), National Electrical Manufacturers Association.
14. (NESC), National Electrical Safety Code.
15. (NFPA), National Fire Protection Association.
16. (UL), Underwriter's Laboratories.

1.6 PERMITS

- A. General: Obtain and pay for any and all permits required by all applicable agencies, prior to commencing work.

1.7 SUBMITTALS

- A. General: Prepare and submit for approval, per the procedures set forth in Division 1, all submittals required by Division 1, this section, and by all other Contract Documents.
- B. Types: Required submittals may include: Schedule of Values; List of Subcontractors; Product Data; Shop Drawings; Samples; Test Reports; Certifications; Warranties; Maintenance Manuals; Record Drawings; and various administrative submittals.
- C. Number of Copies: As indicated in Division 1, Division 26, or elsewhere in the Contract Documents. For quantities indicated in the Contract Documents or specification sections other than Division 26 sections, increase number of copies by one to allow for the Engineer's record copy. Minimum number of copies per submittal: three.
- D. Product Data: Submit for all basic electrical equipment, devices, and materials to be used on the project. Product data to consist of manufacturer's standard catalog cuts, descriptive literature and/or diagrams, in 8-1/2-inch-by-11-inch format, and in sufficient detail so as to clearly indicate compliance with all specified requirements and standards. Mark each copy to clearly indicate proposed product, options, finishes, etc.
- E. Shop Drawings: Submit for all custom equipment and systems (e.g., panelboards) to be used on the project. Shop Drawings to be newly prepared, specifically for this project, and shall include all information listed in the Shop Drawings submittal requirements in the respective specification section. Include all pertinent information such as equipment/system identification, manufacturer, dimensions, nameplate data, sizes, capacities, types, materials, performance data, features, accessories, wiring diagrams, etc., in sufficient detail so as to clearly indicate compliance with all specified requirements and standards. For control systems, provide computer generated control ladder diagrams specifically developed for this project (standard diagrams not acceptable).
- F. Maintenance Manuals: Include operating and maintenance data in accordance with Division 1. Include all Product Data/Shop Drawing submittals as well as descriptions of function, normal operating characteristics and limitations, and manufacturer's printed operating maintenance, trouble shooting, repair, adjustment, and emergency instructions, and complete replacement parts listing.
- G. Record Documents: Prepare and submit in accordance with Division 1. In addition to Division 1 requirements, indicate actual installed locations for all equipment and devices, routing of major interior raceways, locations of all concealed and underground equipment and raceways, and all

approved modifications to the Contract Documents, and deviations necessitated by field conditions and change orders.

1.8 QUALITY ASSURANCE

- A. Manufacturers' Qualifications: Not less than three years of experience in the actual production of the specified products.
- B. Installers' Qualifications: Firm with not less than five years of experience in the installation of electrical systems and equipment similar in scope and complexity to those required for this Project, and having successfully completed at least ten comparable scale projects.
- C. Incidental Work: Excavation, backfill, painting, patching, welding, carpentry, mechanical work, concrete pads and the like related to or required for Division 26 work shall be performed by craftsman skilled in the appropriate trade, but shall be provided for under Division 26.

1.9 INSPECTIONS

- A. General: During and upon completion of the work, arrange and pay all associated costs for inspections of all electrical work installed under this contract, in accordance with the Conditions of the Contract.
- B. Inspections Required: As per the laws and regulations of the local and/or state agencies having jurisdiction at the project site.
- C. Inspection Agency: Approved by the local and/or state agencies having jurisdiction at the project site.
- D. Certificates: Submit all required inspection certificates.
- E. Coordination: Coordinate inspections with the local utility.

1.10 DELIVERY STORAGE AND HANDLING

- A. Comply with Division 1 requirements.
- B. Packing and Shipping: Deliver products in original, unopened packaging, properly identified with manufacturer's identification, and compliance labels.
- C. Storage and Protection: Comply with all manufacturer's written recommendations. Store all products in a manner, which shall protect them from damage, weather, and entry of debris.
- D. Damaged Products: Do not install damaged products. Arrange for prompt replacement.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Where Specified: Materials and equipment shall be as specified herein and/or as indicated on the Drawings.
- B. General Requirements: All materials and equipment shall be in accordance with the Contract Documents, and to the extent possible, standard products of the various manufacturers, except where

special construction or performance features are called for. All materials and equipment to be new, clean, undamaged, and free of defects and corrosion.

- C. Acceptable Products: The product of a specified or approved manufacturer will be acceptable only when that product complies with or is modified as necessary to comply with all requirements of the Contract Documents.
- D. Common Items: Where more than one of any specific item is required, all shall be of the same type and manufacturer.
- E. UL Listing: All electrical materials and equipment shall be Underwriters' Laboratories (UL) listed and labeled where UL standards and listings exist for such materials or equipment.

2.2 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Refer to the Conditions of the Contract and Division 1.

2.3 FIRESTOPPING MATERIALS

- A. General: Firestop systems composed of firestop compounds and appropriate damming materials installed together with the penetrant (e.g., conduit) to form a complete firestop system, providing a fire resistant rating at least equal to the hourly fire resistance rating of the floor, wall or partition into which the firestop system is to be installed.
- B. Test Standards: Firestopping materials shall be tested together as a system to the time/temperature requirements of ASTM E119 and shall be tested to UL 1479 (ASTM E814) and be UL classified listed for up to 3 hours.
- C. Firestop Sealants: Non-hardening, conformable, intumescent putties, sealants or other compounds, containing no toxic solvents or asbestos, and exhibiting aggressive adhesion to all common building materials and penetrants, while allowing reasonable movement of the penetrants, without being displaced. Compounds shall be waterproof, non-toxic and smoke and gas tight.
- D. Firestop Mortars: Light-weight, water-based, cementitious, fast drying, low density mortar, non-shrinking and non-cracking during its cure, and which forms a surface capable of being sanded, bored and painted.
- E. Damming Materials: Mineral wool or ceramic fiber.
- F. Multi-Cable Transits: Assemblies consisting of a frame, a compression mechanism, and grooved insert sealing modules sized for multiple penetrating elements of various sizes.
- G. Acceptable Manufacturers: Hilti; Heavy Duty/Nelson; International Protective Coatings; Specified Technologies, Inc.

2.4 SOIL MATERIALS

- A. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, or natural or crushed sand.
- B. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2-inch sieve and not more than 5 percent passing a No. 4 sieve.

- C. Backfill and Fill Materials: Materials complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP, free of clay, rock, or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetable, and other deleterious matter.

2.5 CONCRETE WORK

- A. Concrete:
 - 1. Minimum Strength: 3000 psi at 28 days.
 - 2. Aggregate: 3/4 inch aggregate.
 - 3. Cement: 588 #/cubic yard minimum, Type I or II.
 - 4. Slump: 4 inches maximum.
 - 5. Air: 5 to 7 percent.
- B. Reinforcing: Grade 60 bars, sized as indicated, and 6 inches by 6 inches – W1.4 by W1.4 mesh and other reinforcing as indicated.
- C. Forms: Wood, metal, or other approved materials constructed so as to withstand the forces of the newly placed concrete.
- D. Equipment Pads: Minimum 4 inches thick indoor, 12 inches thick outdoor (with 9 inches below grade), with 1 inch by 45-degree chamfer on all top edges. For on grade installations, provide 12-inch layer of crushed stone beneath pad. For pads to be placed on concrete floors, provide anchors into concrete floor.
 - 1. Comply with equipment manufacturer's specifications and/or utility company requirements.

2.6 RACEWAY SYSTEMS

- A. Raceway Sizing: As required by the NEC (minimum) with oversized raceways as indicated and where required for ease of pulling cable.
 - 1. Minimum conduit size: 3/4 inch, unless indicated otherwise.
- B. Raceway Types: Rigid galvanized steel conduit, electrical metallic tubing (EMT), flexible steel conduit, liquid-tight flexible steel conduit and Schedule 40 heavywall and Schedule 80 extra-heavywall rigid non-metallic (PVC) conduit conforming to applicable ANSI, NEMA and UL standards.
- C. Fittings: All raceway fittings (except for rigid non-metallic conduit) to be steel or malleable iron and UL-listed for the intended application. EMT fittings to be compression type.
- D. Outlet Boxes (Concealed in Walls): Non-gangable, galvanized steel with square cornered tile (or masonry) type extension rings or cover.
 - 1. Minimum size: two-gang masonry box or 4-inch square box with single-gang adapter (plaster) ring. Depth of adapter ring to suit application.
 - 2. Minimum depth: 1-1/2 inches.
 - 3. Minimum capacity: 21 cubic inches.
- E. Outlet Boxes (Surface Mounted): Cadmium plated cast or malleable iron.
- F. Pull and Junction Boxes, and Wireways: Use as indicated and required. Junction and pull boxes for general indoor use (dry locations) to be of galvanized code gauge steel construction, minimum 4-inch square by 1-1/2 inches deep with screw-on covers. Wireways to be UL listed, sheet steel

construction with screw-on covers. For exterior and damp or wet indoor locations, use boxes and wireways approved for such use.

- G. Handholes: Light-weight and high-strength, constructed of fiberglass reinforced polymer concrete, gray color, suitable for use at temperatures down to -50 DegF, and resistant to sunlight, weathering, chemicals and freeze-thaw cycles, with bolt-on cover (with standard logo indicating type of service), and designed for in-grade use in areas with light vehicular traffic (5,000-pound load over a 10-inch by 10-inch area).
 - 1. Acceptable Manufacturers:
 - a. Quazite "Composolite."
 - b. Styles "PC" or "PG."
- H. Pipe Sleeves: Rigid steel conduit or iron pipe.
- I. Conduit Seals: For Cast-in-Place Concrete Applications:
 - 1. Acceptable Manufacturers:
 - a. O-Z/Gedney Type "FSK."
 - b. Thunderline Corp. "Link Seal" with "Link Seal Wall Sleeve."
- J. For Core Drilled and Pre-Cast Opening Applications:
 - 1. Acceptable Manufacturers:
 - a. O-Z/Gedney Type "CSML."
 - b. Thunderline Corp. "Link Seal."
- K. Pull Wires: No. 14 AWG zinc-coated steel monofilament plastic line with 200-pound tensile strength.

2.7 600 VOLT CLASS WIRE

- A. General: All wire and cable shall be constructed in accordance with all applicable ICEA, NEMA and IEEE published standards, and shall be UL-listed and labeled. Single-conductor, 98 percent conductivity, annealed, uncoated copper conductors with 600-volt rated type "THHN/THWN" insulation.
- B. Wire shall be annealed bare copper per ANSI/ASTM B3, UL 83, and Federal Specification JC-30A with 600 volt insulation, be stranded (except for #10 AWG and smaller may be solid), and be minimum size #12 AWG (except for control wiring and signal circuits).
- C. Insulation: Provide THHN/THWN insulation for all conductors except XHHW insulation may be used for conductors #4 and larger.
- D. Ampacity of conductors shall be rated for 75 DegC regardless of temperature of conductor insulation when combining circuits in one conduit. Derate conductors and increase size per NEC when installing multiple circuits in a raceway, utilizing 75 DegC ampacity table.
- E. Connectors: Nylon shell insulated metallic screw-on connectors for #14-10 AWG and bolted pressure or compression type lugs and connectors with insulating covers for #8 AWG and larger.

2.8 WIRING DEVICES

- A. GFI Receptacles: Ground fault circuit interrupter, feed-through, duplex type, 125 volt, 20 amp, NEMA 5-20R, with solid-state ground-fault sensing and 5 mA trip level.

1. Acceptable Manufacturers:
 - a. Leviton.
 - b. Arrow-Hart.
 - c. Hubbell.
 - d. Pass and Seymour.
- B. Device Color: white, unless directed otherwise.
- C. Coverplates (Exterior Locations): Weatherproof cast aluminum . Receptacles installed in damp or wet locations shall have an enclosure and cover that are weatherproof with the attachment plug inserted or removed per NEC 406.9.

2.9 EQUIPMENT CONNECTIONS

- A. Materials as specified in this section, and as required.

2.10 HANGERS AND SUPPORTS

- A. General: All hangers, supports, fasteners and hardware shall be zinc-coated or of equivalent corrosion resistance by treatment or inherent property, and shall be manufactured products designed for the application. Products for outdoor use shall be hot dip galvanized.
- B. Types: Hangers, straps, riser supports, clamps, U-channel, threaded rods, etc., as indicated and/or required.
- C. Seismic restraints and supports as indicated and/or required.

2.11 ELECTRICAL IDENTIFICATION

- A. Nameplates: Three-layer laminated plastic with minimum 3/16-inch high white engraved characters on black background, and punched for mechanical fastening. Fasteners: self-tapping stainless-steel screws or number 10-32 stainless steel machine screws with nuts and flat and lock washers. Each nameplate on all panelboards and switchgear shall indicate the following:
 1. Panel Name.
 2. Voltage, Phase, Number of Wires.
 3. Source.
- B. Underground Warning Tape: 6-inch wide polyethylene tape, permanently bright colored with continuous-printed legend indicating general type of underground line below and "CAUTION." Colors as follows:
 1. Red – Electric.
 2. Orange – Communications.
- C. Marking Pens: Permanent, waterproof, quick drying black ink.
 1. Acceptable Manufacturers:
 - a. Sanford Fine Point "Sharpie."
 - b. Or equal.
- D. Wire Tags: Vinyl or vinyl-cloth self-adhesive wraparound type indicating appropriate circuit number, etc.
- E. Arc Flash Panelboard Stickers: Provide per NEC 110.16.

2.12 ELECTRIC SERVICE

- A. Materials as specified elsewhere in this section and as required by the serving electric utility company.

2.13 GROUNDING

- A. General: Ground rods, conductors, clamps and connectors, etc., as required.
- B. Ground Rods: Minimum 5/8-inch diameter by 10-foot long copper clad steel.
- C. Welded Connectors: Exothermic process.

2.14

2.14 PANELBOARDS

- A. Types: Two-row, bolt-on circuit breaker branch circuit panelboards, and circuit breaker or fusible switch-type distribution panelboards, as indicated or required.
- B. General: Ratings, mains, mounting and complement of branch overcurrent protective devices as indicated below or on the Drawings.
- C. Short Circuit Ratings: Minimum 10,000 amps for 208/120 volt panelboards and 14,000 amps for 480/277 volt panelboards. Provide panelboards with higher ratings as indicated or as required.
- D. Enclosures: NEMA-1 for dry locations and NEMA 3R for wet locations (unless indicated otherwise). Provide galvanized steel rough-in box and cover with gray enamel finish Panel fronts are to have a door (circuit breakers) in door (circuit breakers & wiring gutters) in trim with concealed hinges and flush type tumbler lock. All panels shall be keyed alike. Doors in excess of 48 inches high shall be equipped with a three-point catch and vault handle with integral tumbler lock. Panel shall be dead front, safety type and be multi-section as noted or as necessary to comply with NEC.
- E. Bussing: Full capacity copper, include solid copper ground bus, bonded to enclosure and solid copper neutral bus with lug for each branch circuit
- F. Fusible Switches: Quick-make, quick-break, horsepower rated with rejection fuse clips, padlockable handle, and hinged door with defeatable interlock.
- G. Acceptable Manufacturers:
 - 1. General Electric "A Series" and "Spectra Series."
 - 2. Square D "NQOD," "NEHB," "I-Line," and "QMB."
 - 3. Cutler-Hammer "Pow-R-Line C."
- H. Panelboard Schedules: Refer to the schedules on the Drawings.

2.15 CIRCUIT BREAKERS

- A. General: Molded case with thermal and magnetic trips unless indicated otherwise. Minimum 10,000 amps interrupting capacity for 208V and 240V, 14,000 amps interrupting capacity for 480V and higher ratings as indicated or required.
- B. For Panelboard Mounting: Bolt-on type.

- C. Individually Mounted: NEMA-1 enclosures for indoor application, NEMA-3R for outdoor application, unless indicated otherwise.
- D. Breakers to be added to Existing Panelboards: Same manufacturer, type, and interrupting rating as for the existing breakers in same panelboard.

2.16 LIGHTING FIXTURES

- A. General:
 - 1. Fixture types as described below or indicated on the Drawings. Lighting fixture manufacturers' series or catalog numbers listed indicate general quality, type, and style but may not cover all required design features and details. Provide lighting fixtures having all features, details, and accessories as noted in the fixture descriptions. Provide all fittings, hangers, clamps, brackets, yokes, flanges, and miscellaneous devices required for a complete installation.
 - 2. Whenever possible, (based upon design requirements) provide lighting fixtures with ballasts provided integral to fixture and prewired.
- B. LED Lamps: Minimum 40,000 hours lamp life before 20 percent loss of output, 3500°K interior, 4500°K site and parking lot lighting unless indicate otherwise.
 - 1. Acceptable Manufacturers:
 - a. Philips.
 - b. Cree.
 - c. Luxeon.
 - d. OSRAM.

2.17 LIGHTING CONTROL EQUIPMENT

- A. Lighting Control Relays: 277 VAC (all loads), 20 amp, 6-pole (N.O.), magnetically held, 120-volt coil, with "Hand-Off Auto" selector switch, green push-to-test/transformer type interlocked pilot light and NEMA-1 enclosure with engraved nameplate "LIGHTING CONTROL RELAY."
 - 1. Acceptable Manufacturers:
 - a. Square D Class 8903, Type "L."
 - b. Or equal by GE, Cutler-Hammer, or Siemens.
- B. Photoswitches: Raintight, 120 volt or 277 volt as indicated or required with SPST contacts rated for 2000 watts with field adjustable light level sensitivity (1-15 FC) and time delay.
 - 1. Acceptable Manufacturers:
 - a. Tork #2100 Series.
 - b. Or approved equal.
- C. Time Switches: Two-channel, programmable, astronomic, seven-day digital time switch with 365-day, holiday capability (16 single dates and 5 holiday blocks), and capable of 48 events per channel, per week. Unit to include automatic adjustment for daylight savings switchovers and leap years corrections, manual on-off override control for each channel, 72-hour battery backup, and NEMA-1 metal enclosure. Astronomic feature to be field adjustable for 10- to 60-degree Northern or Southern latitudes, and selectable to one or both channels, with adjustable 1-99 minute offset from sunrise or sunset. Time switches to be suitable for operation from a 120- or 277-volt power source as indicated or required. Contacts to be rated 10 amp resistive, 7.5 amp inductive and 1/3 horsepower at 120 VAC and 10 amp resistive at 277 VAC.
 - 1. Acceptable Manufacturers:
 - a. Tork #DZS200A Series.

- b. Or equal by Paragon or Intermatic.

PART 3 – EXECUTION

3.1 GENERAL

- A. The installation of all electrical work shall be in accordance with the intent of the Contract Documents as determined by the Engineer.
- B. Installation Requirements: All materials and equipment shall be installed as recommended by the respective manufacturers, by mechanics experienced and skilled in their particular trade, in a neat and workmanlike manner, in accordance with the standards of the trade, and so as not to void any warranty or UL listing.
- C. Administration and Supervision: All electrical work shall be performed under the Contractor's direct supervision using sufficient and qualified personnel as necessary to complete the work in accordance with the progress schedule. The Contractor shall assign one or more competent supervisors who shall have authority to accept and execute orders and instructions, and who shall cooperate with the other Contractors and subcontractors, the Engineer, and Owner in all matters to resolve conflicts and avoid delays.

3.2 EXAMINATION

- A. Conditions Verification: Examine the areas and conditions under which the work is to be performed, and identify any conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.3 COORDINATION

- A. General: Sequence, coordinate and integrate the installation of all electrical materials and equipment for efficient flow of work, in conjunction with the other trades. Review to the Drawings for work of the other trades, and report and resolve any discovered discrepancies, prior to commencing work.
- B. Cooperation: Cooperate with the other Contractors and individual disciplines for placement, anchorage, and accomplishment of the work. Resolve interferences between work of other disciplines or Contractors, prior to commencing installation.
- C. Chases, Slots, and Openings: Arrange for chases, slots, and openings during the progress of construction as required to allow for installation of the electrical work.
- D. Supports and Sleeves: Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components as they are constructed.
- E. Obstacles and Interferences: When installing equipment and raceways, provide offsets, fittings, accessories, and changes in elevation or location as necessary to avoid obstacles and interferences, per actual field conditions.
- F. Space Requirements: Electrical equipment sizes indicated on the Drawings are generally based on specified manufacturer. Verify that the proposed equipment will fit in the space indicated on the drawings. Maintain clearances required by NEC.

3.4 DIMENSIONS

- A. Building Dimensions: For exact locations of building elements, refer to dimensioned drawings. However, field measurements take precedence over dimensioned drawings.
- B. Site Dimensions: Field measurements take precedence over scaled electrical site plans.
- C. Limiting Dimensions: Equipment outlines shown on detail drawings of 1/4" = 1'-0" scale or larger and dimensions indicated on the Drawings are limiting dimensions. Do not install equipment exceeding dimensions indicated by outlines on Drawings or equipment or arrangements that reduce indicated clearances.
- D. Establish the exact location of electrical equipment based on the actual field verified dimensions of equipment furnished.

3.5 EQUIPMENT PROTECTION

- A. Protect all electrical equipment, and materials and work from the weather elements, paint, mortar, construction debris and damage until project is substantially complete. Repair, replace, and clean all electrical work so affected.

3.6 ELECTRICAL INSTALLATION - GENERAL

- A. Unfinished and Finished Areas: For the purposes of these electrical specifications, "unfinished" areas shall include mechanical, electrical and telephone equipment rooms. All other areas shall be considered "finished" spaces unless indicated or approved otherwise.
- B. In Unfinished Areas: Raceways, equipment, and devices may be installed concealed or exposed unless indicated otherwise.
- C. In Finished Areas: Conceal all raceway and flush mount all electrical boxes, equipment, and devices unless indicated or approved otherwise. The space above suspended ceilings or behind furred spaces is considered outside finished areas and electrical materials installed within these areas are considered concealed.
- D. Minimum Mounting Height: Install exposed raceway and all other electrical equipment (e.g., lighting fixtures) with not less than 7 feet and 6 inches clear to finished floor unless indicated or approved otherwise, and excluding raceway and equipment mounted on walls.
- E. Dimensions and Clearances: Field measure all dimensions and clearances affecting the installation of electrical work in relation to established datum, building openings and clearances, and work of other trades as construction progresses.
- F. Rough-In Locations: Verify final locations for rough-ins with field measurements and requirements of actual equipment being installed.
- G. Door Swings: Verify the swings of all doors before switch outlets or other electrical devices are installed. If necessary, relocate devices so they are not obstructed by doors when doors are open.
- H. Ceiling Mounted Devices: The locations indicated on the architectural reflected ceiling plans take precedence over the electrical documents, in the event of conflict.
- I. Install equipment according to manufacturer's written instructions.

- J. Install equipment, conduit, cable tray, hangers, and supports to withstand seismic forces for the seismic zone of the installation.

3.7 LAYOUT

- A. General: Install electrical systems, materials and equipment level and plumb, and parallel and perpendicular to other building systems and components, where installed exposed.
- B. Serviceability: Install electrical equipment and raceways, etc., to readily facilitate servicing, maintenance, and repair or replacement of components and so as to minimize interference with other equipment and installations.
- C. Clearances: Prior to commencing work, verify that all electrical equipment will adequately fit and conform to the indicated and code required clearances in the spaces indicated on the Drawings. If rearrangement is required, submit plan and elevation drawings or sketches indicating proposed rearrangement for the Engineer's approval. Do not rearrange without express written permission of the Engineer.
- D. Right-Of-Way: When laying out electrical work, give priority in available space to steam and condensate lines, sanitary lines, drain lines, fire protection piping, and sheet metal duct work. Provide offsets as required to avoid conflicts. Resolve all conflicts before commencing installation.

3.8 MOUNTING HEIGHTS

- A. General: Indicated heights are measured from the center of the device outlet box to finished floor or grade, unless indicated otherwise. Request instructions for mounting heights not indicated.

3.9 HOLES, SLEEVES, AND OPENINGS

- A. General: Provide all holes, sleeves, and openings required for the completion of Division 26 work and restore all surfaces damaged to match surrounding surfaces. Maintain integrity of all fire and smoke rated barriers using approved firestopping systems. When cutting holes or openings, or installing sleeves, do not cut, damage, or disturb structural elements or reinforcing steel unless approved in writing by the Project Structural Engineer.
- B. Conduit Penetrations: Size core drilled holes so that an annular space of not less than 1/4 inch and not more than 1 inch is left around the conduit. When openings are cut in lieu of core drilled, provide sleeve in rough opening. Size sleeves to provide an annular space of not less than 1/4 inch and not more than 1 inch around the conduit. Patch around sleeve to match surrounding surfaces.

3.10 FIRESTOPPING SYSTEMS

- A. General: Install firestopping at all electrical raceway and cable penetrations through floor structures and interior walls or partitions, which are time-rated fire and/or smoke barriers.
- B. Preparation: Prior to installation, verify that all penetrating elements and supporting devices are permanently installed and that surfaces which will be in contact with penetration seal materials are clean and free of dust, dirt, grease, oil, loose materials, rust or other substances.
- C. Installation: Install firestop systems in accordance with UL approved design details and the manufacturer's instructions. Install sleeves, conduits, and cables with required clearance spaces, allowing installation of sealing materials. Do not exceed the outside diameter of the sleeve, conduit, or cable by more than 1 inch or by less than 1/4 inch when making openings for penetrations. Install firestop systems so as to completely seal openings to prevent passage of smoke and water.

3.11 CUTTING AND PATCHING

- A. General: Provide all cutting, drilling, chasing, fitting, and patching necessary for accomplishing the work of Division 26, which includes any and all work necessary to: uncover work to provide for the installation of ill-timed work; remove and replace defective work and work not conforming to the requirements of the Contract Documents; and install equipment and materials in existing structures, in addition to that required during the normal course of construction.
- B. Comply with the cutting and patching requirements of Division 1.
- C. Building Structure: Do not endanger the integrity of the building structure by cutting, drilling, or otherwise modifying any structural member without specific approval. Do not proceed with any structural modifications without written permission of the Project Structural Engineer.
- D. Repairs: Repair any and all damage to work of other trades caused by cutting and patching operations using skilled mechanics of the trades involved.

3.12 WELDING

- A. General: Where welding is required, such welding shall be performed in a skilled manner by certified welders. Verify that welds are free from cracks, craters, undercuts, and strikes, weld spatter, and any other surface defects. Clean and re-weld any welds deemed unacceptable in size or configuration. Do not weld to structural steel without prior written permission from the Project Structural Engineer.

3.13 UNDERGROUND ELECTRICAL WORK

- A. General: Perform all excavating, trenching, backfilling, etc., as indicated or required for the installation of all underground electrical work. Coordinate work with other trades and verify existing underground services and conditions.
- B. Conduit Burial Depth: 30 inches below finished grade or 6 inches below bottom of frost line, whichever is deeper, unless indicated otherwise. All excavation and burial depths indicated are below finished grade.
- C. Excavating: Do not excavate below required depth except as necessary for removal of unstable soil or when rock is encountered. When rock is encountered, excavate 6 inches below the required depth and backfill with a minimum 6-inch layer of crushed stone or gravel between rock bearing surface and the electrical installation. Stockpile satisfactory excavated materials where directed until required for backfilling. Remove and legally dispose of excess excavated materials and materials not suitable for backfill use. Shore and brace as required for stability of excavation. Remove shoring and bracing when no longer required. Where sheeting is allowed to remain, cut top of sheeting off at an elevation of 30 inches below finished grade.
- D. Protection: Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by excavations.
- E. Existing Utilities: Remove existing electrical and other utility lines so indicated. Where existing utilities, which are to remain, exist within areas of excavation, locate such utilities and support and protect during excavation operations.
- F. Trenching: Cut all trenches neatly and uniformly and so as to provide ample working room and at least six inches clearance on both sides of raceways, etc., unless otherwise noted. Take necessary

precautions when working near existing underground utilities, and coordinate with the installation of concurrent utilities by other trades. Unless indicated otherwise, pitch all electrical conduit runs downward away from buildings, manholes, and pad mounted equipment. Excavate trenches to depth indicated or required. Limit length of open trench to that in which installations can be made and trenches backfilled within the same day.

- G. Sand Envelope: Install a minimum envelope of 3 inches (top, bottom, and sides: 3 inches each) of fine grain sand around all electrical cables and conduits installed below grade unless indicated otherwise.
- H. Preparation for Backfilling: Backfill excavations as promptly as work permits but not until completion of inspection, testing, approvals, and recording of underground utility locations. Prior to backfilling, remove all concrete form work, shoring, bracing, trash, and debris.
- I. Backfilling: Use only approved materials free from boulders, sharp objects, and other unsuitable materials. Match the final elevations and materials of areas affected by electrical excavating, trenching, and backfilling. Replace conduit and cables damaged by improper backfilling. Replace surface materials to match existing surface materials if no other utility or site work is being done in area. Place specified soil materials in 4- to 8-inch layers to required subgrade elevations for area classifications as follows:
 - 1. Under Sidewalks: Use combination of subbase materials and excavated or borrowed materials.
 - 2. Under Building Slabs: Use drainage fill materials.
 - 3. Under Piping and Equipment: Use subbase materials where required over rock bearing surfaces and for correction of unauthorized excavation.
 - 4. For Raceways Less than 30 inches below Surface of Paved Areas or Roadways: Provide 4-inch thick concrete base slab support. After raceway installation, provide 4-inch thick concrete encasement (sides and top) prior to backfilling and placement of roadway subbase. Refer to Contract Documents for Conduit Encased in Concrete Details.
- J. Backfill Placement: Place backfill and fill materials in layers of not more than 8 inches in loose depth for material compacted by heavy equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification specified below. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice. Place backfill and fill materials evenly adjacent to structures, piping, and equipment to required elevations. Prevent displacement of raceways and equipment by carrying material uniformly around them to approximately same elevation in each lift.
- K. Compaction: Control soil compaction during construction, providing minimum percentage of density specified for each area classification indicated below.
- L. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density for soils, which exhibit a well-defined, moisture-density relationship (cohesive soils), determined in accordance with ASTM D1557 and not less than the following percentages of relative density, determined in accordance with ASTM D2049, for soils, which will not exhibit a well-defined moisture-density relationship (cohesionless soils).
 - 1. Areas under Structures, Building Slabs and Steps, Pavements: Compact top 12 inches of subgrade and each layer of backfill or fill material to 90 percent maximum density for cohesive materials and 95 percent relative density for cohesionless materials.
 - 2. Areas Under Walkways: Compact top 6 inches of subgrade and each layer of backfill or fill material to 90 percent maximum density for cohesive materials and 95 percent relative density for cohesionless materials.

3. Other Areas: Compact top 6 inches of subgrade and each layer of backfill or fill material to 85 percent maximum density for cohesive materials and 90 percent relative density for cohesionless materials.
- M. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water. Apply water in minimum quantity necessary to achieve required moisture content and to prevent water appearing on surface during, or subsequent to, compaction operations.
- N. Subsidence: Where subsidence occurs at electrical installation excavations during the period 12 months after Substantial Completion, remove surface treatment (i.e., pavement, lawn, or other finish), add backfill material, compact to specified conditions, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent areas.

3.14 CONCRETE WORK

- A. General: All concrete shall be prepared from approved materials and poured on clean, stable surfaces.
- B. Exterior Base Surfaces: 12-inch layer of crushed stone over well-consolidated, stable, undisturbed soil. Where the underlying soil contains excess organic material, trash or voids, or fails to provide solid bearing for any other reason, excavate to the depth required for solid bearing and re-establish the required elevation with approved granular materials.
- C. Finishing: Trowel all exposed surfaces smooth. Round-off or chamfer all exposed edges.
- D. Curing: Beginning immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury. Maintain minimal moisture loss at relatively constant temperature throughout period necessary for hydration of cement and hardening of concrete.

3.15 ELECTRICAL DEMOLITION

- A. General: Provide electrical demolition work as indicated and as required for removal and/or abandonment of systems, equipment, devices, etc., made obsolete by this Project and as required for demolition and remodeling by the other trades.
- B. Existing Conditions: In general, existing electrical systems, equipment, and devices are not shown on the Drawings unless pertinent to the demolition and/or remodeling work. Existing electrical conditions, where indicated, are based on casual field observations and must be verified. Report any discrepancies to the Engineer before disturbing the existing installation.
- C. Examination: Prior to bidding, examine the site to determine all actual observable conditions. No additional compensation will be granted on account of extra work made necessary by the Contractor's failure to investigate such existing conditions.
- D. Scheduling and Phasing: Coordinate demolition and changeover work with the other trades involved and with the Owner's Representative.
- E. Protection of Adjacent Materials: During execution of demolition work, primary consideration shall be given to protecting from damage, the building structure, furnishings, finishes, and the like, which are not specifically indicated to be removed. Existing items or surfaces to remain, which are damaged as a result of this work, shall be refinished, repaired, or replaced to the satisfaction of the Owner at the Contractor's expense.

- F. Patching: When electrical materials are removed, patch and finish walls, surfaces, etc., to match surrounding surfaces. Provide blank coverplates as required, etc. Materials used for patching shall be in conformance with the applicable sections of the Project Manual. Where materials are not specifically described, but required for proper completion of the Work, they shall be as selected by the Contractor subject to approval of the Engineer.
- G. Inspection: Before commencing demolition work, carefully inspect the project site and become familiar with existing systems and conditions.
- H. Items To Be Salvaged: Verify with the Owner, all systems, materials, and equipment which are to be salvaged and those which must be removed. The Owner reserves the right to salvage any or all existing electrical materials and equipment at the project site.
- I. Disconnections: Disconnect all electrical devices and equipment as indicated and required. Disconnect electrical connections to mechanical and other equipment being removed by other trades.
- J. Wiring Removals: Where existing electrical devices or equipment are indicated to be removed, remove all associated wiring. Remove all abandoned or dead wiring back to source.
- K. Raceway Removals: Remove all abandoned raceways, boxes, supports, etc., where exposed and where they interfere with new work of any trade. Cut conduits flush with walls and floors, and cap.
- L. Existing Electrical Work to Remain: Protect and maintain access to existing electrical work, which must remain. Reinstall existing electrical work disturbed.
- M. Reconnections: Where electrical work in adjoining areas, or electrical work indicated to remain, becomes disconnected or affected by demolition work, reconnect circuits, etc., as required to restore original operation. Restoration work to comply with requirements for new work.
- N. Existing Electrical Work to be Relocated: Disconnect, remove, reinstall and reconnect existing devices and equipment indicated to be relocated and where required to accommodate remodeling or new construction. Extend existing installations as required. Materials and methods used for relocations and extensions to conform to requirements for new work.
- O. Shutdowns: All shutdowns to existing electrical services to be scheduled and approved, in writing, by the Owner's Representative.

3.16 RACEWAY SYSTEMS

- A. Raceway Types: Unless indicated otherwise, use raceway types as follows:
 1. Indoors, Concealed in Walls or Above Ceilings: EMT.
 2. Indoors, Exposed: Use rigid galvanized steel conduit below 10 feet above finished floor. EMT may be used above 10 feet.
 3. Indoors, Below Floor Slab: (Minimum 3/4 inch size). Schedule 80 rigid non-metallic conduit. Stub up using rigid galvanized steel elbows.
 4. Outdoors, Below Grade: (Minimum 1 inch size). Schedule 40 rigid non-metallic conduit. Stub up using rigid galvanized steel elbows.
 5. Outdoors, Exposed: Rigid galvanized steel conduit.
 6. Flexible Steel Conduit: Use (in dry locations only) for connections to transformers, vibrating equipment, and equipment requiring minor adjustments in positions for final connections to recessed lighting fixtures and between outlet boxes in metal stud partitions.

7. Liquid-Tight Flexible Steel Conduit: Use where flexible steel conduit connections are required in damp, wet, or oily locations, and for final connections to all motors and similar equipment.
- B. Raceway Routing: As required by job conditions unless specific routes or dimensioned positions are indicated on the Drawings. Install tight to slabs, beams, and joists wherever possible. Route exposed conduit, and conduit installed above ceilings, parallel or perpendicular to walls ceilings and structural members. Install to maintain minimum headroom and to present a neat appearance. Run parallel raceways together with bends made from same center line. Verify exact locations of all raceways, pull boxes, and junction boxes. Resolve any conflicts before installation.
- C. Raceway Installation: Cut conduit ends square using saw or pipecutter and ream each cut end smooth. Carefully make all conduit bends and offsets so that the inside diameter of pipe is not reduced. Make bends so that legs are in the same plane. Make offsets so that legs are in the same plane and parallel. Protect stub-ups from damage, and carefully rebend when necessary.
- D. Fittings: Make up all raceway fittings tight so that final installation of raceway, fittings and enclosures constitutes a firm mechanical assembly and a continuous electrical conductor. Where required, provide bonding jumpers to assure electrical continuity.
- E. Protection: Protect all raceways, enclosures, and equipment during construction to prevent entry of concrete, debris and other foreign matter. Free clogged conduits of all obstructions, or replace, prior to pulling wire. Do not pull wire within buildings until buildings are completely enclosed.
- F. Boxes: Install all outlet, pull, and junction boxes rigidly, plumb, and level. Support and secure boxes independently from conduits terminating at box. Install all boxes so as to be accessible and so that covers may be easily removed.
- G. Handholes: Provide as indicated, installed plumb and level. Where not indicated, install every 200 feet at a minimum.
- H. Conduit Seals: Install conduit seal for each conduit penetrating an exterior building wall below grade (unless penetration is below lowest building floor slab) and elsewhere as indicated, and so as to achieve a sealed watertight installation.
- I. Pull Strings: Provide pull strings in all spare conduits.

3.17 CONDUCTORS - 600 VOLT AND BELOW

- A. Minimum Conductor Size: All branch circuit wiring shall be minimum #12 AWG. All control circuit wiring shall be minimum #14 AWG unless indicated otherwise. Provide larger sizes as indicated or required.
- B. Branch Circuit Conductor Sizes: Provide branch circuit conductor sizes as indicated on the panelboard schedules, plans, or elsewhere. Neutral conductor size to match phase conductors unless indicated otherwise. Provide branch circuit switch legs and travelers as required for the switching indicated.
- C. Equipment Grounding Conductor Required: For each branch circuit and feeder run, provide an equipment grounding conductor for continuous length of run, sized per NEC 250-122 (minimum), larger if so indicated.
- D. Feeders: Provide feeder conductor sizes and quantities as indicated.
- E. In Raceway: Install all wiring in conduit or other specified raceway unless indicated otherwise.

- F. Terminations: Furnish and install terminations including lugs (if necessary) to make all electrical connections indicated or required. Make connections and terminations for all stranded AWG conductors using crimp, clamp, or box-type connectors and terminators. Enclose all strands of stranded conductors in connectors, and lugs.
- G. Color: Conductors #10 and smaller shall be factory color-coded by integral pigmentation with a separate color for each phase and neutral. #8 and larger shall have stripes, bands, hash marks, or color pressure-sensitive plastic tape. Color code all branch circuit and feeder conductors as follows:
1. 208/120 Volts:

PHASE	COLOR
A	Black
B	Red
C	Blue
Neutral	White

2. 480/277 Volts:

PHASE	COLOR
A	Brown
B	Orange
C	Yellow
Neutral	Gray

3. Equipment Grounding Conductors: Green

- H. Phase Arrangement: Arrange phases in all electrical equipment as follows:

1. A, B, C: Front to Rear.
2. A, B, C: Top to Bottom.
3. A, B, C: Left to Right when facing established front of equipment.

- I. Provide conductors with not less than 90 DegC rated insulation when branch circuit wiring is attached to high temperature light fixtures (e.g., fluorescent and HID), boilers, incinerators, ovens, ranges, kitchen exhaust fans, other heat-producing equipment, and “100 percent rated” overcurrent protective devices. Use special higher temperature wire as required for connection to specialty equipment as required by equipment manufacturer.

3.18 EQUIPMENT CONNECTIONS

- A. Connect complete, all equipment requiring electrical connections, furnished as part of this Contract or by others unless indicated otherwise.
- B. Equipment Variations: Note that equipment sizes and capacities as shown on the Contract Documents are for bidding purposes and as such may not be the exact unit actually furnished. Contractor shall anticipate minor variations in equipment and shall include in his Bid all costs required to properly connect the equipment actually furnished.
- C. Verification: Obtain and review shop drawings, product data, and manufacturer’s instructions for equipment furnished by others. Examine actual equipment to verify proper connection locations and requirements.
- D. Coordination: Sequence electrical rough-in and final connections to coordinate with installation and start-up schedule and work by other trades.

- E. Rough-In: Provide all required conduit, boxes, fittings, wire, connectors, miscellaneous accessories, etc., as necessary to rough in and make final connections to all equipment requiring electrical connections. In general, motors and equipment shall be wired in conduit to a junction box (or safety switch) near the unit, and from there to the unit in flexible metal or liquid-tight flexible steel conduit.
- F. Connections: Provide properly sized overload and short circuit protection for all equipment connected, whether furnished under this Contract or by others. Verify proper connections with manufacturer's published diagrams and comply with same. Verify that equipment is ready for electrical connections, wiring, and energization prior to performing same.
- G. Control Wiring: Provide all control wiring to remote devices or equipment as indicated or required. Modify equipment control wiring, install or disconnect jumpers, etc., as required.

3.19 HANGERS AND SUPPORTS

- A. General: Rigidly support and secure all electrical materials, raceway, and equipment to building structure using hangers, supports, and fasteners, suitable for the use, materials and loads encountered. Provide all necessary hardware.
- B. Overhead Mounting: Attach overhead mounted equipment to structural framework or supporting metal framework. Do not make attachments to steel roofing, steel flooring, or ceiling mineral tile.
- C. Wall Mounting: Support wall mounted equipment by masonry, concrete block, metal framing, or sub-framing.
- D. Exterior Walls: Mount all electrical equipment located on the interior of exterior building walls at least 1 inch away from wall surface using suitable spacers.
- E. Structural Members: Do not cut, drill, or weld any structural member.
- F. Independent Support: Do not support electrical materials or equipment from other equipment, piping, ductwork, or supports for same.
- G. Temporary Conditions: Do not attach to or support electrical work from removable or knockout panels or temporary walls or partitions.
- H. Raceway Supports: Rigidly support all raceway with maximum spacings per NEC and so as to prevent distortion of alignment during pulling operation. Use approved hangers, clamps, and straps for individual runs. Do not use perforated straps or tie wires. Where multiple parallel raceways are run together, use trapeze type hanger arrangement made from U-channel and accessories, suspended by threaded rods, and allow at least 25 percent spare capacity for future installation of additional raceways. Rigidly anchor vertical conduits serving floor-mounted or "island" type equipment mounted away from walls with metal bracket or rigid steel conduit extension secured to floor.
- I. Miscellaneous Supports: Provide any additional structural support steel brackets, angles, fasteners, and hardware as required to adequately support all electrical materials and equipment.
- J. Seismic restraints and supports: Provide as indicated and/or as required per seismic zone indicated.

3.20 ELECTRICAL IDENTIFICATION

- A. General: Locate nameplate, marking, or other identification means on outside of equipment or box front covers when above ceilings and when in mechanical or electrical equipment rooms or other

unfinished areas, and on inside of front cover when in finished rooms/areas. Use Contract Document designations for identification unless indicated otherwise.

- B. Nameplates: Provide nameplate engraved with equipment designation for each safety switch, panelboard, transformer, motor starter, and all other electrical cabinets, etc.
- C. Underground Warning Tape: During trench backfilling for each underground electrical, telephone, signal, and communications line, provide a continuous underground warning tape located directly above line at 6 to 8 inches below finished grade.
- D. Marking Pen Labeling: Mark each junction and pull box indicating source designation and circuit number(s) for the enclosed conductors.
- E. Wire Tags: For power circuits, apply wire tag indicating appropriate circuit or feeder number to each conductor present in distribution panel and panelboard gutters, and to each conductor in pull and junction boxes where more than one feeder or multi-wire branch circuit is present. Where only a single feeder or multi-wire branch circuit is present, box cover labeling and conductor color coding is sufficient. For control, communications, and signal circuits, apply wire tag indicating circuit or termination number at all terminations and at all intermediate locations and boxes where more than one circuit is present.
- F. Panelboard Circuit Directories: At completion of project, accurately complete each panelboard circuit directory card, identifying load served or "spare" or "space" for each circuit pole. When modifying, adding or deleting circuits at an existing panelboard, update the existing (or provide new) circuit directory card to accurately reflect final conditions.
- G. Abandoned Equipment: Label all abandon equipment as "Abandon as of ____." For conduits and conductors, include opposite end location.

3.21 ELECTRIC SERVICE

- A. General: Arrange with the local electric utility company and pay all associated costs for providing temporary electric service (if required) and permanent electric service for the project as indicated and required. Comply with and coordinate all requirements of the utility company.
- B. Grounding: Provide grounding electrode system for the service per the NEC and utility company requirements.

3.22 GROUNDING

- A. General: Provide all system and equipment grounding as indicated and required by the NEC.
- B. Equipment Grounding: Provide a green equipment grounding conductor, sized per NEC 250-122 (larger if so indicated), with each feeder and branch circuit run.
- C. Provide exothermic welded connections where indicated.

3.23 PANELBOARDS

- A. Secure rough-in boxes to building structure or steel framing, independent of conduits. Install with top of cabinet at 7 feet 0 inches above floor but with minimum 8-inch clearance above floor unless so doing would exceed maximum 6-foot 6-inch disconnect height allowed by NEC.
- B. Cover all unused overcurrent protective device spaces.

3.24 LIGHTING FIXTURES

- A. Lamps and drivers: Replace all burned out, defective, and inoperative lamps, and all noisy, defective, and inoperative drivers, starters, etc., prior to Owner's acceptance.

3.25 LIGHTING CONTROL EQUIPMENT

- A. Lighting Control Relays: Connect "Auto" position of relay H-O-A selector switch through photoswitch or other indicated control contacts, and the "HAND" position to override the automatic control.
- B. Photoswitches: Adjust sensitivity for proper operation.

3.26 CHECKOUT, TESTING, AND ADJUSTING

- A. General: Provide testing equipment, materials, instruments, and personnel to perform all test procedures and adjustments required by the Contract Documents and/or deemed necessary by the Engineer to establish proper performance and installation of electrical systems and equipment. All test instruments to be accurately calibrated and in good working order.
- B. Scheduling: Schedule tests at least three days in advance, and so as to allow Engineer and Owner representative(s) to witness the test, unless directed otherwise. Do not schedule tests until the system installation is complete and fully operational unless indicated or directed otherwise.
- C. Manufacturer's Authorized Representatives: For all new and modified systems and equipment, arrange and pay for the services of the manufacturer's authorized representative(s) to be present at time of equipment or system start-up, to supervise the start-up, and to conduct and/or certify all required testing and adjusting.
- D. Test Reports: Submit test reports neatly typewritten on 8-1/2-inch-by-11-inch sheets indicating system or equipment being tested, methodology of testing, date, and time of test, witnesses of test, and test results. Submit test reports in three (3) copies to the Engineer for review within five (5) days after test is performed, and include a copy with the appropriate operation and maintenance data.
- E. Correction/Replacement: After testing, correct any deficiencies, and replace materials and equipment shown to be defective or unable to perform at design or rated capacity. Retest without additional cost to the Owner or Contract. Submit finalization report indicating corrective measures taken and satisfactory results of retest.

3.27 SYSTEMS DEMONSTRATION

- A. Instruct the Owner's representative(s) in the start-up, operation, and maintenance of all electrical systems and equipment in accordance with Division 1 and as requested by the Owner's Representative.

3.28 CLEANING AND TOUCH-UP PAINTING

- A. Perform cleaning required by Division 1.
- B. General: Periodically remove from the project site, all waste, rubbish, and construction debris accumulated from construction operations, and maintain order. The premises shall be left clean and free of any debris and unused construction materials prior to final acceptance.

- C. Electrical Equipment: Remove all dust, dirt, debris, mortar, wire scraps, rust, and other foreign materials from the interior and exterior of all electrical equipment and enclosures, and wipe down. Clean accessible current carrying elements and insulators prior to energizing.
- D. Light Fixtures: Thoroughly clean all new or relocated light fixtures and lamps, just prior to final inspection. Fixture enclosures, reflectors, lenses, etc., shall be cleaned free of dust, dirt, fingerprints, etc., by an approved method.
- E. Touch-Up Painting: Restore and refinish to original condition, all surfaces of electrical equipment scratched, marred, and/or dented during shipping, handling, or installation. Remove all rust, and prime and paint as recommended by the manufacturer.

END OF SECTION

SECTION 265668 – LED EXTERIOR ATHLETIC LIGHTING

PART 1 – GENERAL

1.1 SUMMARY

- A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- B. The purpose of these specifications is to define the lighting system performance and design standards for the Murnane Field Retrofit Sports Lighting project using an LED Lighting source and existing Musco Light-Structures. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications. Musco was selected as the basis-of-design for this project. As such, Musco Lighting, Inc. is an approved manufacturer for this project. The selection of Musco as the basis-of-design is not intended to indicate that Musco is the preferred manufacturer, but was done to allow a design to be prepared and to set the standard of quality for the project. It is understood that other manufacturers may require different quantities of fixtures, in total and per pole, as well as other subtle differences that make a generic design that is applicable to all manufacturers impossible to achieve.
- C. The sports lighting will be for the following venues:
 - 1. Baseball Field
 - 2. Bullpens
 - 3. Batting Cages
 - 4. Uncovered Pedestrian Areas
- D. The primary goals of this sports lighting project are:
 - 1. Retrofit existing Musco HID Luminaires (1500W MZ) with LED system to improve on-target performance, playability, off-target spill/glare control, safely re-use existing infrastructure, and to reduce energy consumption.
 - 2. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators; therefore, light levels are guaranteed to not drop below specified target values for a period of 25 years.
 - 3. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors. The LED design should provide better light control than current HID design.
 - 4. Cost of Ownership: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated for the duration of the warranty.
 - 5. Control and Monitoring – To allow for optimized use of labor resources and avoid unneeded operation of the facility, a remote on/off control system for the lighting system shall be provided. The field should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.
 - a. Control and monitoring system shall provide contactor control of all existing circuits. Key switches shall be added to provide field-level control of existing circuit groups.

1.2 LIGHTING PERFORMANCE

- A. **Illumination Levels and Design Factors:** Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting manufacturers will provide a guarantee that light levels will be sustained over the life of the warranty period. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below.

Manufacturers must provide lumen maintenance data of the LED luminaires used per TM-21-11 and will incorporate the lumen maintenance projections into the lighting designs to ensure target light levels are achieved throughout the guaranteed period of the system. Per IES guidelines, lumen maintenance hours should be reported based on the 6x multiplier of testing hours.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Baseball Infield	70fc	2:1	25	30.0' x 30.0'
Baseball Outfield	50fc	2.5:1	108	30.0' x 30.0'
Bullpens	50fc	2:1	32	10.0' x 10.0'
RF Batting Cage	45fc	2:1	24	10.0' x 10.0'
LF Batting Cage	35fc	2:1	39	10.0' x 10.0'
Uncovered Pedestrian	20fc	2:1	48	10.0' x 10.0'

- B. **Color Temperature:** The lighting system shall have a minimum color temperature of 5700K and a CRI of 75.
- C. **Playability:** Lighting design and luminaire selection should be optimized for playability by reducing glare on field and providing sufficient uplight.
- Aiming Angles:** To reduce glare, luminaire aiming should ensure the top of the luminaire field angle (based on sample photometric reports) is a minimum of 10 degrees below horizontal.
 - Glare Control Technology –** Luminaires selected should have glare control technology including, but not limited to: external visors, internal shields and louvers. No symmetrical beam patterns are acceptable.
 - Aerial lighting –** Adequate illumination must be provided above the field in order to see the ball in flight. It is recommended that a lighting analysis be performed above the field of play to evaluate the visibility of the ball over its typical trajectory to ensure the participants will adequately see the ball. Calculation planes should be evaluated up to the maximum anticipated height for the level of play.
 - Mounting Heights:** To ensure proper aiming angles, minimum mounting heights shall be as described below. Higher mounting heights may be necessary for luminaire with lesser glare control to meet field angle requirements of section 1.2.C.1.

# of Poles	Pole Designation	Mounting Pole Height
Two (2)	A1-A2	82'
Two (2)	B1-B2	90'
Two (2)	C1-C2	76'
Two (2)	D1-D2	75'

1.3 ENVIRONMENTAL LIGHT CONTROL

- A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.
- B. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet or 5 feet (cd) above grade at 30-foot intervals.

Residential Property Spill (spill/glare values at residential properties east)	Average	Maximum
Max Horizontal Spill Light (all zones) at adjacent residential properties	0.2 fc	0.25 fc
Max Vertical Spill Light (all zones) at adjacent residential properties	0.2 fc	0.25 fc
Max Candela (per fixture, all zones) at adjacent residential properties	5,000 cd	7,000 cd

Residential Property Spill (spill/glare values at residential properties west)	Average	Maximum
Max Horizontal Spill Light (all zones) at adjacent residential properties	0.25 fc	0.5 fc
Max Vertical Spill Light (all zones) at adjacent residential properties	0.25 fc	0.75 fc
Max Candela (per fixture, all zones) at adjacent residential properties	2,500 cd	7,000 cd

Glare to Batters and Outfielders	Average	Maximum
Max Candela (per fixture from C1-C2 and D1-D2) to any batter	500 cd	1,000 cd
Max Candela (per fixture from A1-A2) to LF, CF, RF outfielders	2,500 cd	4,500 cd

- C. Spill Scans: Spill scans must be submitted indicating the amount of horizontal footcandles, maximum vertical footcandles, and candela values 150' from field boundary and adjacent residential properties (east and west) as defined. Calculations shall be shown at 30-foot intervals along 150' boundary from edge of field and other critical spill lines as defined. Calculations and subsequent readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights. Illumination level shall be measured in accordance with the IESNA RP-6-22.
- D. Glare analysis to batters from outfield poles (C1, C2, D1, D2), and outfielders from infield poles (A1, A2), must also be provided. Assume the following outfield positions for LF (47', 269'), CF (220', 220'), and RF (269', 47') relative to home plate (0', 0').
- E. Sample Photometry: The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years' experience or by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

- F. Field Verification: Lighting manufacturer shall supply field verification of environmental light control using a meter calibrated within the last 12 months:
 - 1. Spill verification: The light sensing surface of the light meter should be held 36 inches above the playing surface with the sensing surface horizontal (for horizontal readings) or vertically pointed at the brightest light bank (for max vertical readings).
- G. Glare verification: The light sensing surface of the luminous intensity meter should be held 60 inches above grade with the aperture adjusted so that it detects luminous intensity from the brightest luminaire on each light bank.

1.4 LIFE-CYCLE COSTS

- A. Manufacturer shall submit a 25 year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

PART 2 – PRODUCTS

2.1 SPORTS LIGHTING SYSTEM CONSTRUCTION

- A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.
- B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.
- A. System Description: Lighting system is intended to mount to existing structures and shall reuse existing foundations, poles, and underground supply wiring. The system shall consist of the following:
 - 1. Existing equipment: Lighting manufacturer is required to provide an analysis and inspection of existing poles and foundations to ensure poles are strong enough to handle weight and windloading of new lighting equipment.
 - 2. Poletop luminaire assembly: Galvanized steel poletop luminaire assemblies to replace existing poletop by slip fit over the pole sections, bolting to top flange, or clamping to pole. Lighting manufacturer must supply new crossarms, or supply calculations that show crossarms are strong enough to support new loads without deflection.
 - 3. All luminaires, visors, and poletop luminaire assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.

4. Manufacturer will supply all drivers and supporting electrical equipment.
 - a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure.
 - b. Alternate: Integral drivers mounted at the top of the pole are allowed if lighting manufacturer is responsible for all costs and work associated with removal of faulty luminaires, and will require a pole mounted enclosure approximately 10 feet above grade. The enclosure shall include a disconnect per circuit, individual luminaire fusing, and surge protection.
 - c. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
 5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
 6. Control and monitoring cabinet with contactors to provide remote on-off control, monitoring, of the lighting system. See Section 2.3 for further details.
 7. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
 - a. If grounding is not integrated into the structure, the manufacturer or installer shall supply grounding electrodes, down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780.
- C. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

- A. Electric Power Requirements for the Sports Lighting Equipment:
 1. Electric power: 480 Volt, 3 Phase

2.3 STRUCTURAL PARAMETERS

- A. Wind Loads: Wind loads shall be based on the 2018 International Building Code. Wind loads to be calculated using ASCE 7-16, an ultimate design wind speed of 110 mph and exposure category C.
- B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2013 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-6).

2.4 CONTROL

- A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.
- B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.
- C. Contactor control of lights: To minimize wear on drivers and other electrical components and prevent lights from turning on due to communication loss, circuits must be controlled via contactor switching, not dimming driver output to zero.

- D. Dimming: System shall provide for 3-stage dimming (high-medium-low). Dimming will be set via scheduling options (Website, app, phone, fax, email)
- E. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields to only having permission to execute “early off” commands by phone. Scheduling tool shall be capable of setting curfew limits.

Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

- F. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).
- G. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.

Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.

1. Cumulative hours: shall be tracked to show the total hours used by the facility
2. Report hours saved by using early off and push buttons by users.

- H. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.
- I. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Before performing any Work, lay out the proposed routing for the conduits, location of light poles, etc. and have it approved by the Owner’s Representative and Company Field Adviser.

3.2 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Packaging and Transportation:
 1. Require supplier to package finished products in boxes or crates for protection during shipment, handling and storage. Protect sensitive products against exposure to elements and moisture.
 2. Protect sensitive equipment and finishes against impact, abrasion and other damage.
 3. Remove and replace with new, products that are damaged prior to final acceptance by Owner.

- B. Delivery and Receiving:
 - 1. Arrange delivery of products in accordance with construction schedule. Allow time for inspection prior to installation.
 - 2. Coordinate deliveries to avoid conflict with work and conditions at site, limitations on storage space and availability of personnel and handling equipment.
 - 3. Deliver products in undamaged, dry conditions, in original unopened containers or packaging with identifying labels intact and legible.
 - 4. Clearly mark partial deliveries of component parts of equipment to identify equipment and contents to permit easy accumulation of parts and to facilitate assembly.
 - 5. Immediately on deliver, inspect shipment to assure:
 - a. Product complies with requirements of Contract Documents and reviewed submittals.
 - b. Quantities are correct.
 - c. Accessories and installation hardware are correct.
 - d. Containers and packages are intact and labeled.
 - e. Products are protected and undamaged.

- C. Product Handling:
 - 1. Provide equipment and personnel to handle products by methods to prevent soiling and damage.
 - 2. Provide additional protection during handling to prevent marring and otherwise damaging products, packaging and surrounding surfaces.
 - 3. Handle product by methods to avoid bending or overstressing. Lift large and heavy components only at designated lift points.

- D. Storage:
 - 1. Store products, immediately on delivery, in accordance with manufacturer's instructions, with seals and labels intact. Protect until installed.
 - 2. Arrange storage to provide access for maintenance of stored items and for inspection.
 - 3. Exterior storage:
 - a. Provide substantial platforms, blocking or skids to support fabricated products above ground; slope to provide drainage.
 - b. Protect products form soiling and staining.
 - c. For products subject to discoloration or deterioration form exposure to elements, cover with impervious sheet material.
 - d. Provide ventilation to avoid condensation.
 - e. Store loose granular materials on clean, solid surfaces such as rigid sheet materials or pavement. Prevent mixing with foreign matter.
 - f. Prevent mixing of refuse or chemically injurious materials or liquids with building materials.
 - 4. Periodically inspect stored products to verify proper storage.

3.3 INSTALLATION

- A. Conduit System
 - 1. Use rigid galvanized steel conduit and rigid nonmetallic conduit as specified or indicated. Where conduits enter concrete light pole bases, provide rigid galvanized steel conduit.
- B. Grounding
 - 1. Provide an equipment grounding conductor installed within each conduit. Connect equipment grounding conductor to driver enclosure and ground lug on pole.

3.4 DELIVERY TIMING

- A. Delivery Timing Equipment On-Site: The equipment must be on-site 10-12 weeks from receipt of approved submittals and receipt of complete order information.

3.5 FIELD QUALITY CONTROL

- A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA RP-6-22.
- B. Field Light Level Accountability
 - 1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as “guaranteed” on the illumination summary provided by the manufacturer.
 - 2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.
 - 3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities, including off-site spill and glare. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.
- C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles, uniformity ratios, and upright for aerial visibility are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.6 WARRANTY AND GUARANTEE

- A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.
- B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

3.7 ACCEPTANCE

- A. Basis of acceptance for sports field lighting shall be the complete installation of all items specified herein in accordance with the plans, specifications, approved shop drawings, and to the satisfaction of the Owner’s Representative and Company Field Advisor.

END OF SECTION

SECTION 310519.13 – GEOTEXTILES

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the installation of separation/stabilization fabric as shown on the Drawings and as specified herein.
- B. The latest edition of the following standards, as referenced herein, shall be applicable.
 - 1. American Society for Testing and Materials (ASTM).

1.2 SUBMITTALS

- A. Product Data:
 - 1. Submit Manufacturer's material specifications, product literature and installation instructions.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 - 1. Deliver sufficient materials to the site to prevent interruption of the work.
 - 2. All materials shall be inspected by Contractor upon delivery. Contractor shall notify Engineer of any damage. Products received at the site torn, with holes, deteriorated, or otherwise damaged will not be approved and shall be returned and replaced at no expense to the Owner.
- B. Storage:
 - 1. All material shall be stored in strict accordance with the manufacturer's recommendations and as approved by the Engineer.
 - 2. Do not store products directly on ground. Ship and store geotextile with suitable wrapping for protection against moisture and ultraviolet exposure. Store geotextile in way that protects it from elements, if stored outdoors, elevate, and protect geotextile with waterproof cover.
- C. Handling:
 - 1. All material shall be handled in strict accordance with the manufacturer's recommendations and as approved by the Engineer.

PART 2 – PRODUCTS

2.1 WOVEN GEOTEXTILE

- A. Stabilization Fabric: To be used beneath roadways and walks.
- B. Composed of polymeric yarn interlaced to form a planar structure with uniform weave pattern.
- C. Calendared or finished so yarns will retain their relative position with respect to each other.
- D. Polymeric Yarn: Long-chain synthetic polymers (polyester or polypropylene) with stabilizer or inhibitors added to make filament resistant to deterioration due to heat and ultraviolet light exposure.
- E. Sheet Edges: Selvaged or finished to prevent outer material from separating from sheet.

- F. Unseamed Sheet Width: Minimum 12 feet.
- G. Physical Properties: Conform to requirements noted below:

PROPERTY	DESIGN VALUE	TEST METHOD
Tensile Strength	315 pounds	ASTM D4632
Elongation	12 percent	ASTM D4632
Trapezoidal Tear	113 pounds	ASTM D4533
CBR Puncture Strength	900 pounds	ASTM D6241
A.O.S.	40 (US Sieve)	ASTM D4751
Permittivity	.05 sec ⁻¹	ASTM D4491

2.2 NONWOVEN GEOTEXTILE

- A. Separation/Filtration Fabric: To be used in drainage ditches, haybale installation, culvert outfall installations, rip-rap outfall installations, and cover material separation
- B. Pervious sheet of polyester, polypropylene, or polyethylene fabricated into stable network of fibers that retain their relative position with respect to each other. Nonwoven geotextile shall be composed of continuous or discontinuous (staple) fibers held together through needle-punching, spun-bonding, thermal-bonding, or resin-bonding.
- C. Geotextile Edges; selvaged or otherwise finished to prevent outer material from pulling away from geotextile.
- D. Unseamed Sheet Width: Minimum 12 feet.
- E. Physical Properties: Conform to the requirements noted below:

PROPERTY	DESIGN VALUE	TEST METHOD
Tensile Strength	160 pounds	ASTM D4632
Elongation	50 percent	ASTM D4632
Trapezoidal Tear	60 pounds	ASTM D4533
CBR Puncture Strength	400 pounds	ASTM D6241
A.O.S.	70 (US Sieve)	ASTM D4751
Permittivity	1.4 sec ⁻¹	ASTM D4491

PART 3 – EXECUTION

3.1 GENERAL

- A. The Contractor shall be responsible for the installation, and seaming of geotextile fabric in accordance with the specifications and the manufacturer's recommendations, as approved by the Engineer.

3.2 SUBGRADE PREPARATION

- A. Surfaces to be covered with geotextile fabric shall be smooth and free of rocks, sticks, roots, sharp objects, and all debris that may damage the fabric. The surface to be covered shall be firm and unyielding, with no sudden changes or breaks in grade. There shall be no standing water or excessive moisture on the surface when the fabric is placed.

- B. The compacted subgrade shall be maintained in a smooth, uniform, and compacted condition during installation of the fabric.

3.3 GEOTEXTILE INSTALLATION

- A. The fabric shall be cleaned of all debris or other materials that may negatively affect the fabric's performance.
- B. Mechanical equipment shall not be permitted to operate directly on the fabric unless authorized to do so by the manufacturer and approved by the Engineer.
- C. Geotextile Placement:
 - 1. Fabric shall be placed as recommended by the manufacturer and approved by the Engineer on surfaces which have been prepared to conform with these Specifications and found acceptable for fabric installation.
 - 2. The fabric shall be placed as smooth and wrinkle-free as possible.
 - 3. When installing geotextile in trenches, swales, ditches, etc., overlap geotextile in the direction of flow.
 - 4. All areas of fabric damaged during installation as determined by the Engineer shall be repaired or replaced by the Contractor as specified at no additional cost to the Owner. Should the fabric be damaged during any step of the installation, the damaged section shall be repaired by covering it with a piece of fabric which extends at least 24 inches in all directions beyond the damaged area. The fabric shall be secured by sewing or bonding as approved by the Engineer.
 - 5. At time of installation, fabric will be rejected if it has defects, ribs, holes, flaws, deterioration, or damage incurred during manufacture, transportation, handling, or storage. Damaged materials shall be removed and replaced at no additional cost to the Owner.
 - 6. Fabric shall be placed with long dimension down slope.
 - 7. Fabric shall be protected at all times during construction from contamination by surface run-off and any fabric so contaminated shall be removed and replaced with uncontaminated fabric.
- D. Seams and Overlaps of Geotextile:
 - 1. All overlaps shall be a minimum of 18 inches (450 mm).

3.4 COVER MATERIALS OVER GEOTEXTILES

- A. Granular materials shall be placed on geotextiles as shown on the Drawings. During backdumping and spreading, a minimum depth of 6 inches of granular material shall be maintained at all times between the fabric and wheels of trucks or spreading equipment. All equipment used in spreading or traveling on the cover layer for any reason shall exert low ground pressures and shall be approved by the manufacturer and Engineer. Dozer blades, etc., shall not make direct contact with the fabric; however, if tears occur in the fabric during the spreading operation, the granular material shall be cleared from the fabric and the damaged area repaired as previously described.
- B. The granular material shall be spread in the direction of fabric overlap. Large fabric wrinkles which may develop during the spreading operations shall be folded and flattened in the direction of the spreading. Occasionally, large folds may reduce the fabric overlap width. Special care shall be given to maintain proper overlap and fabric continuity.
- C. All equipment spreading cover material or traveling on the cover layer shall avoid making sharp turns, quick stops, or quick starts.

- D. Fabric shall be covered as soon as possible after placement to minimize exposure to sunlight. Fabric shall not be exposed for more than 5 days.

3.5 DISPOSAL OF SCRAP MATERIALS

- A. On completion of installation, the Contractor shall legally dispose of all trash and scrap material off-site or in a location approved by the Owner and Engineer, remove equipment used in connection with the work herein, and shall leave the premises in a neat acceptable manner.

END OF SECTION

SECTION 311000 – SITE CLEARING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Protecting existing trees, shrubs, groundcovers, plants, and grass to remain.
 - 2. Removing existing trees, and grass.
 - 3. Clearing and grubbing.
 - 4. Stripping and stockpiling topsoil.
 - 5. Removing above- and below-grade site improvements.
 - 6. Disconnecting, capping or sealing, and abandoning site utilities in place or removing site utilities.

1.2 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.
- B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.
- C. Grubbing: Removal of vegetation and other organic matter including stumps, buried logs, and roots.

1.3 MATERIAL OWNERSHIP

- A. Except for excess stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.4 SUBMITTALS

- A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.
- B. Record drawings, according to Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.
- C. Certification: Submit written certification by qualified arborist that trees indicated to remain have been protected during the course of construction in accordance with recognized standards and that where damage did occur, trees were promptly and properly treated. Indicate which damaged trees (if any) are incapable of retaining full growth potential and are recommended to be replaced.

1.5 QUALITY ASSURANCE

- A. Stake limits of clearing, grubbing, and stripping, prior to commencing of work.

1.6 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction. Detour routes shall be identified by adequate signs in accordance with the MUTCD.
- B. Protect areas outside limits of disturbance from encroachment by construction personnel or equipment, regardless of property Ownership. Access shall be by specific, written permission or easement only
- C. Salvageable Improvements: Carefully remove items indicated to be salvaged and deliver to storage location defined on the plans or specified here in.
- D. Utility Locator Service: Properly notify utility locator service for area where Project is located before site clearing in accordance with local protocol.
- E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.
- F. Contractor shall verify existing grades prior to performing work under this section. If existing grades are at variance with the drawings, notify the Owner and receive instructions prior to proceeding. No additional compensation will be considered resulting from grade variances once site clearing has commenced.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly flag, fence and protect trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TREE PROTECTION

- A. Erect and maintain temporary fencing around tree drip line before starting site clearing. Remove fence when construction is complete.
 - 1. Do not store construction materials, debris, or excavated material within fenced area.
 - 2. Do not permit vehicles, equipment, or foot traffic within fenced area.
 - 3. Maintain fenced area free of weeds and trash.
- B. Do not machine excavate within tree drip line.

- C. Where excavation for new construction is required within tree drip line, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
- D. Do not allow exposed roots to dry out before permanent backfill is placed; provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in moist condition and temporarily support and protect from damage until permanently relocated and covered with earth.
 - 1. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 - 2. Coat cut faces of roots more than 1-1/2 inches (38 mm) in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
 - 3. Backfill with soil as soon as possible.
 - 4. Where trenching for utilities is required within drip line, tunnel under or around roots by hand digging. Do not cut main lateral roots or tap roots; cut only smaller roots that interfere with installation of new work. Cut roots with sharp pruning instruments; do not break or chop.
- E. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Engineer and acceptable to the Owner.
 - 1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
 - 2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Engineer and acceptable.

3.3 UTILITIES

- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Owner will arrange to shut off indicated utilities when requested by Contractor.
- C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer, Construction Manager, Owner's Representative, and owner not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer, Construction Manager, or Owner's Representative written permission.
- D. Excavate for and remove underground utilities indicated to be removed.

3.4 CLEARING AND GRUBBING

- A. Completely remove obstructions, trees, shrubs, stumps, roots, grass, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 - 3. Use only hand methods for grubbing within tree protection zone.

4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations in accordance with Section "Earth Moving" unless further excavation or earthwork is indicated.
 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm) and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Where trees are designated to remain, stop topsoil stripping and adequate distance from the trees to prevent damage to the main root system.
- C. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 1. Remove subsoil and non-soil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.
- D. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
 2. Do not stockpile topsoil within tree protection zones.
 3. Dispose of excess topsoil as specified for waste material disposal.

3.6 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
 2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.7 DISPOSAL

- A. Burning of debris onsite is not permitted.
- B. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
 1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.
 2. Debris may be buried in designated onsite disposal areas to minimum depth of 3 feet below final grade. Only the following materials are suitable for on-site disposal:
- C. Dispose of all diseased Elmwood within 4 days after cutting by burning or by other methods approved by the Department of Environmental Conservation.

END OF SECTION

SITE CLEARING

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SECTION 312000 – EARTH MOVING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the preparation of the site, protection, excavation, embankment, drainage, dewatering, for site grading, as shown on the Drawings, and as herein specified.
- B. The Contractor shall accept the site in the condition in which it exists at the time of the award of the Contract.
- C. The Engineer shall determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. The latest edition of the following standards, as referenced herein, shall be applicable.
 - a. "Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering."
 - b. "Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)."
- B. The Contractor shall comply with the requirements for soil erosion and sedimentation control, and other requirements of governmental authorities having jurisdiction, including the State of New York.
- C. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications in accordance with Section "Quality Requirements."

1.3 SUBMITTALS

- A. Samples:
 - 1. The Contractor shall furnish earth materials to the testing laboratory for analysis and report, as directed by the Engineer, or as outlined in the specifications.
- B. Test Results:
 - 1. The testing laboratory shall submit written reports of all tests, investigations, and recommendations to the Contractor and the Engineer.

1.4 PROJECT REQUIREMENTS

- A. Notify the Engineer of any unexpected subsurface condition.
- B. Protection of Existing Utilities:
 - 1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate support and protection during earthwork operations, comply with OSHA requirements.
 - 2. Coordinate interruption and/or termination of utilities with the utility companies and the Owner.

3. Provide a minimum of 48 hours' notice to the Owner and receive written notice to proceed before interrupting any utility.
 4. Demolish and completely remove from the site any existing underground utilities designated to be removed as shown on the Drawings or as specified in Section "Site Clearing."
 5. Repair any damaged utilities as acceptable to the Engineer, at no additional cost to the Owner.
- C. Protection of Persons and Property:
1. Barricade open excavations occurring as part of this work, and post with warning lights.
 2. Operate warning lights as recommended by authorities having jurisdiction.
 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 4. Perform excavation within drip-line of large trees to remain by hand and protect the root system from damage or dryout to the greatest extent possible. Maintain moist conditions for root system and cover exposed roots with burlap. Paint root cuts of 1-inch diameter and larger with emulsified asphalt tree paint.

PART 2 – PRODUCTS

2.1 PRECONSTRUCTION MATERIAL QUALIFICATION TESTING

- A. A 100-pound minimum representative sample shall be obtained from each potential borrow source. If different material gradations are known to exist in the pit, samples shall be obtained for each material. Each sample shall be mixed thoroughly and reduced to test specimen size, in accordance with AASHTO T87. The test shall be performed in the order shown. Failure to pass any test is grounds for disqualification and shall lead to cessation of the test program for that material.
1. Particle Size Analysis:
 - a. Method: ASTM D422.
 - b. Number of Tests: One (1) per potential source.
 - c. Acceptance Criteria: Gradation within specified limits.
 2. Maximum Density Determination:
 - a. Method: ASTM D1557, Modified Proctor.
 - b. Number of Tests: One (1) per potential source.
 3. Re-establish gradation and maximum density of fill material if source is changed during construction.

2.2 MATERIALS

- A. Select Granular Material: Sound, durable, sand, gravel, stone or blends with these materials, free from organic, frozen, or other deleterious materials, conforming to the requirements of NYSDOT Section 304 and meeting the following gradation requirements (NYSDOT Type 4)]:

SIEVE	PERCENT PASSING
2"	100
1/4"	30 - 65
No. 40	5 - 40
No. 200	0 - 10

- B. Selected Fill: Sound, durable, sand, gravel, stone, or blends of these materials, free from organic, frozen or other deleterious materials.

SIEVE	PERCENT PASSING
4"	100
No. 40	0 - 70
No. 200	0 - 10

1. Fines passing No. 200 shall be non-plastic.
2. Particle size analysis shall show no gap grading.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Establish required lines, levels, contours, and datum.
- B. Maintain benchmarks and other elevation control points. Re-establish, if disturbed or destroyed, at no additional cost to the Owner.
- C. Establish location and extent of utilities before commencement of grading operations.

3.2 EXCAVATION

- A. Excavation shall consist, in general, of the excavation of whatever substance is encountered to the lines, grades, and sections shown on the Drawings including excavation as necessary for grading and other similar features.
- B. All suitable materials removed in excavation shall be used in the construction of embankments, subgrade, shoulders, slopes, and at such other places as directed. The Engineer shall be the sole judge of what constitutes suitable material.
- C. During construction, the grading operations shall be executed in such a manner that the excavation will be well drained at all times. All grading shall be finished on neat, regular lines conforming to the sections and contours shown on the Plans.
- D. Removal of materials beyond the indicated subgrade elevations, without authorization by the Engineer, shall be classified as unauthorized excavation and shall be performed at no additional cost to the Owner.
- E. Excavation shall be performed in proper sequence with all other associated operations.
- F. Maintain the slopes of excavation in a safe condition until completion of the grading operation.
- G. All excavation work shall be inspected and approved by the Engineer before proceeding with construction.
- H. Any excess excavation shall be removed from the site to disposal areas at the Contractor's expense.

3.3 FILL

- A. All site fill shall be “selected fill” unless otherwise shown on the Drawings or directed by the Engineer. “Select granular fill” shall be placed in lieu of selected fill where directed by the Engineer.
- B. Before depositing fills, the surface of the ground shall be cleared of all refuse, brush, and large stones. Conform to Section "Site Clearing."

- C. Prior to placing fill over undistributed material, scarify to a minimum depth of 6 inches.
- D. Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be plowed or scarified deeply or where the slope ratio of the original ground is steeper than 2 horizontal to 1 vertical, the bank shall be stepped or benched.
- E. The original ground shall be proof rolled until the underlying soil is thoroughly compacted to the satisfaction of the Engineer before any filling is begun. A steel-wheel tandem roller weighing 8 to 10 tons or equipment capable of obtaining the same effort shall be used to obtain a thoroughly compacted subgrade. Remove or recompact any soft or loose soils as determined by the Engineer prior to filling.
- F. A thoroughly and satisfactorily subgrade is defined as having a minimum dry density of 95 percent of the maximum density of the material used. The subgrade material shall be compacted at a moisture content suitable for obtaining the required density.
- G. Place backfill and fill materials in layers not more than 12 inches in loose depth unless shown otherwise on the Drawings. Lift height shall be governed by the ability of the compaction equipment to obtain the required compaction with 12 inches as a maximum lift height. Before compaction, moisten or aerate each layer as necessary to facilitate compaction to the required density. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost, ice, ponded water, or extraneous debris.
- H. When work is suspended during periods of freezing weather, measures shall be taken to prevent fill already in place from freezing. Upon resumption of work after any inclement weather, prepare the exposed surface by proof rolling to identify any zones of soft/loose soils. Soft/loose materials or frozen soils shall be removed and replaced by compacted granular fill.
- I. Moisture Control:
 - 1. Where fill or backfill must be moisture conditioned before compaction, uniformly apply water to the surface and to each layer of fill or backfill. Prevent ponding or other free water on surface subsequent to, or during, compaction operations.
 - 2. Remove and replace, or scarify and air dry, soil that is too wet to permit compaction to specified density. Soil that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a value which will permit compaction to the percentage of maximum density specified.
- J. All fill shall be thoroughly and satisfactorily compacted to 95 percent of the maximum density of material used.

3.4 GRADING

- A. The present and finished grade lines are shown on the Drawings. Grade over the entire area, as shown on the drawings, shall be to the finished subgrade levels. Upon completion of this work, all debris shall be cleaned out and removed from the premises.
- B. All cutting, filling, backfilling and grading necessary shall be done to bring the area to the following grade or subgrade levels:
 - 1. For roadway surface areas to the finished subgrade levels specified on the contract drawings.
 - 2. For areas to be topsoiled and seeded to within 6 inches of the finished grade.
 - 3. For other surface treatments as detailed on the Drawings.

- C. Sufficient grading must be done during the progress of the work so that the entire site shall be well drained and free from water pockets.
- D. Finish grading, including dressing swales, cleaning up excess footing excavation, dressing terraces, disposing of excess material and all other work necessary to prepare the site for topsoil and seeding shall be done after construction of structures and roadway surface areas is substantially complete.

3.5 COMPACTION EQUIPMENT

- A. Compaction equipment used for the Work is subject to approval by the Engineer. Any equipment not originally manufactured for compaction purposes and equipment which is not in proper working order will not be approved. Furnish manufacturer's specifications covering data not obvious from a visual inspection of the equipment and necessary to determine its classification and performance characteristics.

3.6 DRAINAGE AND DEWATERING

- A. Prevent surface, subsurface or ground water from flowing into excavation and from flooding project area, as well as surrounding areas.
- B. Do not allow water to accumulate in excavations. Remove water to prevent soil changes detrimental to the stability of subgrades.
- C. Provide and maintain the pumps, well points, sumps, suction and discharge lines, and other dewatering components necessary to convey water away from excavations.
- D. Provide and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations by dewatering, to collection or run-off areas.
- E. Dewatering operations shall be as directed by the Engineer and performed in accordance with Section "Dewatering."

3.7 FIELD QUALITY CONTROL

- A. Notify the Engineer at least one (1) working day in advance of all phases of filling and backfilling operations.
- B. Compaction testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with the following methods:
 - 1. In-place relative density:
 - a. Method: AASHTO T310, Nuclear Method.
 - b. Number of Tests: One (1) per 8-inch vertical lift.
 - 1) Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one (1) test for every 2,000 square feet or less of paved area of building slab, but in no case fewer than three (3) tests.
- C. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contractor's expense.
- D. Acceptance Criteria: The sole criterion for acceptability of in-place fill shall be in situ dry density. Minimum dry density for all fill or backfill shall be 95 percent of the maximum dry density. If a test fails to qualify, the fill shall be further compacted and retested. Subsequent test failures shall be followed by removal and replacement of the material.

3.8 CLEAN UP

- A. Provide and maintain protections or newly filled areas against damage. Upon completion or when directed, correct all damaged and deficient work by building up low spots and remove temporary protections, fencing, shoring and bracing.
- B. Remove all surplus excavated material not required for filling and backfilling and legally dispose of same away from premises.
- C. Leave the premises and work in clean, satisfactory condition, ready to receive subsequent operations.

END OF SECTION

SECTION 312319 – DEWATERING

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes provisions for a dewatering system to continuously lower and control groundwater levels and hydrostatic pressures in order to maintain near-dry conditions for construction of the work as shown on the plans and specified herein.

1.2 SUBMITTALS

- A. Submit the following:
 1. Description: of proposed dewatering system.
 2. Layout: of dewatering system, including location of sumps, deep wells, well points, header pipes, pumps, discharge lines, and observation wells.
 3. Details: of dewatering system, including installation methods for deep wells, well points and observation wells, depths of wells, material descriptions, pipe sizes, intake screen sizes, and pump capacities.
 4. Estimate: of time required to lower groundwater levels after start of pumping

1.3 JOB CONDITIONS

- A. Site soil boring data and samples, soil laboratory testing, and any soil reports shall be made available to prospective bidders for study and review. Bidders must make their own interpretation of subsurface conditions that may affect methods or the cost of construction of the Work.

PART 2 – PRODUCTS

2.1 DEWATERING SYSTEM

- A. Provide a dewatering system of adequate size and capacity to lower and maintain the groundwater at the specified level. The system shall include standby pumps and power source for continuous operation.
 1. Dewatering system shall consist of wellpoints, deep wells, cut-off walls, riser pipes, swing joints, header lines, valves, pumps, discharge lines, and all other necessary fittings, accessories and equipment for a complete operating system. Provide hole punches, sand backfill, and clay plugs as required by soil conditions.
- B. Observation Wellpoints: Provide groundwater reading wells or piezometers to monitor the groundwater level, as indicated on the approved Shop Drawings or as directed by the Engineer.
- C. Sand: Clean concrete sand conforming to ASTM C33.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Install the observation well points at locations indicated on approved Shop Drawings or where directed by the Engineer. Install observation wellpoints in accordance with manufacturer's printed

instructions and in accordance with approved Shop Drawings. Provide sand backfill around wellpoint. Test each observation wellpoint to verify that the installation is performing properly.

- B. Protect observation well standpipes from damage by construction operations and maintain accessibility to them. Maintain reading wells until groundwater is allowed to return to its normal level.

3.2 INSTALLATION

- A. Install the dewatering system in accordance with approved Shop Drawings and as required by site conditions. Locate elements of the system to allow a continuous dewatering operation without interfering with the installation of any permanent project Work.

3.3 OPERATION

- A. Keep the system in continuous operation from the time excavation is started in the dewatering area (or before if required by site conditions to lower the groundwater to the elevations specified) until the time backfilling is completed at least 2 feet above the normal groundwater level.
 - 1. Do not discontinue dewatering operations without specific approval from the Engineer.
 - 2. Rates of groundwater withdrawal during dewatering operations, shall at all times be below the rate at which soil particles are removed from the existing soils.
- B. In the event excavation proceeds subsequent to dewatering as specified above, and the groundwater level is found to be within two feet of the excavation, the dewatering Contractor shall immediately continue to dewater as specified herein, including, but not limited to, additional dewatering and monitoring facilities, at no additional cost to the Owner. The excavation shall not be allowed to proceed below groundwater.

3.4 FIELD CONTROL

- A. Maintain a careful check to detect any settlement in existing adjacent Work. Notify the Engineer of any signs of settlement. Establish settlement point bench marks and take periodic readings as directed. The Contractor shall take all such precautions and do any and all Work necessary to protect the stability and integrity of adjacent lands. Pavements, buildings, and utilities from settlement or other movement that may be caused by his dewatering operations. The Contractor shall be solely responsible for any damage or injury to adjacent lands, pavements, buildings, or utilities caused by his dewatering or other operations or his failure to use corrective or preventive procedures or methods.
- B. Take and record measurements of the groundwater in each reading and pumping well periodically and when directed by the Engineer.

3.5 DISCHARGE

- A. Dispose of all water removed from the excavation in such a manner as not to endanger public health, property, or any portion of the Work under construction or completed.
- B. Dispose of water in such a manner as to cause no inconvenience to others on or adjacent to the site.
- C. Convey water from the excavation in a closed conduit. Do not use trench excavations as temporary drainage ditches.

- D. Disposal of water shall be approved by the Engineer and shall not cause erosion or sedimentation to occur in existing drainage systems. All sedimentation or blocking of existing systems shall be thoroughly cleaned and returned to original condition by the Contractor at his own expense.
- E. Provide approved sediment traps when water is conveyed into water courses.

3.6 REMOVAL

- A. When system is no longer required, gradually decrease the pumping rate until the water table resumes its natural position so that the velocity of the returning groundwater will be low enough as not to carry fines with it.
- B. When the dewatering system is no longer required and when directed by the Engineer, dismantle and remove the system and all appurtenances from the site.

END OF SECTION

SECTION 312333 – TRENCHING AND BACKFILLING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the excavation of trenching, backfilling, compacting, dewatering, excavation support and disposal, as shown on the Contract Drawings, and as herein specified.
- B. The Engineer will determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. The latest edition of the following standards, as referenced herein, shall be applicable.
 - a. "Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering."
 - b. "Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)."
 - c. American Society for Testing and Materials (ASTM).
 - d. National Electric Code (NEC).
- B. The Contractor shall comply with the requirements for soil erosion and sedimentation control and other requirements of governmental authorities having jurisdiction, including the State.
- C. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications in accordance with Section "Quality Requirements."

1.3 SUBMITTALS

- A. Samples:
 - 1. The Contractor shall furnish representative earth materials to the testing laboratory for analysis and report, as directed by the Engineer, or as outlined in the specifications.
- B. Test Results:
 - 1. The testing laboratory shall submit written reports of all tests, investigations, findings, and recommendations to the Contractor and the Engineer.

1.4 PROJECT REQUIREMENTS

- A. Notify the Engineer of any unexpected subsurface condition.
- B. Protect excavations by shoring, bracing, sheet piling, or by other methods, as required to ensure the stability of the excavation. Comply with OSHA requirements.
- C. Underpin or otherwise support structures adjacent to the excavation, which may be damaged by the excavation. This includes service lines.

- D. Protection of Existing Utilities:
 - 1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations. Comply with OSHA requirements.
 - 2. Coordinate interruption and/or termination of utilities with the utility companies and the Owner.
 - 3. Provide a minimum of 48 hours' notice to the Owner and receive written notice to proceed before interrupting any utility.
- E. Demolish and completely remove from the site any existing underground utilities designated to be removed, as shown on the Drawings or as specified.
- F. Repair any damaged utilities as acceptable to the Owner, Engineer, and utility company at no additional cost to the Owner.
- G. Contractor shall comply with maintenance and protection requirements as approved by the authority having jurisdiction.
- H. Protection of Persons and Property:
 - 1. Barricade open excavations occurring as part of this work and post with warning lights, if required.
 - 2. Operate warning lights as recommended by authorities having jurisdiction.
 - 3. Protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - 4. Perform excavation within drip-line of trees to remain by hand and protect the root system from damage or dryout to the greatest extent possible. Maintain moist conditions for root system and cover exposed roots with burlap. Paint cut roots of 1-inch diameter and larger with emulsified asphalt tree paint.

PART 2 – PRODUCTS

2.1 PRECONSTRUCTION MATERIAL QUALIFICATION TESTING

- A. General:
 - 1. Sufficient size samples shall be obtained from the potential borrow source to allow completion of tests listed in paragraph B below. Samples may be obtained from test borings, test pits, or from borrow pit faces provided that surficial dry or wet soil is removed to expose undisturbed earth. Tests listed below shall be performed on each sample obtained. A minimum of 3 representative samples from each potential borrow source shall be furnished to the testing laboratory for prequalification testing. Test data shall be provided to the Engineer a minimum of 2 weeks prior to construction for approval of borrow source. Three test reports completed within three months prior to construction may be submitted for commercial earth borrow sources or suppliers of stone products (crushed stone or graded stone products) in lieu of prequalification tests as approved by the Engineer.
- B. Material Tests:
 - 1. Particle Size Analysis:
 - a. Method: ASTM D422.
 - b. Number of Tests: One (1) per sample; three (3) per potential source.
 - c. Acceptance Criteria: Gradation within specified limits.

2. Maximum Density Determination:
 - a. Method: ASTM D1557 - Modified Proctor.
 - b. Number of Tests: One (1) per sample; three (3) per potential source.
3. Re-establish gradation and maximum density of fill material if source is changed during construction.

2.2 MATERIALS

- A. Pipe Zone Bedding: Select mixture of graded crushed stone, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 703-02 and meeting the following gradation requirements (NYSDOT Size 2):

SIEVE	PERCENT PASSING
1-1/2"	100
1"	90 – 100
1/2"	0 – 15

- B. Pipe Zone Backfill: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 304 and meeting the following gradation requirements (NYSDOT Subbase Type 4):

SIEVE	PERCENT PASSING
2"	100
1/4"	30 – 65
No. 40	5 – 40
No. 200	0 – 10

- C. Suitable Material: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT 203-2.02C and meeting the following gradation requirements:

SIEVE	PERCENT PASSING
4"	100
No. 40	0 – 70
No. 200	0 – 15

1. Run-of-trench material, meeting the above criteria, shall be considered suitable material and shall be used for trench backfill only after tested in accordance with Section "Quality Requirements" and approved by the Engineer. The Contractor shall pay for all additional testing required to determine the conformance of run-of-trench material, if at any time during the Work this material appears to be in non-conformance in the opinion of the Engineer.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Establish required lines, levels, contours, and datum.
- B. Maintain benchmarks and other elevation control points; re-establish if disturbed or destroyed at no additional cost to the Owner.
- C. Establish location and extent of existing utilities prior to commencement of excavation.

3.2 EXCAVATION

- A. All excavation shall be made to such depth as required and of the width shown on the Drawings to provide suitable room for building the structures and laying the pipe(s) they are to contain and for sheeting, shoring, pumping and draining as necessary, and for removing peat, silt, or any other materials which the Engineer may deem unsuitable. Hand trench excavation may be required to protect existing utilities and structures.
- B. Trench excavation for pipes shall be made by open cut to accommodate the pipe or structure at the depths indicated on the Drawings. Excavation shall be made to such a depth and to the width indicated on the Drawings so as to allow a minimum of 8 inches of pipe zone bedding to be placed beneath the bottom of all structures and barrels, bells or couplings of all pipes installed unless otherwise specified on the Drawings.
- C. The bottom of the trench shall be accurately graded to provide a uniform layer of bedding material as required for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections.
- D. Stockpile excavated subsoil for reuse where directed or approved.
- E. Over excavation/undercut: If, in the opinion of the Engineer, existing material below the trench grade is unsuitable for properly placing bedding material and laying pipe, the Contractor shall excavate and remove the unsuitable material and replace the same with an approved pipe zone bedding material properly compacted.
- F. Stability of Excavation: Slope sides of excavations shall comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavation in safe condition until completion of backfilling.
- G. Removal of materials beyond the indicated subgrade elevations, without authorization by the Engineer, shall be classified as unauthorized excavation and shall be performed at no additional cost to the Owner.

3.3 DEWATERING

- A. The Contractor shall remove all water from the excavation promptly and continuously throughout the progress of the work and shall keep the excavation dry at all times until the work is completed and excavation is backfilled or have sufficient weight to resist uplift pressures. Groundwater levels shall be depressed to a minimum of 2 feet below excavation subgrade. No pipe or structure is to be laid in water and water shall not be allowed to rise on or flow over any pipe or structure until such time as approved by the Engineer.
- B. Provide a suitable point of discharge from dewatering operations shall be conveyed in a non-erosive manner satisfactory to the Engineer.
- C. Precautions shall be taken to protect uncompleted work from flooding during storms or from other causes. All pipe lines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

3.4 BEDDING AND BACKFILLING

- A. All pipe trenches backfill (pipe zone bedding, pipe zone backfill and trench backfill) shall be compacted by tamping or rolling to achieve a minimum dry density of 90 percent of the modified

Proctor maximum dry density of the material used (ASTM D1557). Backfill in pipe trenches to be covered with pavement shall be compacted to a minimum of 95 percent of modified Proctor maximum dry density. Backfill materials shall be placed with water content within plus or minus 4 percent of optimum moisture content per the modified Proctor method (ASTM D1557). Any water used for compaction shall be provided by the Contractor at his own expense. The Contractor is responsible for the repair of any trench settlement at no expense to the owner.

- B. Bedding and backfilling shall be accomplished in three stages unless otherwise specified on the Contract Drawings. The first stage shall involve placement of "pipe zone bedding" as a layer(s) of selected material required to support, or to stabilize unsound or unsatisfactory foundation conditions. The second stage shall involve placement of "pipe zone backfill" from the top of the bedding material up to 1 foot above the pipe. The third stage involves the placement of "trench backfill" in the remainder of the trench up to the surface of the ground or the bottom of any special surface treatment subgrade elevation.
- C. The bedding material shall be placed in the trench after the trench has been excavated a minimum of 8 inches below the bell of the pipe to permit the placing of not less than 8 inches of bedding material unless otherwise specified on the Drawings. Where, in the opinion of the Engineer, more than 8 inches of bedding material shall be required, the excavation shall be performed and bedding placed to the depth ordered by the Engineer.
- D. Provide uniform bearing and support for each section of pipe at every point along the entire length except where necessary to excavate for bell holes, pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make the joint connection properly.
- E. The bedding material shall be placed to the full width of trench. The bedding material shall be placed in loose lifts not exceeding 6 inches to the elevation shown on the Drawings or directed by the Engineer. The bedding material shall be tamped and compacted to form a firm and even bearing surface.
- F. Pipe zone backfill shall be placed to the elevation shown on the Drawings in loose lifts not-to-exceed 6 inches in thickness, before compaction. The backfill shall be placed on both sides of the pipe at the same time and to approximately the same elevation. Any pipe that is damaged or moved out of alignment, regardless of cause, shall be replaced or realigned at the Contractor's expense. Each layer shall be thoroughly compacted by hand-tamping or mechanical means being careful not to damage the pipe. When the pipe zone backfill reaches 1 foot over the top of the pipe, the entire surface shall be compacted by mechanical means.
- G. The remainder, if any, of the trench above the pipe zone backfill shall be backfilled with suitable material in loose lifts not exceeding 6 inches in thickness before compaction. Each layer shall be thoroughly compacted by mechanical means.

3.5 BACKFILLING AROUND STRUCTURES

- A. The Contractor shall not place backfill against any structure without obtaining the approval of the Engineer. No dumping shall be allowed where materials would flow against or around such structures. Backfill material shall be deposited in horizontal layers not exceeding 6 inches in loose thickness or as shown on the Drawings and thoroughly compacted by hand or by mechanical means to the satisfaction of the Engineer.

3.6 SUSPENSION OF WORK

- A. Whenever the work is suspended, excavations shall be protected and the roadways, if any, left unobstructed. Within or adjacent to private property, material shall be stored at such locations as will not unduly interfere with traffic of any nature and in no case shall materials be stored in locations which will cause damage to existing improvements.

3.7 DISPOSAL OF MATERIAL

- A. Excess and unsuitable materials shall be disposed of by the Contractor on the site in an area approved by the Engineer or legally disposed of off- site at the Contractor's expense.

3.8 FIELD QUALITY CONTROL

- A. Notify the Engineer at least 3 working days in advance of all phases of filling and backfilling operations.
- B. In-place density testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with the following methods:
 - 1. In-place relative density:
 - a. Method: AASHTO T310, Nuclear Method.
- C. Perform initial density testing to verify that contractors proposed compaction effort will obtain the minimum required densities.
- D. In-place density tests on trench backfills shall be provided for every 500 cubic yards of fill or in vertical lifts not exceeding 2 feet and at least once daily.
- E. One particle size analysis (ASTM D422) and one modified Proctor compaction test (ASTM D1557) shall be completed for every 5,000 cubic yards of material placed.
- F. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contractor's expense.
- G. Acceptance Criteria: The criteria for acceptability of in-place fill shall be in-situ dry density and moisture content. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

END OF SECTION

SECTION 312500 – EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section covers work necessary for stabilization of soil to prevent erosion and sedimentation during and after construction and land disturbing activities. The work shall include the furnishing of all labor, materials, tools, and equipment to perform the work and services necessary as herein specified and as indicated on the Drawings. This shall include installation, maintenance, and final removal of all temporary soil erosion and sediment control measures. All erosion and sediment control methods and devices used shall conform to the latest requirements imposed by federal, state, and local authorities.
- B. Comply with SPDES General Permit GP-0-20-001 for stormwater discharges from construction activities and the Stormwater Pollution Prevention Plan prepared for the project.
- C. The minimum areas requiring soil erosion and sediment control measures are indicated on the Drawings. The right is reserved to modify the use, location, and quantities of soil erosion and sediment control measures based on activities of the Contractor and as the Engineer considers to be the best interest of the Owner.
- D. The Contractor shall be responsible for repair of any damage caused and shall be financially responsible for any penalties imposed.

1.2 QUALITY ASSURANCE

- A. Soil erosion and sediment control measures shall be implemented in accordance with the requirements and procedures outlined in this Specification, Contract Drawings and documents, state standards or guidelines for soil erosion and sediment control, and all regulatory authorities having jurisdiction. Where conflicts between requirements exist, the more restrictive rules shall govern.
- B. The Contractor shall provide all temporary control measures shown on the Drawings, or as directed by the Owner, Owner's representative, or soil conservation district for the duration of the contract. Erosion and sediment control Drawings are intended to be a guide to address the stages of work shown. Additional measures not specified on the Drawings may be necessary and shall be implemented to address intermediary stages of work and any conditions that may develop during construction at no cost to the Owner.
- C. Temporary control provisions shall be coordinated with permanent erosion control features to the extent practical to assure economical, effective, and continuous erosion and sediment control throughout the construction and post-construction period.
- D. Soil erosion and sediment control measures shall at all times be satisfactory to the Owner's Representative. Owner's Representative will inform the Contractor of unsatisfactory construction procedures and operations if observed. If the unsatisfactory construction procedures and operations are not responded to and corrected within 48 hours, the Owner's Representative may suspend the performance of any or all other construction until the unsatisfactory condition has been corrected. Such suspension shall not be the basis of any claim by the Contractor for additional compensation nor for an extension of time to complete the work. Any complaints, fines, etc. relating to ineffective erosion control, shall be the sole responsibility of the Contractor.

- E. The Contractor shall inspect all soil erosion and sediment control measures at least at the beginning and end of each day to ascertain that all devices are functioning properly during construction. Maintenance of all soil erosion and sediment control measures on the project site shall be the responsibility of the Contractor until final stabilization is complete, and until the permanent soil erosion controls are established and in proper working condition.
- F. The Contractor shall protect adjacent properties and watercourses from soil erosion and sediment damage throughout construction.

1.3 GENERAL

- A. Soil erosion stabilization and sediment control measures consist of the following elements:
 - 1. Maintenance of existing permanent or temporary storm drainage piping and channel systems, as necessary.
 - 2. Installation and maintenance of stabilized construction entrance(s).
 - 3. Construction of new permanent and temporary storm drainage piping and channel systems, as necessary.
 - 4. Construction of temporary erosion control facilities such as silt fences, check dams, etc.
 - 5. Topsoil and Seeding: Placement and maintenance of Temporary Seeding on all areas disturbed by construction. Placement of permanent topsoil, fertilizer, and seed, etc., in all areas not occupied by structures or pavement unless shown otherwise.
 - 6. Soil Stabilization Seeding: Placement of fertilizer and seed, etc., in areas as Specified hereinafter.
- B. The Contractor shall be responsible for phasing Work in areas allocated for his exclusive use during this Project, including any proposed stockpile areas, to restrict sediment transport. This will include installation of any temporary erosion control devices, ditches, or other facilities.
- C. The areas set aside for the Contractor's use during the Project may be temporarily developed to provide satisfactory working, staging, and administrative areas for his exclusive use. Preparation of these areas shall be in accordance with other requirements contained within these Specifications and shall be done in a manner to both control all sediment transport away from the area.
- D. Stockpiles remaining in place longer than 14 calendar days shall be considered permanent stockpiles for purposes of erosion and sediment control.
- E. All permanent stockpiles shall be seeded with soil stabilization seed and protected by construction of silt fences completely surrounding stockpiles and located within 10 feet of the toes of the stockpile slopes.
- F. Sediment transport and erosion from working stockpiles shall be controlled and restricted from moving beyond the immediate stockpile area by construction of temporary toe-of-slope ditches and accompanying silt fences as necessary. The Contractor shall keep these temporary facilities in operational condition by regular cleaning, regrading, and maintenance.
- G. The Contractor shall maintain all elements of the Soil Erosion Stabilization and Sedimentation Control systems and facilities to be constructed during this Project for the duration of his activities on this Project.
- H. Formal inspections made jointly by the Contractor and the Engineer shall be conducted every 2 weeks to evaluate the Contractor's conformance to the requirements of these Specifications.

- I. Replacement or repair of failed or overloaded silt fences, check dams, or other temporary erosion control devices shall be accomplished by the Contractor within 24 hours after receiving written notice from the Engineer.
- J. If the Contractor has not complied with any of the above maintenance efforts to the satisfaction of the Engineer within 2 working days after receiving written notification from the Engineer, the Owner shall have the prerogative of engaging others to perform any needed maintenance or cleanup, including removal of accumulated sediment at constructed erosion control facilities, and deduct from the Contractor's monthly partial payment the costs for such efforts in accordance with the General Conditions of the Contract.

1.4 SUBMITTALS

- A. Submittals shall be made in accordance with Section 013300 "Submittal Procedures."
- B. Material Certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds specified requirements.
- C. Results of all tests and investigations, including recommendations.
- D. Submit product data, samples, specifications and manufacturer's installation procedures for approval as directed by Engineer prior to use.

PART 2 – PRODUCTS

2.1 GENERAL

- A. Contractor shall provide all materials necessary to perform the work in accordance with the SWPPP or as shown on the Drawings or specified herein.

2.2 PERMANENT SEED

- A. Refer to Section "Turf and Grasses."

2.3 SOIL STABILIZATION AND TEMPORARY SEED

- A. Temporary Seed: Rye grass, cereal grasses, or other quick growing species suitable to the area as a temporary cover, which will not compete with the grasses specified for permanent cover or as specified in the SWPPP or on the Drawings.

2.4 TOPSOIL

- A. Topsoil shall be as specified under Section "Soil Preparation."

2.5 FERTILIZER

- A. Refer to Section "Turf and Grasses."

2.6 LIME

- A. Ground dolomite limestone not less than 85 percent total carbonates and magnesium, ground so that 50 percent passes through a No. 100 mesh sieve and 90 percent passes a No. 20-mesh sieve. Coarser

material will be acceptable provided the specified rates of application are increased proportionately on the basis of quantities passing the No. 100-mesh sieve.

2.7 STRAW MULCH

- A. Threshed straw of oats, wheat, barley, or rye, free from seed of noxious weeds or clean salt hay.

2.8 EROSION CONTROL BLANKET

- A. Erosion Control Blanket (ECB) shall be constructed with a layer of 70 percent straw and 30 percent coconut fiber stitched with degradable thread between a heavyweight UV stabilized polypropylene top net (3 pounds) and a lightweight photodegradable polypropylene bottom net (1.50 pounds). Both the netting and fiber material shall be green in color. Acceptable products shall include SC150 Double Net Straw-Coconut Blanket as manufactured by North American Green; Curlex Double Net (Curlex II) as manufactured by American Excelsior Company or an approved equal.

2.9 TURF REINFORCEMENT MATS

- A. Permanent Synthetic Turf Reinforcement Mat (TRM) shall be constructed of UV stabilized polypropylene fiber (0.70 pounds per square yard) stitched with permanent polypropylene thread between heavyweight UV stabilized polypropylene top net (5 pounds per 1000 square feet approximate weight) and bottom net (3 pounds per 1000 square feet approximate weight). Both the netting and fiber material shall be green in color.
- B. Acceptable products shall include P300 Permanent Turf Reinforcement Mat as manufactured by North American Green; Recyclex TRM by American Excelsior Company or an approved equal.

2.10 HAY BALE

- A. Bales shall be tightly bound, staked with 1 inch by 1 inch hardwood stakes. Hay shall be from mowings of acceptable herbaceous growth free from noxious weeds.

2.11 STONE CHECK DAM

- A. The gradation of stone check dam material identified on the plans shall meet the following requirements:

NCSA ROCK SIZE*	PERCENT PASSING BY WEIGHT
12"	100
6"	15 – 50
3"	0 – 15

*National Crushed Stone Association

- B. Geotextile fabric for stone check dam shall meet the requirements non-woven fabric found in Section "Geotextiles."

2.12 SILT FENCE

- A. Silt Fence (SF) shall consist of woven geotextile fabric, posts, wire mesh backing, and fasteners meeting the requirements shown on the Drawings.
- B. The woven geotextile fabric shall meet the following specifications.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs.)	110	ASTM D 4632
Elongation at Failure (%)	20	ASTM D 4632
Mullen Burst Strength (PSI)	300	ASTM D 3786
Puncture Strength (lbs)	60	ASTM D 4833
Minimum Trapezoidal Tear Strength (lbs)	50	ASTM D 4533
Flow Through Rate (gal/min/sf)	25	ASTM D 4491
Equivalent Opening Size	40-80	ASTM D 4751
Minimum UV Residual (%)	70	ASTM D 4355

2.13 COMPOST FILTER SOCK

- A. Compost infill shall consist of decomposed (matured at least 3 months), weed-free, organic material that is aerobically composted, possess no odors, and contain less than 1%, by dry weight, of man-made material. The compost infill should meet the following specifications. All biosolids compost produced in New York State must meet NYS DEC's 6 NYCRR Part 360 (Solid Waste Management Facilities) requirements or more stringent than 40 CFR Part 503 to ensure safe standards for pathogen reduction and heavy metal content.

Organic Matter Content	25% - 100% (dry weight)
Organic Portion	Fibrous and elongated
pH	6.0 – 8.0
Moisture Content	30% - 60%
Particle Size	100% passing a 1" screen and 10-50% passing a 3/8" screen
Soluble Salt Concentration	5.0 dS/m (mmhos/cm) maximum

- B. Compost filter sock fabric material shall meet the minimum requirements and specifications listed in the following tables.

Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
Material Characteristics	Photodegradable	Photodegradable	Biodegradable	Photodegradable	Photodegradable
Sock Diameters	12",18"	12", 18",24", 32"	12", 18",24", 32"	12", 18",24", 32"	12", 18",24", 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years

2.14 MANUFACTURED INSERT INLET PROTECTION

- A. The sack structure shall consist of woven geotextile fabric equal to or exceeding the performance standard for the silt fence fabric.

PART 3 – EXECUTION

3.1 GENERAL

- A. The Contractor shall comply with and implement the Stormwater Pollution Plan provided in the contract documents.
- B. Review the soil erosion and sediment control Drawings as they apply to current conditions. Any deviation from the Drawings must be submitted for approval to the site Engineer in writing at least 72 hours prior to commencing that work.
- C. Initial soil sediment and erosion control devices shall be in place prior to any land disturbing activity in their proper sequence and maintained until permanent protection is established.
- D. The limit of the area of any earthwork operations in progress shall be commensurate with the Contractor's capability and progress in keeping the finished grading, mulching, seeding, and other such permanent control measures current and in accordance with the accepted schedule for construction phasing. Should seasonal limitations make such coordination unrealistic, as determined by the Owner's Representative, temporary erosion control measures shall be provided immediately by the Contractor at no expense of the Owner.
- E. Temporary erosion control measures shall be used to correct conditions which develop during construction that are needed prior to installation of permanent control features, or that are temporarily needed to control erosion that develops during normal construction practices but are not associated with permanent control features on the project.
- F. The Contractor shall incorporate all permanent erosion control features (stabilization) into the project at the earliest practical time to minimize the need for temporary controls.
- G. A stabilized construction entrance (SCE) shall be installed and maintained at any point where construction vehicles enter a public right-to-way, street, or parking area. The SCE shall be used to eliminate mud from the construction area onto public right-of-way. The SCE shall be constructed as shown on the Drawings. Any mud or debris tracked on streets shall be cleaned up immediately.
- H. Dust Control: The Contractor shall provide a commercial grade; enclosed broom mechanical street sweeper to control sediment and/or dust that is tracked on to the adjacent streets. The street sweeper shall be equipped with a water storage tank to wet the area prior to sweeping. Where on site controls do not prevent material from being tracked on to adjacent streets, the street sweeper shall be used to clean the adjacent streets immediately. In addition, at a minimum, the adjacent streets shall be swept at the end of each day or as directed by the Engineer.
- I. Any disturbed or stockpiled areas that will be left exposed more than 14 days or less according to State NPDES General Stormwater Permits shall immediately receive temporary or permanent seeding. Mulch/straw shall be used if the season prevents the establishment of a temporary cover. Disturbed areas shall be limed and fertilized prior to temporary seeding.
- J. Permanent vegetation shall be established as specified on all exposed areas within 7 days or less according to State NPDES General Stormwater Permits after final grading. Mulch as necessary for seed protection and establishment. Lime and fertilize seedbed prior to permanent seeding.
- K. Slopes shall be permanently seeded and mulched. Any slopes that erode easily shall be temporarily seeded and mulched. Any slopes deeper than 3:1 or steeper or as indicated on Drawings shall be protected with Erosion Control Blanket per specifications.

- L. All storm drainage outlets must be stabilized, as specified, before the discharge points become operational. Equip all inlets with inlet protection immediately upon construction.
- M. Manufactured insert inlet protection shall be installed and anchored in accordance with the manufacturers recommendations and design details. The Contractor shall maintain all manufactured insert inlet protection units until the project is stabilized and shall remove and dispose of the sediment accumulation properly when the units are more than 1/3 full. Replace and reinstall the unit if necessary.
- N. Discharge from dewatering operations for the excavated areas shall not be directed to surface waters without first properly removing the suspended sediment through filtration and/or settlement. The Contractor shall obtain any required permits associated with dewatering activities.
- O. Silt fence shall be installed at locations on the Drawings and any additional locations necessary for proper sediment control. The Contractor shall maintain the silt fence until the project is stabilized and shall remove and dispose of the silt fence and silt accumulation when 1/3 the height of the fence is reached.
- P. Filter Socks shall be place at locations indicated on plans or as directed by the Engineer. They should be installed parallel to the base of the slope or other affected area. The Contractor shall maintain the Filter Socks and they shall be inspected weekly and after each rain event. If the Filter Sock requires repair, it shall be repaired in accordance with the manufacture's recommendations or replaced within 24 hours of inspection notification. Biodegradable filter socks shall be replaced after 6 months; photodegradable filter socks after 1 year. Polypropylene socks shall be replaced according to the manufacturer's recommendations.
- Q. Soil erosion and sediment control shall include but not be limited to the approved measures. The Contractor shall be responsible for providing all additional measures that may be necessary to accomplish the intent of the Drawings.
- R. Comply with all other requirements of authorities having jurisdiction.
- S. Soil Stabilization and Temporary Seeding:
 - 1. Soil stabilization seeding shall consist of the application of the following materials in quantities as further described herein for stockpiles and disturbed areas left inactive for more than 14 days.
 - a. Lime.
 - b. Fertilizer.
 - c. Seed.
 - d. Mulch.
 - e. Maintenance.
 - 2. Hydroseeding will be permitted as an alternative method of applying seed and associated soil conditioning agents described above. Should the Contractor elect to apply soil stabilization seeding by hydroseeding methods, he shall submit his operational plan and methods to the Engineer.
 - 3. Temporary Seeding is to be placed and maintained over all disturbed areas prior to Permanent Seeding. Maintain Temporary Seeding until such time as areas are approved for Permanent Seeding. As a minimum, maintenance shall include the following:
 - a. Fix-up and reseedling of bare areas or re-disturbed areas.
 - b. Mowing for stands of grass or weeds exceeding 6 inches in height.

- T. Topsoil and Permanent Seeding: conform to the requirements of Section "Soil Preparation" and Section "Turf and Grasses."

END OF SECTION

SECTION 321116 – SUBBASE COURSES

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes provisions for prepared subbase courses for under walks and pavements.
- B. Proof rolling of subgrade for walks and pavements is included in this Section.
- C. Replacement of unsuitable subgrade materials is included in another Section.
- D. Final grading of pavement subbase is specified in this Section.
- E. Stabilization fabric is included in another Section.

1.2 REFERENCES

- A. The latest edition of the following standards, as referenced herein, shall be applicable:
 - 1. Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering.
 - 2. Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO).
 - 3. American Society for Testing and Materials (ASTM).

1.3 SUBMITTALS

- A. Source Quality Control Test Reports: Submit test reports directly to Engineer from the testing agency with copy to Contractor.
- B. Field Testing Reports: Submit results of field testing directly to Engineer with copy to Contractor. Reference testing location to plan, and cross-reference to all retesting required to accept installed subbase material.
 - 1. Note action taken next to all sub-standard test results.

1.4 QUALITY ASSURANCE

- A. Testing Laboratory Qualifications: To qualify for acceptance, the soil testing laboratory must demonstrate to Engineer's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E699, that it has the experience and capability to conduct the required testing without delaying the progress of the Work.
- B. Field Testing and Inspection Service: Contractor shall retain the services of the same independent soil testing laboratory used for source qualification testing to provide soil testing during pavement subbase installation.

PART 2 – PRODUCTS

2.1 SOURCE QUALIFICATION TESTING

- A. Contractor shall employ and pay for a qualified independent soil testing laboratory to perform soil testing services for source qualification.

1. Obtain a 100-pound minimum representative sample from each potential aggregate source. Obtain samples for each different material gradation known to exist in the pit. Mix each sample thoroughly in accordance with AASHTO T87 and submit to the testing laboratory for reduction to specimen size. The laboratory shall perform the following tests in the order shown. Each material shall pass all tests in order to qualify.
 - a. Particle Size Analysis:
 - 1) Method: ASTM D422.
 - 2) Number of Tests: 2 per potential source.
 - 3) Acceptance Criteria: Gradation within specified limits.
 - b. Plasticity Index Determination:
 - 1) Method: ASTM D424.
 - 2) Number of Tests: 1 particle size analysis on material passing no 40 mesh.
 - 3) Acceptance Criteria: Plasticity Index within specified limits.
 - c. Maximum Density Determination:
 - 1) Method: ASTM D1557 Modified Proctor.
 - 2) Number of Tests: 2 per potential source.
 - d. Magnesium Sulfate Soundness Loss Test:
 - 1) Method: NYSDOT Standard Test Method **11**.
 - 2) Number of Tests: 2 per potential source.
 - 3) Acceptance Criteria: 4 cycle loss within specified limits.
2. Re-establish subbase material properties if source is changed during construction.

2.2 MATERIALS

- A. Processed Gravel Subbase Course: Materials shall consist of sound, durable blast furnace slag, stone, sand, gravel or blends of these materials.
- B. Crushed Rock Subbase Course: Materials shall consist solely of approved blast furnace slag or stone which is the product of crushing ledge rock (NYSDOT Type 2).
- C. All materials shall be well graded from course to fine and free from organic or other deleterious materials, conforming to the requirements of NYSDOT Section 304, and meeting the following gradation requirements:

TYPE	SIEVE	PERCENT PASSING
2	2"	100
	1/4"	25-60
	No. 40	5-40
	No. 200	0-10

1. Magnesium Sulfate soundness loss after 4 cycles shall be less than 20 percent.
2. Plasticity Index of material passing No. 40 sieve shall not exceed 5.0.
3. Not more than 30 percent, by weight, of the particles retained on a 1/2-inch sieve shall consist of flat or elongated particles. A flat or elongated particle is defined as one which has its greatest dimension more than 3 times its least dimension.
4. All material shall meet the specified gradation prior to placement. All processing shall be completed at the source.
5. Stabilization Fabric: Conform to Section "Geotextiles."

PART 3 – EXECUTION

3.1 PREPARATION

- A. Establish required lines, levels, contours, and datum.
- B. Maintain benchmarks and other elevation control points. Re-establish, if disturbed or destroyed, at no additional cost to Owner.
- C. Proof-roll existing subgrade to the satisfaction of the Engineer. Should the subbase course become unstable at any time prior to the placement of the overlying course(s), correct the unstable condition to the satisfaction of the Engineer. Replace unstable or weak subgrade materials with suitable material as provided in the Specifications.
- D. Place stabilization fabric in locations as directed on the plans and in accordance with Section "Geotextiles" after subgrade has been proof-rolled and accepted by the Engineer.

3.2 INSTALLATION

- A. Place subbase material in uniform horizontal layers, with a maximum compacted thickness of 12 inches.
- B. Place subbase in a manner to avoid segregation. Uncontrolled spreading shall not be permitted.

3.3 COMPACTION

- A. Where subbase courses must be moisture-conditioned before compaction, uniformly apply water to the surface. Prevent free water from appearing on the surface during or subsequent to compaction operations.
- B. Compact all portions of each layer to a density not less than 95 percent of the maximum density.
- C. Final tolerances for the top surface of the subbase course requires that the surface does not extend more than 1/4 inch above nor more than 1/4 inch below the specified grade at any location.

3.4 TRAFFIC ON SUBBASE

- A. The movement of vehicular traffic over the final surface of the subbase may be permitted at locations designated by, and under such restrictions as ordered by the Engineer, provided such movements take place prior to the final finishing of this course to the specified tolerance. The movement of construction equipment on this course may be permitted, at locations designated by and under such restrictions as ordered by the Engineer at locations where permission is granted for such movement, the temporary surface of the course upon which the construction traffic is running, shall be placed and maintained for at least 2 inches above the final surface of this course. Just prior to paving, and after all construction traffic not required for the removal has ceased, remove the 2-inch protective layer, prepare the exposed surface of the course, and compact to the specified tolerance.
- B. Should the subbase become mixed with the subgrade or any other material, through any cause whatsoever, remove such mixture and replace it with the specified subbase material.

3.5 FIELD QUALITY CONTROL

- A. Notify the Engineer at least 1 working day in advance of all phases of subbase installation.

- B. Comply with the requirements of this Section for in-place relative density testing.
1. In-place relative density:
 - a. Method: AASHTO T310, Nuclear Method.
 - b. Number of Tests: 1 per specified interval.
 2. Compaction tests shall be provided for every 1000 square yard of subbase placement. A minimum of 3 for each lift is required.
 3. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions.
 4. Acceptance Criteria: The sole criterion for acceptability of in-place subbase shall be in situ dry density. Minimum dry density for all subbase shall be 95 percent of the maximum dry density. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

END OF SECTION

SECTION 321216 – ASPHALT PAVING

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes provisions for hot-mixed asphalt paving over prepared subbase.
- B. This section includes provisions for replacing pavement removed during the course of the Work, or damaged resulting from Contractor's operations.

1.2 REFERENCES

- A. The latest edition of the following standards, as referenced herein, shall be applicable:
 - 1. State Specific Department of Transportation Standards.
 - 2. Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO).
 - 3. American Society for Testing and Materials (ASTM).

1.3 SUBMITTALS

- A. Material Certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds specified requirements.
- B. Field Test Reports: Submit results of field testing directly to the Engineer.

1.4 SITE CONDITIONS

- A. Weather Limitations: Apply tack coats when ambient temperature is above 50 DegF (10 DegC) and when temperature has not been below 35 DegF (1 DegC) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- B. Construct hot-mixed asphalt concrete surface course when atmospheric temperature is above 40 DegF (4 DegC) and when base is dry. Base course may be placed when air temperature is above 30 DegF (minus 1 DegC) and rising.
- C. Grade Control: Establish and maintain required lines and elevations.
- D. In no instance shall the materials and thicknesses of pavement and subbase courses replaced be less than that removed, unless approved by the Engineer.

1.5 SEQUENCING AND SCHEDULING

- A. Coordinate the placement of asphalt concrete pavement with the completion of underground work by other trades.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. General: Asphalt concrete and all related items shall meet the requirements of NYSDOT.

- B. Binder Course:
 - 1. NYSDOT Hot Mix Asphalt 19mm Nominal Maximum Size.
- C. Top Course:
 - 1. NYSDOT Hot Mix Asphalt 12.5mm Nominal Maximum Size, (PG 70-28).
- D. Tack Coat:
 - 1. Emulsified asphalt, ASTM D977.

PART 3 – EXECUTION

3.1 SURFACE PREPARATION

- A. General: Remove loose material from compacted subbase surface immediately before commencing paving operations.
- B. Proof-roll prepared subbase surface with a 10-ton static, steel-wheel roller to check for unstable areas and areas requiring additional compaction, witnessed by the Engineer at least 48 hours prior to scheduled paving operations.
- C. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.
- D. Sawcut edges of existing pavement to achieve straight line transitions between old and new pavement. Make a second sawcut through the top course of existing pavement, 18 inches from the first cut to provide a staggered joint.
- E. Tack Coat: Apply to contact surfaces of previously constructed asphalt or Portland cement concrete and surfaces abutting or projecting into asphalt concrete pavement. Distribute at rate of 0.03 to 0.07 gallons per square yard of surface.
- F. Allow to dry until at proper condition to receive paving.
- G. Exercise care in applying bituminous materials to avoid smearing of adjoining surfaces. Remove and clean damaged surfaces.
- H. Do not commence pavement replacement operations until all buried work beneath pavement repair has been completed to the satisfaction of the Engineer.
- I. Where trench dimensions preclude the use of proof rolling equipment, demonstrate the stability of the subgrade and subbase through other means, as acceptable to the Engineer.

3.2 PLACING AND COMPACTING MIX

- A. General: Place and compact asphalt pavement courses in accordance with NYSDOT unless otherwise specified.
- B. Place inaccessible and small areas by hand, and compact with hot hand tampers or vibrating plate compactors.
- C. Chamfer edges of walks at 45-degree angle where walks do not abut curb.

- D. Joints: Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of asphalt concrete course. Clean contact surfaces and apply tack coat.
- E. Place tack coat between successive courses if more than 48 hours have elapsed after placing the preceding course. Apply tack coat at a rate of 0.03 to 0.07 gallons per square yard of surface.
- F. Compaction: Compact asphalt pavement courses with a static steel wheel roller only, unless otherwise approved by the Engineer, based upon work conditions.
- G. Remove and patch areas of any asphalt concrete course deemed unsatisfactory by the Engineer, at the Contractor's expense. Remove hardened or set asphalt by saw cutting.
- H. Adhere to NYSDOT compaction requirements. This, however, shall not relieve the Contractor of his responsibility to provide a well densified pavement. It shall be the Contractor's obligation to recognize difficulties in compacting the mix, and to make appropriate corrections.
- I. Roll and compact the asphalt concrete course until the finished surface is free from depressions, waves or other defects that would prevent proper drainage. The finished surface shall be uniform in texture and appearance.
- J. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- K. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.
- L. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D2950 and correlated with ASTM D1188 or ASTM D2726.
 - 1. Replace and compact hot-mix asphalt where core tests were taken.
 - 2. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.3 FIELD QUALITY CONTROL

- A. General: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by Engineer.
- B. Thickness: In-place compacted thickness tested in accordance with ASTM D3549 will not be acceptable if exceeding following allowable variations:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Binder and Surface Course: Plus or minus 1/4 inch.
 - 3. Cumulative Thickness Tolerances: Plus or minus 1/4 inch for nominal cumulative thicknesses less than or equal to 4 inches. Plus or minus 1/2 inch for nominal cumulative thicknesses greater than 4 inches.
- C. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10-foot straightedge applied parallel with and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:
 - 1. Base and Binder Course Surfaces: 1/4 inch.
 - 2. Wearing Course Surface: 3/16 inch.

3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.
- D. Compaction:
1. Compaction shall be achieved utilizing NYSDOT Part 404-3 and Table 404-3 for density achieved through specified roller passes.
- E. Check surface areas at intervals as directed by Engineer.
- F. Scuff Resistance: If, in the opinion of the Engineer, the pavement does not demonstrate reasonable resistance to deformation by punching loads and scuffing under horizontally applied shearing loads, after the pavement has cooled and hardened, the Engineer may require laboratory testing of cored pavement samples to determine the properties of the pavement; including aggregate gradation, asphalt content, air void ratio, density and any others deemed appropriate. If laboratory testing indicates that any parameters substantially deviate from the design mix tolerances specified by Maine DOT, replace the affected areas of pavement at no additional cost, and reimburse the Owner for all costs incurred in procurement and testing of cores.

END OF SECTION

SECTION 321313 – CONCRETE PAVING

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes provisions for the placement of Portland cement concrete pavement.
- B. Place Portland cement concrete pavement in conformance with the lines, grades, thicknesses, and typical sections shown or detailed on the Drawings.

1.2 REFERENCES

- A. Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering.
- B. Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO).

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Qualification Data: For Installer.
- D. Testing Agency Qualifications:
- E. Material Test Reports: Indicating compliance with requirements.

1.4 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. The latest edition of the following standards, as referenced herein shall be applicable:
 - a. Standard Specifications, New York State Department of Transportation.
 - b. American Society of Testing and Materials (ASTM).
 - c. American Concrete Institute (ACI).
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, qualified according to ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specifications for Structural Concrete,"
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- E. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests.

1.5 PROJECT REQUIREMENTS

- A. Coordinate the placement of Portland cement concrete pavement with the completion of underground work by other trades.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Conform with Section "Subbase Courses" for subbase course.
- B. Concrete:
1. 28-Day Compressive Strength: 4000 psi (minimum).
 2. Water to Cement Ratio: 0.45 (maximum).
 3. Air Entrainment: 4 to 8 percent.
 4. Slump: 1 to 3 inches.
- C. Formwork:
1. Do not use earthcuts for vertical surfaces.
 2. All forms shall be built mortar tight and of materials sufficient in strength to hold concrete without bulging between supports. Forms shall be maintained to eliminate the formation of joints due to shrinkage of the forms. Concrete, misshapen by bulges or deformations caused by inadequate forms, shall be removed or corrected as ordered by the Engineer. All replacements or corrections shall be made at the Contractor's expense.
 3. All surfaces of wooden forms that will be in contact with exposed concrete shall be thoroughly treated with an approved lacquer in the procedure recommended by the manufacturer. Forms so treated shall be protected from being damaged or dirtied prior to placing of the concrete.
 4. Metal forms shall be treated with an approved form lacquer or may be treated with an approved form oil. The metal used for forms shall be of sufficient thickness to remain true to shape. All bolt and rivet heads shall be designed to hold the forms rigidly together and to allow removal, without injury to the concrete. Metal forms which do not have smooth surfaces, correct alignment and clean surfaces shall not be used.
- D. Steel Reinforcement:
1. Reinforcing Bars: ASTM A615, Grade 60.
 2. Plain Steel Welded Wire Reinforcement: ASTM A185, plain, fabricated from as-drawn steel wire into flat sheets.

- E. Joint and Curb Ties:
 - 1. Conform to the Details shown on the Drawings.
- F. Curing Compound:
 - 1. Uncolored Concrete: Resin-base, white pigmented compound conforming to ASTM C309, Type 2.
 - 2. Colored Concrete: Clear waterborne curing compound conforming to ASTM C309, Type 1.
- G. Joint Sealant:
 - 1. An elastic, one component, self-leveling, premium grade polyurethane sealant conforming to ASTM C920, Type 5, Grade P, Class 25, Use T₁.
 - 2. Manufactured by W.R. Meadows, Sika Corporation, Euclid Chemical Co., or approved equal.
 - 3. Color: Selected by Engineer. Submit standard manufacturers color chart.
- H. Joint Bond Breaker:
 - 1. 3/8-inch diameter polyethylene foam rod.
- I. Premolded Joint Filler:
 - 1. ASTM D1751 or ASTM D1752.

PART 3 – EXECUTION

3.1 GENERAL

- A. Concrete pavement shall not be applied when the air temperature is below 40 DegF or above 95 DegF unless otherwise directed or when weather conditions would prevent proper construction.
- B. All application equipment, methods, and installation shall conform to MASSDOT requirements.

3.2 PREPARATION

- A. The subbase shall be placed and compacted true to line and grade as shown on the Drawings and conforming to Section “Subbase Courses.”
- B. Proof roll prepared subbase surface with a 10-ton static steel wheel roller to check for unstable or otherwise unsuitable areas as determined by the Engineer. Replace and recompact all unsatisfactory areas, as approved by the Engineer, prior to commencement of paving operations.
- C. Notify the Engineer 48 hours prior to commencing placement of concrete.
- D. Moisten base to minimize absorption of water from fresh concrete.

3.3 CONCRETE PLACEMENT

- A. All foreign matter of any kind shall be removed from the interior of forms before placement of the concrete. Temporary struts or braces within the forms shall be removed when concrete has reached an elevation rendering their further service unnecessary.
- B. Concrete shall be rejected which does not reach its final position in the forms within 60 minutes after water is first added to the mix.

- C. Concrete shall be placed so as to avoid segregation of the materials and displacement of the reinforcement. Long troughs, chutes and pipes for placing or conveying concrete may be used only on written authorization of the Engineer, and he may also order their discontinuance, if inferior quality of concrete is produced.
- D. Dropping the concrete a distance of more than 3 feet or depositing a large quantity at any point and running or working it along the forms will not be permitted.
- E. Concrete shall be compacted by continuous working with a suitable tool in a manner acceptable to the Engineer. All thin section work shall be thoroughly worked with a steel slicing rod.
- F. Concrete shall be placed in horizontal layers not more than 12 inches thick except as hereinafter provided. When less than a complete layer is placed in one operation, it shall be terminated in a vertical bulkhead. Each layer shall be placed and compacted before the preceding batch has taken its initial set to prevent injury to the concrete and avoid cold joints between the batches. Each layer shall be compacted so as to avoid the formation of a joint with a preceding layer, which has not taken initial set.
- G. Construction joints shall be placed only where shown on the plans or as permitted by the Engineer.
- H. Concrete shall be thoroughly compacted during and immediately after depositing by vibrating the concrete internally by means of mechanical vibrating equipment.
 - 1. Lateral transport of the concrete by means of vibrating equipment will not be allowed.

3.4 FINISH

- A. After placement the concrete shall be smoothed with an approved mechanical or hand screed.
- B. Edge rounding shall not exceed 1/4 inch and surface irregularities shall not exceed 1/8 inch in 10 feet.
- C. Texturing:
 - 1. Immediately after smoothing operations have been completed and prior to application of curing compound, the surface of the concrete shall be textured with a set of spring steel tines in a direction perpendicular to the center line of pavement.
 - 2. The individual tines shall be rectangular in shape, 3/16 inch wide, 1/32 inch thick, and approximately 6 inches long. The center to center spacing of the tines shall be approximately 3/4 inch. They shall be capable of producing striations generally not less than 3/16 inch deep in the plastic concrete in the one pass.
 - 3. More than one pass over the same area will not be permitted unless the surface has first been refinished. The capability of the tines to provide an acceptable texture shall be demonstrated to the Engineer prior to approval for use.
 - 4. The tine head may be operated by hand or mechanically. In either case, concrete texturing shall take place with the longitudinal axis of the tines as nearly at an angle of 45 degrees to the concrete surface as is practicable to eliminate the dragging of mortar by the tines. The tines shall be kept free of hardened concrete particles.

3.5 CURING

- A. Cure using an approved method as given in New York State DOT requirements.

3.6 REMOVAL OF FORMWORK

- A. Forms will remain in place at least 12 hours after the placing of the concrete. This duration may be lengthened if, in the opinion of the Engineer, conditions warrant.

3.7 JOINTS

- A. Longitudinal and transverse joints shall be constructed as indicated on the Plans and in accordance with these requirements. All joints shall be constructed true to line with their faces perpendicular to the surface of the pavement. Joints shall not vary more than 1/4 inch from a true line or from their designated position. The surface across the joints shall be tested with a 10-foot straight edge as the joints are finished and any irregularities in excess of 1/8 inch shall be corrected before the concrete has hardened.
- B. Transverse joints shall be at right angles to the center line of the pavement and shall extend the full width of the panel. The transverse joints in succeeding lanes shall be placed in line with similar joints in the first lane.
- C. All joints shall be so prepared, finished, or cut to provide a groove of sufficient width and depth to receive and effectively retain joint- sealing material.
- D. When joints in concrete pavements are sawed, the joints shall be cut at the time and in the manner approved by the Engineer. The circular cutter shall be capable of cutting in a straight line, and shall produce a slot at least 5/16 inch wide. When shown on the Plans or required by the Specifications, the top portion of the slot or groove shall be widened by means of a second cut or by suitable and approved leveling to provide adequate space for joint sealers. Sawing of the joints shall commence as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling, or tearing. The joints shall be sawed at the required spacing consecutively in sequence of the concrete placement, unless otherwise approved by the Engineer.

3.8 SURFACE SEALANT

- A. Apply surface sealant in accordance with manufacturer' instructions.

3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each 10 cubic yards or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 DegF and below and when 80 DegF and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C31/C31M.
 - a. Cast and laboratory cure three sets of two standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C39/C39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days. The remaining two cylinders will be held in reserve. If the results of the 28-day tests indicate low strength concrete, the Engineer will direct the Contractor and laboratory to test the remaining two cylinders at a time directed by the Engineer.
7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
8. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

END OF SECTION

SECTION 321400 – CRUSHED STONE SURFACING

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes the placement of crushed stone pavement.
- B. Place crushed stone pavement in conformance with the lines, grades, thicknesses and typical sections as shown or detailed on the Drawings.

1.2 REFERENCES

- A. "Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering."
- B. "Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)."
- C. "American Society for Testing and Materials (ASTM)."

1.3 SUBMITTALS

- A. Samples:
 - 1. The Contractor shall furnish earth materials to the testing laboratory for analysis and report, as directed by the Engineer, or as outlined in the specifications.
- B. Test Reports:
 - 1. The testing laboratory shall submit written reports of all tests, investigations, findings, and recommendations to the Contractor and the Engineer.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. The stone base shall meet the following gradation and is subject to the Engineer's approval:
 - 1. #57 Stone:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
1-1/2"	100
1"	90-100
1/2"	26 – 60
No. 4	0-7
No. 8	0-3

- B. The topping stone must meet the following gradation for No. 89 Stone:

Sieve Size	% Passing
1/2"	100
3/8"	90-100
No. 4	20-55
No. 8	0-15
No. 16	0-10
No. 50	0-5

- C. All stone shall be angular. Rounded or river stone is not acceptable.
- D. It shall be the Contractor's responsibility to provide a material which meets this specification and is within his capabilities to fine grade to the required tolerances. Should the subbase course become unstable at any time prior to the placement of the overlying course due to the gradation of the material furnished, the Contractor shall, at his own expense, correct the unstable condition to the satisfaction of the Engineer.
- E. All material shall meet the specified gradation prior to placement. All processing shall be completed at the source.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Establish required lines, levels, contours, and datum.
- B. Maintain benchmarks and other elevation control points. Re-establish, if disturbed or destroyed at no additional cost to the Owner.
- C. Place subbase only after subgrade has been proof-rolled and approved by the Engineer. Unstable or weak subgrade materials shall be replaced with suitable material at the Contractor's expense.

3.2 PLACING

- A. Place soil stabilization fabric in accordance with Section "Stabilization Fabric," if required by the Drawings or otherwise specified.
- B. All subbase material shall be placed in uniform horizontal layers with a maximum compacted thickness of 12 inches.
- C. Place the subbase in a manner to avoid segregation. Uncontrolled spreading shall not be permitted.

3.3 COMPACTION

- A. Where subbase courses must be moisture-conditioned before compaction, uniformly apply water to the surface. Prevent free water from appearing on the surface during, or subsequent to, compaction operations.

- B. All portions of each layer shall be compacted to a density not less than 100 percent of the maximum density.
- C. After compaction, the top surface of the subbase course shall not extend more than 1/4 inch above nor more than 1/4 inch below the specified grade at any location.

3.4 TRAFFIC ON SUBBASE

- A. The movement of highway traffic over the final surface of the subbase may be permitted at locations designated by, and under such restrictions as ordered by the Engineer, provided such movements take place prior to the final finishing of this course to the specified tolerance. The movement of construction equipment on this course may be permitted, at locations designated by and under such restrictions, as ordered by the Engineer. At locations where permission is granted for such movement, the temporary surface of the course, upon which the construction traffic is running, shall be placed and maintained at least 2 inches above the final surface of the course. Just prior to paving and after all construction traffic, not required for the removal, has ceased, the 2 inch protective layer shall be removed, and the exposed surface of the course prepared and compacted to the specified tolerance.
- B. Should the subbase become mixed with the subgrade or any other material, through any cause whatsoever, the Contractor shall, at his expense, remove such mixture and replace it with the appropriate subbase material.

3.5 FIELD QUALITY CONTROL

- A. Notify the Engineer at least one (1) working day in advance of all phases of filling and backfilling operations.
- B. Compaction testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with Section "Quality Requirements."
- C. Compaction tests shall be provided for every 250 cubic yards of fill for each lift.
- D. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contractor's expense.
- E. Acceptance Criteria: The sole criterion for acceptability of in-place subbase shall be in situ dry density. Minimum dry density for all subbase shall be 100 percent of the maximum dry density. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

END OF SECTION

SECTION 321500 – CRUSHED STONE SURFACING

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes the placement of decomposed granite.
- B. Place decomposed granite in conformance with the lines, grades, thicknesses and typical sections as shown or detailed on the Drawings.

1.2 REFERENCES

- A. "Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering."
- B. "Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)."
- C. "American Society for Testing and Materials (ASTM)."

1.3 SUBMITTALS

- A. Samples:
 - 1. The Contractor shall furnish earth materials to the testing laboratory for analysis and report, as directed by the Engineer, or as outlined in the specifications.
- B. Test Reports:
 - 1. The testing laboratory shall submit written reports of all tests, investigations, findings, and recommendations to the Contractor and the Engineer.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Decomposed Granite: Sound, durable stone, well-graded from coarse to fine and free from organic or other deleterious materials, conforming to the following gradation requirements:

SIEVE	PERCENT PASSING
1/2"	100
3/8"	95-100
No. 4	85-90
No. 8	75-85
No. 16	55-70
No. 30	40-60
No. 50	25-35
No. 100	15-25
No. 200	10-20
Pan	0-10

1. Source:
 - a. Troy Sand and Gravel, Inc.
 - b. Approved equivalent
- B. It shall be the Contractor's responsibility to provide a material which meets this specification and is within his capabilities to fine grade to the required tolerances. Should the subbase course become unstable at any time prior to the placement of the overlying course due to the gradation of the material furnished, the Contractor shall, at his own expense, correct the unstable condition to the satisfaction of the Engineer.
- C. All material shall meet the specified gradation prior to placement. All processing shall be completed at the source.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Establish required lines, levels, contours, and datum.
- B. Maintain benchmarks and other elevation control points. Re-establish, if disturbed or destroyed at no additional cost to the Owner.
- C. Place subbase only after subgrade has been proof-rolled and approved by the Engineer. Unstable or weak subgrade materials shall be replaced with suitable material at the Contractor's expense.

3.2 PLACING

- A. Place soil stabilization fabric in accordance with Section "Stabilization Fabric," if required by the Drawings or otherwise specified.
- B. All subbase material shall be placed in uniform horizontal layers with a maximum compacted thickness of 12 inches.
- C. Place the subbase in a manner to avoid segregation. Uncontrolled spreading shall not be permitted.

3.3 COMPACTION

- A. Where subbase courses must be moisture-conditioned before compaction, uniformly apply water to the surface. Prevent free water from appearing on the surface during, or subsequent to, compaction operations.
- B. All portions of each layer shall be compacted to a density not less than 100 percent of the maximum density.
- C. After compaction, the top surface of the subbase course shall not extend more than 1/4 inch above nor more than 1/4 inch below the specified grade at any location.

3.4 TRAFFIC ON SUBBASE

- A. The movement of highway traffic over the final surface of the subbase may be permitted at locations designated by, and under such restrictions as ordered by the Engineer, provided such movements take

place prior to the final finishing of this course to the specified tolerance. The movement of construction equipment on this course may be permitted, at locations designated by and under such restrictions, as ordered by the Engineer. At locations where permission is granted for such movement, the temporary surface of the course, upon which the construction traffic is running, shall be placed and maintained at least 2 inches above the final surface of the course. Just prior to paving and after all construction traffic, not required for the removal, has ceased, the 2 inch protective layer shall be removed, and the exposed surface of the course prepared and compacted to the specified tolerance.

- B. Should the subbase become mixed with the subgrade or any other material, through any cause whatsoever, the Contractor shall, at his expense, remove such mixture and replace it with the appropriate subbase material.

3.5 FIELD QUALITY CONTROL

- A. Notify the Engineer at least one (1) working day in advance of all phases of filling and backfilling operations.
- B. Compaction testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with Section "Quality Requirements."
- C. Compaction tests shall be provided for every 250 cubic yards of fill for each lift.
- D. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contractor's expense.
- E. Acceptance Criteria: The sole criterion for acceptability of in-place subbase shall be in situ dry density. Minimum dry density for all subbase shall be 100 percent of the maximum dry density. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

END OF SECTION

SECTION 321613.16 – CAST-IN-PLACE CONCRETE CURBING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the installation of concrete curbing as shown on the Drawings, or as specified herein.
- B. The materials and methods specified herein are directly intended for placement of “new” concrete curbing. Where existing curbing is removed and replaced during construction, modifications to these specifications to match existing conditions shall be made as directed by the Engineer.

1.2 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. The latest edition of the following standards, as referenced herein, shall be applicable.
 - a. NYSDOT – Highway Division Standard Specifications for Highways and Bridges
 - b. American Society of Testing and Materials (ASTM).
 - c. American Concrete Institute. (ACI).
- B. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of materials with the specifications, if at any time during the Work, materials appear unsuitable in the opinion of the Engineer.

1.3 SUBMITTALS

- A. Concrete:
 - 1. The Contractor shall furnish the name and location of the concrete supplier.
 - 2. Submit the design mix for each class of concrete prior to use in the Work.
- B. Product Data:
 - 1. Submit manufacturer’s catalog cuts, specifications, and installation instructions.
- C. Test Results:
 - 1. The testing laboratory shall submit written reports of all tests, investigations, and recommendations to the Contractor and Engineer.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Concrete:
 - 1. All cast-in-place concrete shall be ready mixed concrete meeting the following criteria:
 - a. 28 day compressive strength-4000 psi
 - b. Air entrainment-4% to 8%
 - c. Slump-2" to 4". For machined formed curb 1 ½" maximum.
 - 2. Concrete shall be proportioned using methods 1 or 2 as outlined in ACI-301.
 - 3. The approved mix design shall be used throughout this project unless changes are ordered or approved by the Engineer.

- B. Premoulded Expansion Joint Filler:
 - 1. Concrete curbing shall be provided with a 1/2" premoulded expansion joint filler conforming to ASTM D 1751.
 - 2. The premoulded expansion joint filler shall be "pre-cut" to match the concrete curbing cross-sectioned dimensions as detailed on the Drawings.
- C. Curing Materials:
 - 1. Impervious Sheeting: ASTM C171.
 - 2. Liquid Membrane Curing Compound: ASTM C309, compound shall be free of paraffin or petroleum.
 - 3. "Kure-N-Seal 0800" by Sonneborn, "Cure & Seal" by Symons, or equal.
- D. Sealants:
 - 1. Joint Sealers: ASTM D 1850.
- E. Forms:
 - 1. Curb forms shall be of wood or steel, straight, and of sufficient strength to resist springing during depositing and consolidating the concrete. The outside forms shall have a height equal to the full depth of the curb. The inside form of curb shall have batter as indicated and shall be securely fastened to and supported by the outside form.
 - 2. Straight forms of wood shall be surfaced plank, 2-inch nominal thickness, straight and free from warp, twist, loose knots, splits, or other defects. Wood forms shall have a nominal length of 10 feet, with a minimum of three stakes per form, at maximum spacing of 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Radius bends may be formed with 3/4-inch boards, laminated to the required thickness.
 - 3. Steel forms shall be channel-formed sections with a flat top surface and with welded braces at each end and at not less than two intermediate points. Form ends shall be interlocked and self-aligning. Forms shall include flexible forms for radius forming, corner forms, form spreaders, and fillers. Forms shall have a nominal length of 10 feet, with minimum of two welded stake pockets per form. Stake pins shall be solid steel rods with chamfered heads and pointed tips, designed for use with steel forms.
 - 4. Rigid forms shall be provided for curb returns, except that benders of thin plank forms may be used for curb or curb returns with a radius of 10 feet or more, where grade changes occur in the return, or where the central angle is such that a rigid form with a central angle of 90 degrees cannot be used. Back forms for curb returns may be made of 1-1/2 inch benders, for the full height of the curb, cleated together.
 - 5. Machine formed curb: Straight and radius curbing may be placed with self propelling machine approved by the engineer. Approval of machine shall depend on job requirements and performance.

PART 3 – EXECUTION

3.1 INSPECTION

- A. The Contractor shall notify the Engineer 24 hours before placing concrete in order to give the Engineer an opportunity to inspect the formwork and related items prior to placement of the concrete.
- B. Delivery tickets shall show the amount of cement, brand, and amount of all admixtures, in addition to information required by ASTM C94, Section 14. Water added on the job shall be approved and the amount noted on the delivery ticket and initialed by the Contractor.

3.2 SUBBASE PREPARATION

- A. Concrete curbing shall be constructed on a compacted granular subbase as shown on the Drawings.
- B. The subbase shall be maintained in a smooth, compacted condition in conformity with the required section and established grade, until the concrete is placed.
- C. The subbase shall be in a moist condition when concrete is placed.
- D. The subbase shall be prepared and protected so as to produce a subbase free from frost when the concrete is deposited.

3.3 FORMWORK

- A. Earth cuts may not be used as forms for vertical surfaces.
- B. All forms shall be built mortar tight and of materials sufficient in strength to hold concrete without bulging between supports. Forms shall be maintained to eliminate the formation of joints due to shrinkage of the forms. Concrete, mis-shapen by bulges or deformations caused by inadequate forms, shall be removed or corrected as ordered by the Engineer. All replacements or corrections shall be made at the Contractor's expense.
- C. All surfaces of wooden forms that will be in contact with exposed concrete shall be thoroughly treated with an approved lacquer in the procedure recommended by the manufacturer. Forms so treated shall be protected from being damaged or dirtied prior to placing of the concrete.
- D. Metal forms shall be treated with an approved form lacquer or may be treated with an approved form oil. The metal used for forms shall be of sufficient thickness to remain true to shape. All bolt and rivet heads shall be designed to hold the forms rigidly together and to allow removal, without injury to the concrete. Metal forms which do not have smooth surfaces, correct alignment and clean surfaces shall not be used.
- E. The forms on the front of the curb shall be removed not less than 2 hours nor more than 6 hours after the concrete has been placed. Forms back of curb shall remain in place until the face and top of the curb have been finished as specified for concrete finishing.

3.4 CONCRETE PLACEMENT AND FINISHING

- A. Preparation:
 - 1. Set approved forms true to line and grade. Cast curb in 40 foot long sections. If curbs abut existing pavement, locate construction joints opposite existing pavement joints as directed.
 - 2. Provide cut to size joint filler between 40 foot sections and where curb abuts existing concrete paving and fixed structures or appurtenances. Protect the top edge of the joint filler during concrete placement with a temporary cap and remove after concrete has been placed.
 - 3. Expansion joints shall be constructed at right angles to the line of the curb.
 - 4. For slipform curbing, perform a "dry run" of the intended day's placement using engineer approved equipment or a "mock up" of matching dimensions. Movement of equipment shall have the ability to be followed by a string or survey equipment to indicate correct offset for placement. Remove all obstructions encountered along path and repair any questionable subbase as determined by engineer.

B. Concrete Placement:

1. Concrete shall be placed in layers not to exceed 6 inches. For slipform concrete refer to maximum placement depth as recommended by machine manufacturer,
2. Concrete shall be thoroughly consolidated by tamping and spading or with approved mechanical vibrators, eliminating all air pockets, stone pockets and honeycombing.
3. Place concrete in accordance with ACI 301 unless otherwise specified herein.
4. Cold Weather Concreting: Comply with ACI 306 for placement at temperatures of, or expected to be, below 40°F.
5. Hot Weather Concreting: Comply with ACI 305 for placement at temperatures of, or expected to be, above 90°F.
6. For slipform concrete, any curb placed outside the tolerance of 1/2 in. of the established line or 1/4 in. outside of the established grade shall be removed and replaced by the contractor.
7. When machine forming, the Contractor may provide additional width of curb without any other change in shape or dimension, if provided by the Contractor at no additional cost to the owner. If the Contract Documents or the Engineer require no curb be placed across the driveway entrances, the Contractor may continue placing curb across driveway entrances but the curb placed across driveway entrances, excluding transitions, must be cut out and the concrete legally disposed in a manner approved by the Engineer.

C. Concrete Finishing:

1. The top of the curb shall be rounded with an edging tool to a radius of 1/2-inch and the surfaces shall be floated and finished with a smooth wood float until true to grade and section and uniform in texture. Floated surfaces shall then be brushed with a fine-hair brush with longitudinal strokes.
2. Visible surfaces and edges of finished curb shall be free of blemishes and form and tool marks, and shall be uniform in color, shape, and appearance.
3. No plastering shall be permitted.
4. Curbing forms shall be left in place at least twenty-four (24) hours, or until the concrete has sufficiently set so that, in the opinion of the Engineer, the forms can be removed without injury to the curbing.

D. Machine Formed Curbs:

1. For Machine formed curb, uniformly feed concrete to the machine so the concrete maintains the shape of the section, without slumping after extrusion. Avoid stopping machine during placement. If stopping is necessary, immediately cease tamping and vibrating operations. Voids or honeycomb on the surface of the finished curb will not be allowed. Immediately after extrusion, perform any additional surface finishing required.

3.5 CURING

A. Impervious Sheeting Method:

1. The entire exposed surface shall be wetted with a fine spray of water and then covered with impervious sheeting material. Sheets shall be laid directly on the concrete surface with the light-colored side up and overlapped 12 inches when a continuous sheet is not used.
2. The curing medium shall not be less than 18 inches wider than the concrete surface to be cured, and shall be securely weighted down by heavy wood planks, or by placing a bank of moist earth along edges and laps in the sheets.
3. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged during curing. The curing medium shall remain on the concrete surface to be cured for not less than 7 days.

- or -

B. Membrane Curing Method:

1. The entire exposed surface shall be covered with a membrane forming curing compound.
2. Curing compound shall be applied in two (2) coats by hand operated pressure sprayers at a coverage of approximately 200 square feet per gallon for both coats, unless otherwise approved by the Engineer based upon manufacturer's data.
3. The second coat shall be applied in a direction approximately at right angles to the direction of application of the first coat. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel and shall be free from pinholes or other imperfections. Apply an additional coat to all surfaces showing discontinuity, pinholes or other defects.
4. Concrete surfaces that are subjected to heavy rainfall within 3 hours after curing compound has been applied shall be resprayed by the above method and at the above coverage at no additional cost to the Owner.
5. Expansion-joint openings shall be sealed at the top by inserting moistened paper or fiber rope or covering with strips of waterproof paper prior to application of the curing compound, in a manner to prevent the curing compound entering the joint.
6. Concrete surfaces to which membrane-curing compounds have been applied shall be adequately protected for 7 days from pedestrian and vehicular traffic and from any other action that might disrupt the continuity of the membrane. Any area covered with curing compound and damaged by subsequent construction operations within the 7-day curing period shall be resprayed as specified above at no additional expense to the Owner.

3.6 SEALING JOINTS

- A. The approximately horizontal sections of expansion joints shall be sealed with joint sealer. The joint opening shall be thoroughly cleaned before the sealing material is placed. Sealing shall be done so that the material will not be spilled on exposed surfaces of the concrete.
- B. Concrete at the joint shall be surface dry and atmospheric and concrete temperatures shall be above 50°F at the time of application of joint-sealing materials. Excess material on exposed surfaces of the concrete shall be removed immediately and exposed concrete surfaces cleaned.
- C. For Machine Formed Curbs
 1. Crack Control Joints. Crack control joints shall be formed or saw cut to a width of 1/8 inch minimum, ¼ inch maximum and a depth of 1 ½ inch. The cut or formed joints shall extend slightly below the surface of the adjacent pavement and shall be spaced at 1/8 inch intervals. When the curb is constructed next to concrete pavement, the curb shall line up with the pavement joints in additional joints shall be provided in the curb which line up with the pavement joints. The saw cut or formed joints shall be left unfilled.
 2. Expansion Joints. Expansion joints shall be 1 1/16 inches wide and contain Premoulded Resilient Joint Filler. The filler shall be cut to conform to the cross section of the curb and curb & gutter. The expansion joints shall be located at all immovable objects (bridge structures, etc.), adjacent to expansion joints in the pavement, where shown in the contract documents, or directed by the Engineer. Expansion joints shall not be required at regular intervals unless otherwise shown in the contract documents.

3.7 BACKFILLING AND RESTORATION

- A. After curing, debris shall be removed, and the area adjoining the concrete shall be backfilled, graded, and compacted to conform to the surrounding area in accordance with lines and grades indicated.

- B. All lawns, pavements, driveways, shrubs, or other improvements affected by curbing placement shall be restored to their original condition.

3.8 PROTECTION

- A. The Contractor shall protect the curbing and keep it in alignment and “first class” condition until the completion of the Contract. Any curbing, which is damaged prior to final acceptance of the Work, shall be removed and replaced at the Contractor’s expense.

END OF SECTION

SECTION 321813 – SYNTHETIC TURF PLAYING FIELD SYSTEM

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Provide all labor, equipment, and materials, and do work necessary to construct a synthetic turf field, as indicated on the Drawings and as specified. Work shall include but shall not be limited to:
 - 1. Synthetic surface including all inlays, logos and/or painted lines/markings and related finish work.
 - 2. Installation of perimeter anchor systems, and subsurface drainage system including stone base, panel drains, and geotextile separation fabric.

1.2 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirement shall govern.
 - 1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. T 89 - Determining the Liquid Limit of Soils
 - b. T 90 - Determining the Plastic Limit and Plasticity Index of Soils
 - 2. Occupational Safety and Health Administration (OSHA)
 - 3. Department of Transportation Standard Specifications
 - 4. American Society for Testing and Materials (ASTM):
 - a. D 395 - Rubber Property – Compression Test
 - b. D 418 - Pile Yarn Floor Covering Construction
 - c. D 2256 - Breaking Load (Strength) and Elongation of Yarn by the Single-Strand Method
 - d. D 3776 - Mass Per Unit Area (Weight) of Woven Fabric
 - e. D 3786 - Hydraulic Bursting Strength of Knitted Goods and Non-Woven Fabrics: Diaphragm Bursting Strength Tester Method
 - f. D 4491 - Water Permeability of Geotextiles by Permittivity
 - g. D 4533 - Trapezoid Tearing Strength of Geotextiles
 - h. D 4632 - Breaking Load and Elongation of Geotextiles (Grab Method)
 - i. D 4833 - Index Puncture Resistance of Geotextiles, Geo-membranes, & Related Products
 - j. F 355 - Shock Absorbing Properties of Playing Surface Systems and Materials
 - k. F 405 - Corrugated Polyethylene (PE) Tubing and Fittings
 - l. F 449 - Subsurface Installation for Agricultural Drainage or Water Table Control
 - m. F 667 - 8, 10, 12 and 15-inch Corrugated Polyethylene Tubing and Fittings
 - 5. Current National Collegiate Athletic Association (NCAA) rules for baseball.

1.3 DEFINITIONS

- A. Subgrade: The undisturbed earth or the compacted soil layer immediately below proposed drainage fill or playing field materials.
- B. Stone Base & Topping Stone: As required by section “Athletic Field Subsurface Drainage System” and in conformance with manufacturers requirements.

1.4 SUBMITTALS

- A. Manufacturer's Product Data: Submit manufacturer's specifications and installation instructions for all products in the playing field system, including certifications and other data as may be required to show compliance with the Contract Documents. Included but not limited to the following: drainage pipe material, panel drains, geotextile fabric, and perimeter turf anchoring system.
- B. Material Certifications: Manufacturer's or vendor's certified analysis for rubber and sand infill amendments.
- C. Material samples. Submit three samples each of the following:
 - 1. Geotextile fabric approximately 7"x11"
 - 2. Panel drain product approximately 6 inches in length, full width
 - 3. Gravel Materials – See Section 1.8, "Quality Control".
- D. Synthetic Turf Material Samples and Test Reports:
 - 1. Synthetic Turf – Three samples, approximately 7" x 11"
 - 2. SBR Rubber/Sand Mix with proper ratio or Rubber - three samples, approximately 8-ounces each
 - 3. Submit to Owner for approval - quality assurance information as delineated in paragraphs 1.5 Quality Assurance below
 - 4. Certified list of successful existing installations, including Owner representative and telephone number, attesting compliance with quality assurance information
 - 5. Certified copies of independent (third-party) laboratory reports on ASTM tests as follows:
 - a. Pile Height, Face Weight & Total Fabric Weight - ASTM D418
 - b. Primary & Secondary Backing Weights – ASTM D418
 - c. Tuft Bind – ASTM D1335
 - d. Grab Tear Strength – ASTM D1682
 - e. Dynamic Cushion Test (G-max) - ASTM F-355, Procedure A (system)
 - 6. Seam – Sewn or glued per manufacturers' recommendation
 - a. 24 inches in length
 - 7. Color: Submit sample of line markings for approval by Owner.
- E. Supplier List: Submit list of procured and contracted suppliers of all materials required for the Playing Field System.
- F. Shop Drawings:
 - 1. Sample Warranty
 - 2. Seam layout of the field
 - 3. Striping plan: Submit one for each field
 - 4. Layout for Owner designated sports, showing any field lines, markings, boundaries and logos.
 - 5. Construction detail sketches, especially those that may deviate from the plans and specifications. Include but not limited to the following: perimeter turf anchor details, details at irrigation valves, valve boxes, other inserts or fixed features, etc.
- G. Manufacturer's Review: submit written statement, signed by Contractor and synthetic field surfacing installer stating that the Drawings and Specifications have been reviewed by qualified representatives of the materials manufacturer, and that they are in agreement that the materials and system to be used for synthetic field surfacing are proper and adequate for the applications shown.

- H. Statement of Supervision: Upon completion of the Work, Contractor to submit a written statement signed by the synthetic turf manufacturer stating that the field supervision by the manufacturer's representative was sufficient to ensure proper application of the complete system and materials, that the Work was installed in accordance with the Contract Documents, and that the installation is acceptable to the manufacturer.

1.5 QUALITY ASSURANCE

- A. The sports field contractor shall have a Certified Field Builder (CFB) through the American Sports Builders Association (ASBA) on staff and shall have previously installed at least five (5) baseball/softball specific artificial turf infill fields in the last (3) years.
 - 1. The sports field contractor is responsible for the subgrade fine grading, installation of fabric, installation of field drainage system, installation of the perimeter nailing system, installation of field irrigation system and installation of the stone base.
- B. The synthetic field installation superintendent shall provide a list of ten (10) projects for which he/she was responsible.
- C. The Sports Field Contractor and the Synthetic Turf Manufacturer/Supplier must have been in business under the same ownership for at least three years and shall have been installing similar sports fields for that entire period.
- D. Provide test results from certified laboratory certifying capability of aggregate base course (stone base) to meet permeability and stability requirements before construction.
- E. Lay test strip and establish compaction and density rates for each course with nuclear gauge before beginning permanent work.
- F. The turf manufacturer/supplier shall submit a list of all completed products, using the specified turf system. The list shall include references for at least five of the projects.
- G. The synthetic field surfacing manufacturer shall provide evidence indicating that the specified materials have been successfully utilized on work of similar scope to that shown and specified for this Project.

1.6 QUALITY CONTROL

- A. Prior to construction: Submit samples of each of the following materials to establish Baseline specification and ratios for the remainder of the testing process.
 - 1. Gravel Drainage Material: Provide a one-gallon sample of each gravel drainage source and for each type of gravel material to be used for testing. This could include:
 - a. Gravel trench drainage material.
 - b. Base Stone.
 - c. Topping Stone.
- B. During Construction: Submit samples of each of the following during mass production of gravel materials for performance testing and prior to shipping. All costs associated with materials testing shall be paid for by the Contractor.
 - 1. Earthwork Material Qualification and Testing:
 - a. If found necessary, submit the following test data for each potential borrow source.
 - 1) Particle Size Analysis:
 - a) Method: AASHTO D422.

- b) Number of Tests: Three (3) per potential source.
 - c) Acceptance Criteria: Gradation within specified limits.
 - 2) Maximum Density Determination:
 - a) Method: Modified Proctor Test - ASTM D 1557.
 - b) Number of Tests: Three (3) per potential source.
 - b. Re-establish gradation and maximum density of fill material if source is changed during construction.
2. Earthwork/Compaction Testing:
- a. All compaction testing shall be performed by as required in Section “Trenching and Backfilling”.
 - b. Compaction testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with the following methods:
 - 1) In-place relative density:
 - a) Method: ASTM D-1556, Sand Cone Method.
 - b) ASTM D-2922, Nuclear Method.
 - 2) Number of Tests:
 - a) One (1) per 5,000 SF in each vertical lift.
 - c. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions.
 - d. Acceptance Criteria: The sole criterion for acceptability of in-place fill shall be in situ dry density. Minimum dry density for all fill or backfill shall be 95 percent of the maximum dry density as determined by the Modified Proctor Test (ASTM D-1557). If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal, replacement of the material and retesting.
3. Gravel Drainage/Stone Base/Topping Stone Material:
- a. A minimum of one-gallon sample for every 500 cubic yards of each material used shall be tested by the Playing Field Testing Agent for general compliance with the established Baseline specifications.
4. The Owner shall contract with, and pay for, an independent testing agent to certify and make recommendations regarding compaction, concrete, geotechnical and other items required by the Work. The Playing Field Contractor shall notify the Owner regarding timing, scheduling and use of these agents.
5. Playing Field Testing Agent:
- a. The Owner shall hire an independent Testing Agent to perform testing of the field system material components, as well as to certify the capability of the stone base course to meet permeability and stability requirements before construction. This Agent shall be A2LA accredited and insured.
 - b. Gravel Materials Test Reports: The Playing Field Testing Agent is to report/submit test results as they are known and simultaneously to the Playing Field Contractor, the Owner and its representatives.

1.7 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered and stored within the Contractor’s work limits or in an area approved by the Owner. Materials shall be inspected for damage immediately upon delivery.
- B. All material shall be stored in strict accordance with the manufacturer’s recommendations.
- C. Special care shall be exercised during delivery and storage to avoid damage to the products.

- D. Products that are damaged will be removed and replaced, unless the product can be repaired in an acceptable manner by the Contractor, at his expense.
- E. Packaged Materials:
 1. Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.
- F. Drainage Gravel and Stone Base:
 1. Deliver tested and approved lots in clean, washed and covered trucks to eliminate contamination during transportation. Place directly on playing field. Do not stockpile on site.

1.8 COMPLETION AND ACCEPTANCE

- A. General: Field completion shall be separated into 2 phases, “Preliminary Completion” and “Substantial Completion.”
- B. Preliminary Completion: Scheduled date for preliminary completion shall be at least 10 calendar days before Substantial Completion. Notify the Playing Field Designer/Engineer and Owner in writing, 3 days prior to scheduled date for observation for “Preliminary Completion.” To be considered “Preliminarily Complete” the following items shall be provided:
 1. Drainage system installed.
 2. Stone base in place, compacted and to grade.
 3. Synthetic turf installed inclusive of infill materials, field markings and logos.
 4. Goal post sleeves installed.
- C. Substantial Completion: After “Preliminary Completion” observation, the Playing Field Designer/Engineer and Owner shall prepare and submit to the Contractor, a punch list of items to be completed to achieve “Substantial Completion”. Contractor shall notify the Playing Field Designer/Engineer and Owner in writing, 5 days prior to a requested date for a site observation to meet “Substantial Completion.” To be considered “Substantially Complete” or “Playable” the following items shall be provided:
 1. All “Preliminary Completion” punch list items are complete.
 2. Submit five (5) copies of written operating and maintenance instructions. Provide format and contents as directed by the Engineer.
 3. Submit (5) copies of all certified surveys performed during construction for Quality Control.
 4. Instruct the Team or Owner’s personnel in the operation of the irrigation and other systems.
 5. Smooth, level playing surface level to grading tolerances.
 6. Written warranties/guarantees.
 7. Stockpiling or storage of required “attic stock” materials.
 8. Upon completion of the synthetic field surface, the contractor shall provide the owner with 2 hours of maintenance training that shall be recorded on a video tape and supplied to the Owner.

1.9 WARRANTY/GUARANTEE

- A. General: Warranties / Guarantees specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties/guarantees made by the Contractor under requirements of the Contract Documents.
- B. The following are inclusive of the term “Playing Field System” for provisions of the guarantee:
 1. Final grade tolerances to one-quarter inch in the length of 25' of finish grade in any direction.

2. Synthetic turf product as specified and represented by the Turf manufacturer/vendor.
 3. Working functions of the drainage system.
 4. All materials and products specified.
 5. Stone base shall be guaranteed to have a percolation rate greater than 6 inches per hour.
- C. **Installer Guarantee:** Provide in writing a “Full System Guarantee” agreement. The President(s) of the synthetic turf manufacturer (if different) shall sign this document and it shall include the following:
1. All work executed under this section will be free from defects of material and workmanship for a period of eight (8) years from date of Substantial Completion.
 2. Any defects will be remedied on written notice at no additional cost to the Owner.
 3. Guarantee shall include removal and replacement of materials (parts and labor) as required to repair synthetic field surfacing at no cost to the Owner.
 4. The 8-year warranty shall not be prorated and be provided by third party non-cancelable insurance policy.
 5. At no time in the life of the Guarantee shall the G-Max exceed 175 at any one point on the field.
- D. **Statement of Supervision:** Upon completion of the Work, Contractor to submit a written statement signed by the synthetic turf manufacturer stating that the field supervision by the manufacturer’s representative was sufficient to ensure proper application of the complete system and materials, that the Work was installed in accordance with the Contract Documents, and that the installation is acceptable to the manufacturer.
- E. **G-Max Testing:** The synthetic surface manufacturer shall retain a third-party certified testing laboratory and shall perform G-Max testing during the first year of the life of the Guarantee.
1. Testing shall be performed at within 10' of mid center, at the goal locations for soccer and lacrosse, and at 10 yards inside the corners of the overlaid rectangle fields. This results in a total of 9 tests. The testing shall be performed between 90 and 120 days after substantial completion. (These tests are paid for by the Contractor).
 2. Testing shall consist of shock attenuation per ASTM F-355 procedure A.
 - a. G-Max shall not change more than 5% (five percent) at any one location per year over the life of the Guarantee.
 - 1) In cases where the results of the above testing exceed the specified values, the condition shall be corrected by the synthetic surface manufacturer. The synthetic surface manufacturer shall provide adequate information to confirm that the mitigation measures were effective.
 - b. At no time in the life of the Guarantee shall the G-Max exceed 175 at any one point on the field.
 3. Future testing shall be performed by a certified independent lab and paid for by the Owner.

1.10 SPARE PARTS/ATTIC STOCK

- A. **Stockpile Materials:** Provide the following additional materials stored as directed by the Owner.

MATERIAL	QUANTITY
SBR Rubber Infill	2 tons
Batter's Box Removable Cutouts	1 full size removable velcro panels for each batter's box (game field and bullpens)
Pitcher's Mound Removable Cutouts	1 full size removable velcro panels for each pitcher's mound (game field and bullpens)

PART 2 – PRODUCTS

2.1 EARTHWORK MATERIALS

- A. Earthwork materials shall meet the requirements of Specification “Earthwork” and “Athletic Field Subsurface Drainage”.

2.2 PERIMETER TURF ANCHOR/NAILER

- A. The perimeter turf anchor/nailer shall be located at the field perimeter or turf edges and shall be as per drawings or approved equal.

2.3 SYNTHETIC INFILL TURF PRODUCT

A. Synthetic Turf Systems:

1. Baseball/Softball Turf Product:

- a. A blend of UV stable, polyethylene fibers.
- b. Minimum pile weight: 60 oz/sy
- c. Finish pile height outfield grass: 1.875” min., 2.000" max.
- d. Finish pile height infield grass: 1.875" min., 2.000" max
- e. Finish pile height mound, home plate, warning track, basepaths: 1.500" min., 1.750" max
- f. Permeability: 15” per hr. min.
- g. G-max at install: <165
- h. G-max over life of field: 175 max.
- i. Colors: Per owner request

2. Acceptable Synthetic Turf Baseball/Softball Systems:

a. Field Turf

- 1) "Double Play – Speed Fast Grass" (outfield and infield grass)
- 2) "Double Play – Speed Fast Clay" (base paths and warning track)
- 3) "Double Play - Vintage" (mound, home plate)

b. Shaw

- 1) "B1K - Tag Up" (outfield and infield grass)
- 2) "B1K - TruTrack" (warning track)
- 3) "B1K - Full Count" (mound)
- 4) "B1K - Six4Three" (base paths and home plate)

c. Astro Turf

- 1) “Rootzone Diamond Blend RBI" (outfield)
- 2) "Rootzone Diamond Blend RBI" (infield)
- 3) "Rootzone Diamond-i RBI" (warning track and base paths)
- 4) "Rootzone Diamond ERA" (mound, home plate)

- 3. All inlaid lines will be tufted in the factory to the extent practical. The use of field inlaid lines will be kept to a minimum.

B. Appearance/Feel:

- 1. The finished playing surface shall appear as mowed grass with no irregularities and shall afford excellent traction for conventional athletic shoes of all types.
- 2. The finished surface shall resist abrasion and cutting from normal use.

C. Infill Materials:

1. All products shall use SBR rubber and sand on the field surface.
2. Warning tracks shall use either an all sand infill or lava rock infill to create a different feel underfoot.
3. Rubber shall be dust toxics & metal free. Particle sizes shall be consistent in size and shape, between .25 and 3 mm.
4. Sand shall meet the following gradation:

SIEVE SIZE	% RETAINED
2 mm	0
.5 mm	20-30
.25 mm	40-50
.15 mm	30-40
.05 mm	5-10

5. Infill material shall be as recommended by the turf system MFR. The sand component shall be as recommended by the turf system MFR.
6. The exposed fiber height shall be 1/2" ± 1/4" after 40 hours of field use or 90 days after placement.

D. Glued Seams:

1. Adhesives for bonding tufted synthetic turf shall be as recommended by the synthetic turf manufacturer. Adhesives shall be one-part moisture cured polyurethane.

E. Sewn Seams:

1. Cord for sewing seam turf shall be as recommended by the synthetic turf manufacturer.

2.4 SYNTHETIC INFILL TURF MAINTENANCE EQUIPMENT

- A. Provide (one) turf sweeping unit and one groomer including all necessary tools and equipment to properly maintain the synthetic turf system including the alternate systems:
1. Supply a 6' wide field sweeper with magnet, which shall include a towing mechanism compatible with a field utility vehicle. The field sweeper shall be the LitterKat 760 sweeper, or equivalent.
 2. Supply one turf groomer. Turf groomer shall be 6' wide and be the Sportsturf Groomer 720-SDE by Greens Groom or the G7 Groomer by Go Groomer Go, or equal.

PART 3 – EXECUTION

3.1 EXAMINATION AND PROTECTION

- A. Verification of Conditions: Examine areas and conditions under which all work of this Section is being performed. Do not proceed with any work until unsatisfactory conditions have been corrected. Commencement of work implies acceptance of all areas and conditions.
- B. Protection of Work: Protect all on-going work, so as not to delay work due to weather or project related construction. This includes but is not limited to the use of tarps, geotextile, plywood and other protective measures.

- C. Protection of Persons and Property: Provide all necessary measures to protect workmen and passersby. Barricade open excavations occurring as part of the work, as required by municipal or other authorities having jurisdiction.
 - 1. Protect adjacent construction throughout the entire operation. Protect newly graded areas from destruction by weather or runoff. Protect structures, utilities, pavements, and other improvements from damage caused by settlement, lateral movement, undermining and washout.
- D. Unanticipated Conditions: Notify the Engineer immediately upon finding evidence of previous structures, filled materials that penetrate below designated excavation levels, or other conditions which are not shown or which cannot be reasonably assumed from existing surveys and geotechnical reports. Secure the Engineer's instruction before proceeding with further work in such areas.
- E. Installation of synthetic field surfacing shall be done only after excavation and construction work which might injure it has been completed. Damage caused during construction shall be repaired before acceptance.
- F. The Contractor shall coordinate the installation of the synthetic field surface and the surrounding surfaces for optimum interface at all edges.

3.2 EARTHWORK EXECUTION / SUBGRADE

- A. Preparation:
 - 1. Establish required lines, levels, contours and datum. Sports Field Contractor shall coordinate and ensure that the final grade of various materials such as the Stone Base, turf infill, etc., will result in the final field grades shown on the Contract Drawings when the complete system is installed.
 - 2. Maintain benchmarks and other elevation control points. Re-establish, if disturbed or destroyed, at no additional cost to the Owner.
 - 3. Establish location and extent of utilities before commencement of grading operations.
 - 4. Surface Water Control:
 - a. All earthwork operations shall be conducted in a manner to prevent surface water from infiltrating into the subgrade and base. Drainage is to be maintained in all parts of the site to drain surface water without ponding at all times. The Contractor, at his own expense, shall undercut soils saturated by ponding and backfill per this Section at the direction of the Engineer.
- B. Grading:
 - 1. The finished grade lines are shown on the contract drawings. Upon completion of this work, all debris shall be cleaned out and removed from the premises.
 - 2. Grade Verification: Upon completion of the field subgrade and topping stone, the Contractor shall provide drawings, completed by a licensed surveyor, sharing the elevations at each of the phases. Elevations shall be taken on a 25' grid across the entire field area.
 - 3. All cutting, filling, backfilling and grading necessary shall be done to bring the area to the following grade or subgrade levels:
 - a. The final elevation of the subgrade shall be within one-half inch on a 25-foot by 25-foot grid of the finished grades indicated on the Contract Drawings. Laser controlled or indicated equipment shall be used for this part of the work.
 - b. Subgrade shall mirror the final finish elevation of the field surface in regard to slope except where noted on the drawings.

- c. The final elevation of the topping stone shall be within one-quarter inch on a 25-foot by 25-foot grid of the finished grades indicated on the Contract Drawings. Laser controlled or indicated equipment shall be used for this part of the work.
 - d. All surfaces shall be graded to drain to drainage structures with no ponding. Grading tolerances given above do not relieve the Contractor from this requirement.
4. Sufficient grading must be done during the progress of the work so that the entire site shall be well drained and free from water pockets.

3.3 TURF PERIMETER NAILER/ANCHOR

- A. Install approved anchoring system at entire perimeter/edges of turf installation.
- B. Install anchoring/nailing “collar” around other in place or installed items (quick coupler boxes, power/communication boxes, etc.), as appropriate to installation sequencing.

3.4 INSTALLATION OF STONE BASE/TOPPING STONE

- A. Install tested and approved material at a uniform depth as indicated on drawings.
- B. Placement of the stone base shall proceed from a stable area next to the geotextile fabric and systematically worked outward onto the field area.
 - 1. The cover material shall be pushed forward and not dumped onto the liner.
 - 2. Laser operated equipment shall be utilized.
 - 3. All equipment used in spreading or traveling on the cover layer shall exert low ground pressures and shall be approved by the manufacturer and Engineer.
 - 4. During placement and spreading:
 - a. A minimum depth of 6 inches of granular material shall be maintained at all times between the fabric and wheels of trucks or spreading equipment.
 - b. Dozer blades, etc. shall not make direct contact with the fabric. If tears occur in the fabric during the spreading operation, the granular material shall be cleared from the fabric and the damaged area repaired as previously described.
 - c. All equipment traveling on the cover layer shall avoid making sharp turns, quick stops or quick starts.
 - d. Care shall be taken to not disturb, displace or damage the geotextile fabric or the drainage system.
- C. Placement of the Topping Stone: This stone layer shall be placed over the stone base at an approximate depth of one-half inch to produce a level/smooth surface prior to the placement of the synthetic turf.
- D. Finish grade for topping stone shall be verified using laser operated survey instrument with a tolerance of +/- one-quarter inch over 25 feet in any direction.
 - 1. A survey of the finished spot grades is to be developed by a State licensed surveyor over the entire surface in a 25-foot grid. The survey shall be certified (signed) and submitted to the Owner and its representatives for approval prior to installing the synthetic turf.

3.5 INSTALLATION OF SYNTHETIC TURF

- A. Synthetic turf shall be installed by crews employed by the Synthetic Turf manufacturer, in strict accordance with manufacturer’s recommendations and instructions including but not limited to, fabric, adhesives, seaming and abutting or attaching to adjacent materials.

- B. Field markings and lining of synthetic field surfacing shall be laid out as shown on the drawings and as approved by the Owner with Contractor submitted drawings.
- C. Turf panel seams shall be sewn with high strength thread using a double loop stitch or glued with an adhesive as recommended by the synthetic turf manufacturer and installed per manufacturer's instructions. All seams shall be flat, tight and permanent with no separation or fraying.
- D. All inlaid lines shall be backed using seaming tape with a width of 12 inches.
- E. Anchor turf edges at perimeter as shown on drawings and as recommended per synthetic turf manufacturer.
- F. At the end of each day, remove all scraps and other debris created by the synthetic turf installation from the playing field area.
- G. Infill materials shall be applied at a uniform depth and at an ultimate finish grade tolerance of $\frac{1}{4}$ inch at any point over the entire playing field area. Fill to a depth so that minimum of $\frac{1}{2}$ inch to a maximum of $\frac{3}{4}$ inch of fiber is visible.
- H. Fiber shall not be buried or trapped below infill material when complete.
- I. Anchor turf edges at field curb and at field perimeter as shown on drawings.
- J. The finish turf surface shall have a permeability test performed on 5 locations on the field.
- K. The permeability test shall utilize a dual ring infiltrometer in accordance with ASTM test method. All test results must be greater than 6 inches per hour.

3.6 FIELD MARKINGS

- A. The field lines shall be tufted or inlaid per Owner designated sports. The final field markings shall meet the NCAA standards as shown on the striping plan drawings.

3.7 CLEAN UP

- A. Remove all surplus excavated material not required for filling and backfilling, trash, and debris and dispose of it properly off of the Owner's property at Contractor's expense.

END OF SECTION

SECTION 321814 – SYNTHETIC TURF SUBSURFACE DRAINAGE SYSTEM

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Contractor shall provide all labor, equipment, and materials, and do work necessary to construct the base for a synthetic turf field, as indicated on the Drawings and as specified. Work shall include but shall not be limited to:
1. Earthwork Requirements
 - a. Excavation, trenching, grading, backfilling, compaction to achieve subgrade.
 - b. Laser grading.
 - c. Disposal of spoil materials.
 - d. Acceptance of mass subgrade by Playing Field Contractor (If Different).
 - 1) Mass excavation performed in other contract.
 - 2) Playing Field Contractor to review final submittals regarding mass excavation from General Contractor.
 - e. Playing Field Contractor to perform finish subgrade per this contract.
 - f. Grade elevation verification of finish subgrade.
 2. Drainage System Requirements
 - a. Filter fabric.
 - b. Gravel drainage trench fill material.
 - c. Panel drain pipe, collector pipe and fittings.
 - d. Stone base.
 - e. Clean outs and inline structures.
 - f. Grade elevation certification of finished stone base installation.

1.2 REFERENCES

- A. Comply with applicable requirements of the following standards. Should the standards conflict with other specified requirements, the most restrictive requirement shall govern.
1. American Association of State Highway and Transportation Officials (AASHTO).
 - a. T 89 - Determining the Liquid Limit of Soils.
 - b. T 90 - Determining the Plastic Limit and Plasticity Index of Soils.
 2. American Society for Testing and materials (ASTM):
 - a. D 3776 - Mass Per Unit Area (Weight) of Woven Fabric.
 - b. D 3786 - Hydraulic Bursting Strength of Knitted Goods and Non-Woven Fabrics: Diaphragm Bursting Strength Tester Method.
 - c. D 4491 - Water Permeability of Geotextiles by Permittivity.
 - d. D 4533 - Trapezoid Tearing Strength of Geotextiles.
 - e. D 4632 - Breaking Load and Elongation of Geotextiles (Grab Method).
 - f. D 4833 - Index Puncture Resistance of Geotextiles, Geomembranes, & Related Products.
 - g. F 405 - Corrugated Polyethylene (PE) Tubing and Fittings.
 - h. F 449 - Subsurface Installation for Agricultural Drainage or Water Table Control.
 - i. F 667 - 8, 10, 12 and 15-inch Corrugated Polyethylene Tubing and Fittings.
 3. Occupational Safety and Health Administration (OSHA).

1.3 DEFINITIONS

- A. Excavation: Removal of material encountered to subgrade elevations indicated and subsequent disposal or placement of materials removed.
- B. Unauthorized Excavation: Inadvertent or purposely removing materials beyond indicated subgrade elevations or dimensions without specific direction of the Engineer. Unauthorized excavation, as well as remedial work resulting from unauthorized excavation directed by Engineer shall be at Contractor's expense.
 - 1. Unauthorized excavation, including disposition of additional excavated materials and other work resulting from slides, cave-ins or remedial work shall be at Contractor's expense.
- C. Additional Excavation: When excavation has reached required subgrade elevations, the Engineer will be notified and will make an observation of conditions. If Engineer determines that bearing materials at required subgrade elevations are unsuitable, excavation shall be continued until suitable bearing materials are encountered and excavated material shall be replaced as directed by the Engineer.
 - 1. Removal of unsuitable material and its replacement as directed will be paid on basis of the Unit Price for Replacement of Unsuitable Soils provided by Contractor in its bid.
- D. Subgrade: The undisturbed earth or the compacted soil layer immediately below proposed playing field drainage or soil materials. This work is being performed by the Contractor.
- E. Finish subgrade: Final elevations and grading modifications to be performed in this Contract on the subgrade elevations. Playing field system to be installed above finish subgrade. This work is being performed by the Contractor.
- F. Gravel Drainage material: Stone material that may be used in drainage trenches surrounding perforated drainage piping. When used below and with the stone base, this material should bridge with the stone base as described herein.
- G. Base Stone: Approved stone material with the sizing and performance characteristics described herein. This stone material is installed immediately on top of the finished subgrade surface. Material could also be used in the drainage trenches if approved by the Engineer or Testing Agent.
- H. Topping Stone: Approved stone material with the sizing and performance characteristics described herein. This stone material is installed immediately on top of the base stone to create a smooth surface for the placement of the synthetic turf as well as to aid in achieving finish grade tolerances of the playing field subsurface.
- I. Stone Base: Final stone profile including both the base stone and topping stone.

1.4 SUBMITTALS

- A. Manufacturer's Product Data: Submit manufacturer's specifications and installation instructions for all products in the playing field system, including certifications and other data as may be required to show compliance with the Contract Documents.
- B. Material samples. Submit three samples each of the following:
 - 1. Geotextile fabric approximately 7"x11".
 - 2. Panel drain product approximately 6 inches in length, full width.

3. Aggregate Drainage Material: Provide a one-gallon sample of each gravel drainage source and for each type of gravel material to be used for testing. This could include:
 - a. Base Stone.
 - b. Topping Stone.
 - c. Gravel Trench Stone.
 - d. See Section 1.6, "Quality Control".

- C. Supplier List: Submit list of procured and contracted suppliers of all materials required for this part of the Work.

- D. Schedule: Work schedule for all work described in this specification section. This schedule shall be regularly updated and submitted as progress continues throughout ultimate completion.

- E. Shop Drawings:
 1. Sample Warranty.
 2. Construction detail sketches, especially those that may deviate from the plans and specifications.

- F. Playing Field Contractor Reference List:
 1. Up to date contact information.
 2. Responsibility/scope of work for project.
 3. Similar projects – full fields.

- G. Playing Field Contractor Job Superintendent Resume:
 1. Similar projects and references if different that Contractor reference list.

- H. Subcontractor List: Submit list of key subcontractors for the project. Briefly describe the role of each as well as their experience with similar types of facilities such as being constructed in these Documents. This list should include but is not limited to:
 1. Playing Field Base Installer / Contractor.

- I. Manufacturer's Review: submit written statement, signed by Contractor and synthetic field surfacing installer stating that the Drawings and Specifications have been reviewed by qualified representatives of the materials manufacturer, and that they are in agreement that the materials and system to be used for synthetic field surfacing are proper and adequate for the applications shown.

- J. Site Acceptance Statements:
 1. Prior to beginning Work on subgrade of playing field area: Submit a written statement signed by the General Contractor noting that the site has been reviewed and that documents showing compaction and certified elevations/planarity (if by others) have been reviewed. Note all discrepancies, conflicts or other issues. If none are found this should be noted in the statement. Upon acceptance, Work shall begin with the assurance that all work shall be warranted for the period as specified in these Documents.

- K. Grade Verification: A certified survey by a State licensed surveyor shall be made of the in-place condition at the finish subgrade and finish stone base for conformance to specified elevations. Each survey shall be submitted to the Owner for acceptance prior to installation of next layer.

1.5 QUALITY ASSURANCE

- A. All piping and appurtenances shall be new, clean and in accordance with material specifications, unless specifically noted on the plans.

- B. Size and classification shall be shown on the plans or as specified herein.
- C. The contractor who performs this work shall have installed five similar installations in the last three years. Submit complete list of projects, including project description, date of completion, and contact information. Comparable projects shall minimally include but not be exclusive to the following:
 - 1. Laser grading (not GPS) experience for gravel and finished surface meeting the requirements for finish grade required in this Contract.
 - 2. Installation of stone base and finished surface.
 - 3. Full field installations.
 - 4. Experience with testing protocols for stone base.
- D. Grade Certifications: A certified survey by a State Licensed land surveyor shall be made at the top of the Finish Subgrade and at the top of the installed topping stone base to verify conformance to specified final elevations. GPS survey laser equipment shall not be used for any finish elevation determination. Equipment mounted laser and hub or similar are required for playing field grading operations.

1.6 QUALITY CONTROL

- A. Pre-bid: Materials Inspection and Testing:
 - 1. Bidders are encouraged to:
 - a. Pre-test gravel drainage materials with an independent Testing Agent prior to submitting a bid. This does not guarantee that the materials or source will be approved for construction.
 - b. Pre-qualify any material deviating from that specified.
 - c. All costs associated with pre-bid testing shall be borne by the bidder.
- B. After Bid Award and Prior to construction: Submit samples of each of the following materials to establish Baseline specification and ratios for the remainder of the testing process.
 - 1. Gravel Drainage Material: Provide a one-gallon sample of each gravel drainage source and for each type of gravel material to be used for testing. This could include:
 - a. Gravel trench drainage material.
 - b. Base Stone.
- C. Topping Stone during Construction: Submit samples of each of the following during mass production of gravel materials for performance testing and prior to shipping.
 - 1. Gravel Drainage / Stone / Topping Stone Material:
 - a. A minimum of one-gallon sample for every 500 cubic yards of each material used shall be tested by the Testing Agent for general compliance with the established Baseline specifications.
- D. Testing Agent:
 - 1. Playing Field Testing Agent:
 - a. The Testing Agent shall perform testing of the field system material components, including but not limited to stone base, topping stone and gravel trench materials, as well as to certify the capability of the stone base course to meet permeability and stability requirements before construction.
 - b. The Contractor shall hire a testing agent to certify and make recommendations regarding playing field materials. Playing Field Contractor shall notify the Owner regarding timing, scheduling and use of these agents.
 - c. Agent shall be independent, A2LA accredited and insured.

- d. Potential Agents for Owner Consideration
 - 1) Sports Labs USA, Jeff Gentile, (603)-715-5453.
 - 2) Turf Diagnostic and Design, Sam Ferro, (913) 723-3700.
 - 3) The Pennsylvania State University, Andrew McNitt, (814) 364-2792.
 - e. The Testing Agent is to report/submit test results as they are known and simultaneously to the Playing Field Contractor, the Owner and its representatives.
- E. The Engineer shall recommend for owner approval or rejection based on results of the tests and recommendation of the Testing Agent.

1.7 PRODUCT DELIVERY

- A. Take all required measures to ensure that all piping and related appurtenances are protected from damage.
- B. Special care shall be exercised during delivery and storage to avoid damage to the products.
- C. All materials shall be delivered and stored within the Contractor's work limits or in an area approved by the Owner.
- D. All materials shall be stored in strict accordance with the manufacturer's recommendations.
- E. Products that are damaged will be removed and replaced, unless the product can be repaired in an acceptable manner by the Contractor, at his expense.
- F. Packaged Materials:
 - 1. Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site. Store out of low lying or drainage areas.
- G. Drainage Gravel and Stone Base:
 - 1. Deliver tested and approved lots in clean, washed and covered trucks to eliminate contamination during transportation. Place directly on playing field. Do not stockpile on site.

1.8 WARRANTY / GUARANTEE

- A. General: Warranties / Guarantees specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties/guarantees made by the Contractor under requirements of the Contract Documents.
- B. The following are inclusive of the term "Playing Field System" for provisions of the guarantee:
 - 1. Working functions of the drainage system.
 - 2. All materials and products specified.
 - 3. Drainage through the turf, infill and stone base shall be guaranteed to have a percolation rate of 6 inches per hour.
- C. Playing Field Subsurface and Drainage System Installer Guarantee: The President/Principal of this System installer shall prepare and sign this document and it shall include the following:
 - 1. Guarantee shall include removal and replacement of materials (parts and labor) not performing to the standards described to repair field at no cost to the Owner.

- D. Contractor shall not be held liable for incidental or consequential damages.
- E. The Warranty does not cover any defect, failure, damage caused by or connected with abuse, neglect, deliberate acts, acts of God, casualty or loads exceeding the Contractor's recommendations.

PART 2 – PRODUCTS

2.1 SPORTS FIELD SUBDRAINAGE SYSTEM

A. Underdrain Collector Pipe and Fittings:

1. General

- a. All specific pipes are noted on the Contract Drawings.
- b. Review drawings for locations of perforated and non-perforated piping.
- c. Solid wall pipe shall be high-density polyethylene pipe (HDPE) and shall conform to the requirements of AASHTO M252 Type S for 4 to 10 inch diameters and AASHTO M294 or ASTM F2306 Type S for 12 to 60 inch diameters.
- d. Perforated pipe shall be double wall high-density polyethylene pipe (HDPE) and shall conform to the requirements of AASHTO M252 Type SP for 4 inch to 10 inch diameters and AASHTO M294, Type SP or ASTM F2306 for 12 inch to 60 inch diameters.
- e. HDPE Perforated pipe shall have Class 2 slotted perforations in accordance with AASHTO M252 and M294.
- f. Virgin material for pipe and fitting production shall be high-density polyethylene conforming to the minimum requirements of cell classification 424420C for 4-inch to 10-inch diameters, and 435400C for 12-inch to 60-inch diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 5%.
- g. Provide drainage pipe complete with bends, reducers, adapters, couplings, collars, and joint materials.
- h. Solid wall pipe joints and fittings shall meet the watertight joint performance requirements of AASHTO M252, AASHTO M294, or ASTM F2306. 4-inch through 60-inch shall be watertight according to the requirements of ASTM D3212. Gaskets shall be made of polyisoprene meeting the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly.
- i. Solid wall HDPE 12-inch through 60-inch diameters shall have a reinforced bell with a bell tolerance device. The bell tolerance device shall be installed by the manufacturer.
- j. Provided drainage pipe complete with all fittings such as bends, reducers, adapters, couplings, collars, and joint materials. Fittings and couplers for perforated HDPE pipe shall be split couplings or snap couplings manufactured by the same manufacturer as the corrugated HDPE.
- k. Manufacturer's certification according to AASHTO M252 and M294 shall be submitted to the Owner prior to installation of the pipe.

2. Products:

- a. Advanced Drainage Systems (ADS).
 - 1) www.ads-pipe.com
- b. Hancor, Inc.
 - 1) www.hancor.com
- c. Approved Equal.

- B. Underdrain Panel Drains and Fittings:
 - 1. General:
 - a. Corrugated panel drain shall conform to the requirements for Class B Geocomposite as defined in ASTM D7001-06. This geocomposite product shall be composed of a flat pipe design consisting of a full circumference polyethylene core.
 - b. All materials and fittings shall conform to ASTM D7001-06.
 - c. The corrugated panel drain shall have a nominal thickness of 1-inch and a nominal width of 12-inch.
 - d. The core shall have a minimum compressive strength of 7,500 psf.
 - e. Geotextile wrap shall not be used on panel drain.
 - f. Provided panel drain complete with all fittings such as bends, reducers, adapters, couplings, collars, and joint materials. All fittings shall be supplied by the same manufacturer as the panel drain.
 - 2. Products:
 - a. "Varicor Technologies, Inc." - Multi Flow
 - 1) Multi-Flow.com
 - b. Hancor, Inc.
 - 1) www.hancor.com
- C. Collector Pipe Inline Drainage Structures / clean outs and sized as per drawings:
 - 1. General:
 - a. Inline structures only are to be used. Risers with fittings are not allowed.
 - 2. Products:
 - a. Cleanouts:
 - 1) Nyloplast Drain Basin
 - 2) Nyloplast Inline Drain
 - b. Grate:
 - 1) Solid, Ductile Iron - H20 Solid
 - 3. Open Grate - H10 Pedestrian Suppliers:
 - a. Nyloplast-ADS:
 - 1) www.ads-pipe.com/us
 - b. National Diversified Sales:
 - 1) www.ndspro.com
 - c. Approved equal.

2.2 GEOTEXTILE FABRIC

- A. General:
 - 1. Provide on playing field subgrade and playing field drainage trenches.
 - 2. The geotextile shall be a nonwoven sheet of plastic yarn as defined by ASTM D123 and conform to the criteria presented in the following table. These requirements shall be based on the Minimum Average Roll Value (MARV) which is defined as the value that can be expected, with 95% confidence, to be the minimum test average obtained on a roll sampled and tested in accordance with ASTM D4759.

3. Geotextile shall meet the requirements of AASHTO M288 except as modified herein.

Geotextile Class 1			
Physical Property	ASTM Procedure	Minimum Acceptance Criteria	
		English	Metric
Grab Tensile Strength	D 4632	200 lbs	890 N
Grab Elongation at Break	D 4632	50%	50%
CBR Puncture Strength	D 6241	500 lbs	2224 N
Mullen Burst Strength	D 3786	260 psi	1790 Kpa
Trapezoidal Tear	D 4533	80 lbs	355 N
Apparent Size Opening (AOS)	D 4751	70-100 US Std Sieve	150 – 212 um

4. Product:
- a. Mirafi 180 N:
 - 1) www.mirafi.com
 - b. Propex Geotex 801:
 - 1) www.geotextile.com
 - c. Approved equal.

2.3 PERIMETER NAILER / ANCHOR

- A. ACQ pressure treated lumber:
 - 1. Conform to AWWA treatment standards for ground contact applications.
 - 2. Size per drawings.
- B. Anchor attachment:
 - 1. Tapcon 3/16" x 2-3/4" Hex.
 - 2. Approved equal.

2.4 STONE BASE AND TOPPING STONE

- A. The stone base shall conform to the turf vendor's standard specifications subject to the Owner's approval and meet the following gradation for AASHTO #57 Stone:

Sieve Size	% Passing
1-1/2" (37.5mm)	100
1" (25.4mm)	95-100
1/2" (12.7mm)	25-80
1/4"	0-10
No. 8 (2.36mm)	0-5

- B. The topping stone must conform to the turf vendor's standard specs, is subject to the Owner's approval, and meets the following gradation for No. 89 Stone:

Sieve Size	% Passing
1/2"	100
3/8"	90-100

Sieve Size	% Passing
No. 4	20-55
No. 8	0-15
No. 16	0-10
No. 50	0-5

- C. All stone shall be angular. Rounded or river stone is not acceptable.
- D. In no instance shall multiple quarry sources be used within a single playing field area.
- E. Drainage Characteristics:
 - 1. Permeability for the topping stone shall be greater than 20"/hr.
- F. Top dressing Stone is allowed for use to level the finished surface of the base stone. Total allowable finish depth to be in the range of 1/2 to 3/4 inch.
- G. The gravel should meet one or both of the following stability requirements:
 - 1. Sulfate Soundness (C-88)
 - a. Not to exceed 12% loss.
 - 2. LA Abrasion (ASTM C131)
 - a. Not to exceed 40.
- H. Alternate Gravel Backfill for Drainage Collector trenches only: Clean crushed stone or washed gravel. Gravel shall meet one or both of the above stability requirements using the stated test methods.
 - 1. Size criteria:
 - a. 95% Passing a 1 inch sieve.
 - b. No more than 10% passing a #10 mesh (2.0 mm) sieve.
 - c. No more than 5% passing a #18 mesh (1.0 mm) sieve.
 - 2. Installed below the stone base material.
 - 3. Must bridge with the stone base material.

PART 3 – EXECUTION

3.1 EXAMINATION AND PROTECTION

- A. Verification of Conditions: Examine areas and conditions under which all work of this Section is being performed. Commencement of work implies acceptance of all areas and conditions. Correct any and all conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until satisfactory conditions have been corrected.
- B. Protection of Work this Contract: Protect all on-going work, so as not to delay work due to weather or project related construction. This includes but is not limited to the use of tarps, geotextile, plywood, and other protective measures.
- C. Protection of Persons and Property: Provide all necessary measures to protect workmen and passersby. Barricade open excavations occurring as part of the work, as required by municipal or other authorities having jurisdiction.
 - 1. Protect adjacent construction throughout the entire operation. Protect newly graded areas from destruction by weather or runoff. Protect structures, utilities, pavements, and other

improvements from damage caused by settlement, lateral movement, undermining and washout.

- D. Unanticipated Conditions: Notify the Owner immediately upon finding evidence of previous structures, filled materials that penetrate below designated excavation levels, or other conditions which are not shown or which cannot be reasonably assumed from existing surveys and geotechnical reports. Secure the Owner's instruction before proceeding with further work in such areas.
- E. Installation of synthetic field surfacing shall be done only after excavation and construction work which might injure it has been completed. Damage caused during construction shall be repaired before acceptance.
- F. The Contractor shall coordinate the installation of the synthetic field surface and the surrounding surfaces for optimum interface at all edges.

3.2 PLAYING FIELD FINISH SUBGRADE

- A. Layout and Control:
 - 1. Refer to Section Earth Moving for subgrade work.
 - 2. Refer to drawings for playing field limits and layout.
- B. Excavation or Fill to achieve subgrade / finish subgrade if found necessary:
 - 1. Refer to Section Earth Moving for additional Earthwork requirements
- C. Playing Field Finish Subgrade:
 - 1. General:
 - a. After verification and approval of the subgrade, the Playing Field Contractor shall then proceed with the fine grading of the subgrade. All fine grade cutting, filling, and backfilling necessary to be performed on the subgrade to bring the playing field areas finish subgrade to the required tolerances.
 - b. Finish subgrade shall mirror the final finish elevation of the field surface in regard to slope except where noted on the drawings.
 - c. Compaction for the finish subgrade shall meet 90% Standard Proctor.
 - d. Proof-rolling of the finish subgrade is required.
 - e. Sufficient grading must be done during the progress of the work so that the entire playing field area shall be well drained and free from water pockets.
 - 2. Playing Field Finish Subgrade Tolerance Requirements: The final elevation of the finish subgrade shall be plus or minus one half inch at any point on the field and on a 25 foot by 25 foot grid grade.
 - 3. Playing Field Finish Subgrade Elevation Certification: A certified survey by a State licensed land surveyor shall be performed at 25-foot grid centers to verify required grade and elevation tolerances of the finish subgrade. The digital survey document shall indicate spot elevations and tenth of foot contours and shall be submitted to the Engineer for review and approval prior to moving to next part of work.

3.3 TURF PERIMETER NAILER/ANCHOR

- A. Install approved anchoring system at entire perimeter/edges of turf installation.
 - 1. Fasten anchoring system to concrete curb or channel drain with concrete screws.
 - a. Attach at all ends of the nailer boards.
 - b. Anchors to be spaced 24" o.c. max.

- B. Install anchoring/nailing “collar” around other in place or installed items (drain basins, cleanouts, sports equipment anchors, quick coupler boxes, etc.), as appropriate to installation sequencing.

3.4 DRAINAGE SYSTEM INSTALLATION

A. Collector Pipe Trenching:

1. Only perform trenching, drainage pipe installation and backfilling operations that can be completed in one day. Exposed trenches that collapse due to rain or other occurrences shall be widened and filled as specified or refilled with subgrade materials, compacted, and retrenched.
2. Contractor to connect playing field drainage system to site storm drainage, as indicated in the Drawings.
3. Excavate trenches for all piping to a uniform depth and width, sufficiently wide enough to provide ample working room.
 - a. Minimum width of trench to be twice the pipe diameter.
 - b. Abnormal conditions such as large cobbles or unstable conditions that may cause trench to lose integrity shall be reported to the Owner immediately.
4. Excavate trenches and conduit to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil.
Contractor to remove or manipulate spoils from trenching excavation so that integrity of finished grade requirements is maintained prior to placing filter fabric.

B. Installation of Geotextile Filter Fabric:

1. Install filter fabric onto full extent of field, bottom and sides of trenches for collector and panel drain piping.
2. Extend fabric a minimum of 12 inches past each side of top of trench on top of the subgrade.
3. The fabric shall be placed as smooth and wrinkle-free as possible.
4. All laps shall be at least thirty-six inches in width without tension, stress, folds, or creases.
5. At time of installation, fabric will be rejected if it has defects, ribs, holes, flaws, deterioration, or damage incurred during manufacture, transportation, handling, or storage. Damaged materials shall be removed and replaced at no additional cost to the Owner.
6. Install fabric to coordinate with trenching operation and other parts of the Work.
7. Sandbags or other devices may be used as required to hold the fabric in position during installation. Materials, equipment or other items shall not be dragged across the fabric or be allowed to slide down slopes on the fabric.
8. Fabric shall be covered as soon as possible after placement to minimize exposure to sunlight and to other types of contamination such as surface run-off.
 - a. Fabric shall not be exposed for more than 10 days.
 - b. Fabric which becomes overly contaminated shall be removed and replaced with new fabric.
9. Contractor to temporarily fold fabric over at the tops of the trenches during construction to eliminate migration of soil materials into the gravel trench. Just prior to installation of dynamic stone base, this fold shall be undone and fabric shall be laid over the finished subgrade. Should contamination of the gravel trench occur, Contractor shall remove contaminated material and replace with clean approved materials at no cost to the Owner.

C. Installation of Collector piping:

1. Lay perforated pipe directly on drainage stone layer at trench bottom in accordance with pipe manufacturer’s recommendations.
2. Provide collars and couplings as required for installation of these lines as well as for connections to drainage structures and trench drains.

3. Install collector as indicated on drawings so that it connects to site structures or extends to limits indicated.
 - a. Protect any exposed ends of pipe until connected to detention or storm sewer system by playing field Contractor or others.
 4. Pipe laying work shall commence at the main collector line and shall proceed from low point of system to high point.
 - a. Pipe shall be laid true to line and grade in such a manner as to assure a close concentric joint with the adjoining pipe.
 - b. Protect any exposed ends of the pipe until final connections are made.
 - c. After pipe installation has been observed by the Owner, drainage material shall be placed around and over the pipe.
 5. Install inline structures, drain inlets, catch basins per manufacturer's instructions.
 6. After pipe installation has been observed by the Playing Field Designer/Owner, approved drainage material shall be placed around and over the pipe to the top of the trench.
 - a. If observation indicates poor alignment, debris, displaced pipe, infiltration or other defects, Contractor to take whatever steps are necessary to correct such defects prior to proceeding.
 7. Installation of drain lines from ground boxes:
 - a. Install drain lines from in ground boxes installed in the field area. Connect directly to field drainage system or minimally to the gravel perimeter trench.
 8. Collector pipe Clean Out: A nyloplast or equal structure is to be used for the cleanout. Cap shall be placed flush with finish subgrade as shown on the drawings.
- D. Drainage Fill:
1. Trenches:
 - a. Place approved drainage gravel fill material in the drainage trench in a single layer. Place material around drainage pipe until it is level with the surrounding subgrade. This shall be the base stone unless otherwise approved prior to installation.
 - b. Contractor to consider temporarily covering top of open gravel trench with the geotextile material overlapping the top of the trench to reduce contamination of the gravel material.
- E. Installation of Panel Drains:
1. Install panel drains per the manufacturer's written instruction.
 2. The panel drains are to be installed directly over the top of the geotextile fabric.
 3. Connect panel drains to collector/header piping using panel drain manufacturer provided fittings, per manufacturer instructions and as shown on drawings.
 4. Provide 48 hours' notice to the Owner to inspect the panel drains in place prior to covering.
- F. Clean Out/End Cap: Cap shall be recessed below the base stone and flush with finish subgrade elevation. Install bolt, washer and nut on cap for metal detection purposes.
- G. Testing Drain Lines: The Contractor shall ensure that lines are in proper alignment and free flowing prior to placing the drainage gravel fill material. The Playing Field Designer/Owner will observe portions of this process for general conformance of the specifications.

3.5 INSTALLATION OF STONE BASE / TOPPING STONE

- A. Install only tested and approved material at a uniform depth.

- B. Placement of the base stone shall proceed from a stable area next to the geotextile fabric and systematically worked outward onto the field area.
 - 1. The cover material shall be pushed forward and not dumped onto the liner.
 - 2. Laser operated equipment shall be utilized.
 - 3. All equipment used in spreading or traveling on the cover layer shall exert low ground pressures and shall be approved by the manufacturer and Engineer.
 - 4. During placement and spreading:
 - a. A minimum depth of 6 inches of granular material shall be maintained at all times between the fabric and wheels of trucks or spreading equipment.
 - b. Dozer blades, etc. shall not make direct contact with the fabric. If tears occur in the fabric during the spreading operation, the granular material shall be cleared from the fabric and the damaged area repaired as previously described.
 - c. All equipment traveling on the cover layer shall avoid making sharp turns, quick stops or quick starts.
 - d. Care shall be taken to not disturb, displace or damage the geotextile fabric or the drainage system.
 - e. Contractor shall install stone base layer in such a way as to reduce separation of the fines and larger particles in the stone blend.

- C. Placement of the Topping Stone: This stone layer shall be placed over the stone base at a finished depth as shown on the drawings to produce a level/smooth surface prior to the placement of the synthetic turf. Due to possible drifting of this finish stone material into the stone layer below, more material may be required than the finished depth to eventually achieve finished grade elevations at the top of the finish stone layer and shall be considered as part of the overall quantities necessary.
 - 1. Contractor shall install topping stone layer in such a way as to reduce separation of the fines and larger particles in the stone blend.

- D. Finish grade for Top Dressing Stone:
 - 1. Shall be verified using laser operated survey instrument with a tolerance of +/- one-quarter inch over 25 feet in any direction.

- E. Stone base elevation verification: A survey of the finished elevation for the stone base is to be developed by a State licensed surveyor over the entire surface in a 25 foot grid. The survey shall be certified (signed) and submitted to the Owner and its representatives for approval prior to installing the synthetic turf. The survey shall indicate spot elevations and tenth of foot contours.

- F. Perform 4 permeability tests, in 4 different locations per full-size field, using a dual ring infiltrometer on the finished topping stone prior to installing the finished surface.
 - 1. All test results must be greater than 20 inches per hour.

3.6 PROTECTION

- A. Protection of materials and work shall be the responsibility of the Contractor during installation and thru acceptance/substantial completion. All material damaged prior to acceptance shall be replaced at no cost to the Owner.

END OF SECTION

SECTION 321815 – ATHLETIC CHANNEL DRAIN SYSTEM

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes install a precast, interlocking polymer concrete trench drainage system as specified and as shown on the working drawings.
- B. System Description: Modular trench drain system precast from a corrosion resistant polymer including interlocking modular components for on-site installation.

1.2 QUALITY ASSURANCE

- A. Warranty:
 - 1. Channel drain system is included under the Project Warranty.

1.3 SUBMITTALS

- A. Contractor will submit shop drawings showing a plan of the total drainage system listing all parts being provided with exact center-line dimensions suitable for installation. Copies of the manufacturer's recommended method of installation, assembly, and anchorage shall be submitted for review.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Physical and Mechanical Characteristics of Polymer Concrete Channel Units:
 - 1. Top unit width - Approximately 6.1 inches.
 - 2. Internal width - Approximately 4.0 inches.
 - 3. Unit depth - Approximately 9.8 inches.
 - 4. Compressive strength of specified polymer concrete - 14,000 psi min.
 - 5. Flexural strength of specified polymer concrete - 3,000 psi min.
 - 6. Water absorption rate - not to exceed 0.1%.
- B. Channel Profile shall include positive interlocking tongue and groove connections which can be sealed to provide watertight connections. Each precast polymer channel shall be an approximately 1 meter unit and be available in curved and straight sections.
- C. Catch Basins shall be precast polymer concrete, 39.37" in length and include a plastic grating.
- D. Channel Drainage System:
 - 1. ACO Sport – System 4020 neutral channel or equal.
- E. Grates:
 - 1. Grates are to be high density Polyethylene.

2. Grate locking devices are to be galvanized steel.
 - a. Turf to track and turf to curb applications: ACO Sport Model No. 494 Grate combined drain and anchoring system grate, by ACO Sport or equal.

PART 3 – EXECUTION

3.1 SITE PREPARATION

- A. Excavate the area for channel placement wide enough to accommodate the channel size with a minimum of six inch concrete encasement. Channels require a minimum of six inches concrete support, and top of channel must be evenly aligned to the surface of the surrounding surface on both sides, as well as underneath the channel.

3.2 INSTALLATION

- A. Install precast channel drain in accordance with the details on the plans and the manufacturer's instructions.
- B. Channel sections are installed from the outlet ends of the system, working from the catch basins. Insert channels from above to allow ends to interlock. Channel sections shall be placed on brick, rebar basket, channel chair, low slump concrete grout slurry, or suspended to obtain correct finished elevation. Cutting will be made, if required, by masonry or concrete saw. Cover top of channel with tape, plastic, or plywood strips to protect the channel surface from concrete during pouring.
- C. Finishing and Cleanup:
 1. Following final set of concrete, remove protection covering top of channels.
 2. Install drain system in strict accordance with manufacturer's recommendations and shop drawings.

END OF SECTION

SECTION 323113 – CHAIN LINK FENCE AND GATES

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The Contractor shall provide all labor, materials, equipment, and services necessary for, and incidental to, the installation of chain link fence and gates, as shown on the Drawings and as specified herein.
- B. All chain link fence shall have a thermally-bonded and fused polymer color coating.
- C. All gates and gate hardware shall be powder coated.
- D. Chain Link Fence Slats

1.2 QUALITY ASSURANCE

- A. Comply with standards of the Chain Link Fence Manufacturer's Institute.
- B. Provide steel fence and related gates as a complete system produced by a single manufacturer, including necessary erection accessories, fittings, and fastenings.
- C. Comply with ASTM A53 for requirements of Schedule 40 piping.
- D. Comply with ASTM F668 Specification for Polymer Coated Chain Link Fence Fabric.
- E. Comply with ASTM F1043 Specification for Strength and Protective Coatings of Metal Industrial Fence Framework.
- F. Height of fence shall be measured from the top of concrete footing to the top of post.
- G. Manufacturer: Company shall be headquartered in the US having US manufacturing facility/facilities specializing in manufacturing chain link fence products with at least 5 years of experience.
- H. Fence contractor: Company with demonstrated successful experience installing similar projects and products in accordance with ASTM F567.
- I. Tolerances: Current published edition of ASTM specifications tolerances apply. ASTM specification tolerance supersede any conflicting tolerance.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
 - 1. Fence and gate posts, rails, and fittings
 - 2. Chain link fabric, reinforcements, and attachments.
 - 3. Gates and hardware.
- B. Shop Drawings: Show locations of fences, gates, posts, rails, tension wires, details of extended posts, extension arms, gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, gate elevations, sections

details of post anchorages, attachment, bracing, and other required installation and operational clearances.

- C. Samples for Verification: For each type of chain-link fence and gate indicated:
 1. Polymer coated steel wire (for fabric) in 6-inch (150-mm) lengths on shapes for posts, rails, wires, and gate framing.
 2. Two-stage powder coat finish, in 6-inch (150-mm) lengths on shapes for gate framing.
- D. Product Certificates: For each type of chain-link fence and gate, signed by product manufacturer:
 1. Strength test results for framing according to ASTM F1043.
 2. Material certifications, made in USA, Buy America Act or Buy America when required.
- E. Qualification Data: For installer.
- F. Field quality-control test reports.
- G. Maintenance Data: For the following to include in maintenance manuals:
 1. Polymer finishes.
 2. Powder coat finishes.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed chain-link fences and gates similar in material, design and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.5 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 – PRODUCTS

2.1 STEEL FRAME WORK

- A. Unless noted otherwise on the Drawings, minimum Nominal Framework Sizes shall be the following:

FENCE HEIGHT	LINE POSTS	END, CORNER & PULL POSTS	RAILS & BRACES	GATE FRAMES	*GATE POSTS	CONCRETE FOUNDATION DIA.		DEPTH
						Diameters	Corner/End	
						LINE POSTS	PULL & GATE POSTS	
3'	1-1/2"	2"	1-1/4"	1-1/2"	3"	12"	12"	4'
3'-6"	2"	3"	1-1/4"	1-1/2"	4"	12"	12"	4'
4'	2"	3"	1-1/4"	1-1/2"	4"	12"	12"	4'
4'-6"	2"	3"	1-1/4"	1-1/2"	4"	12"	12"	4'

FENCE HEIGHT	LINE POSTS	END, CORNER & PULL POSTS	RAILS & BRACES	GATE FRAMES	*GATE POSTS	CONCRETE FOUNDATION DIA.		DEPTH
						Diameters	Corner/End	
						LINE POSTS	PULL & GATE POSTS	
5'	2"	3"	1-1/4"	1-1/2"	4"	12"	12"	4'
6'	2"	3"	1-1/4"	1-1/2"	4"	12"	18"	4'
8'	2 1/2"	3"	1-1/4"	1-1/2"	4"	12"	18"	4'
10'	3"	4"	1-1/4"	1-1/2"	4"	12"	18"	4'
12'	3"	4"	1-1/4"	1-1/2"	4"	12"	18"	5'

SCHEDULE 40 S/L PIPE TABLE		
NOMINAL SIZE (IN.)	ACTUAL OUTSIDE DIAMETER (IN.)	WEIGHT *(LB/FT)
1	1.315	1.67
1-1/4	1.660	2.27
1-1/2	1.900	2.71
2	2.375	3.65
2-1/2	2.875	5.79
3	3.500	7.58
3-1/2	4.000	9.11

50,000 PSI HOT DIPPED GALVANIZED STEEL TUBING		
NOMINAL SIZE (IN.)	ACTUAL OUTSIDE DIAMETER (IN.)	WEIGHT *(LB/FT)
1	1.315	
1-1/4	1.660	1.83
1-1/2	1.900	2.28
2	2.375	3.12
2-1/2	2.875	4.64
3	3.500	5.71
3-1/2	4.000	6.56

- B. Pipe must comply with ASTM F1043 Group 1A or 1C.
- C. Round Steel Pipe and Rail: Round steel pipe and rail to be cold-rolled electric resistance welded pipe in accordance with ASTM 1043 materials group 1C, minimum steel yield strength 50,000 psi. Type B external coating, hot dip galvanized zinc 1.0 oz/ft² with a clear polymeric overcoat, Type D interior 90% by weight zinc-rich coating having a minimum thickness of 0.30 mils.
- D. Polymer Color Coated Pipe: Polymer coated pipe shall have a polyester or polyolefin coating fused and adhered to the exterior zinc coating of the galvanized pipe in accordance with ASTM F1043. The minimum thickness of the polymer coating shall be 3 mils.
 - 1. Color: Black. To match fabric per ASTM F934.
- E. Polymer Coated Color Fittings: In compliance with ASTM F626. Polymer coating minimum thickness to be 0.006 in. fused and adhered to the zinc coated fittings. Color to match fence system.

2.2 CHAIN LINK FABRIC

- A. General: Height indicated on Drawings. Provide fabric in one-piece heights for fence heights up to 10 feet measured between top and bottom of outer edge of selvage knuckle or twist. Comply with ASTM A392, CLFMI CLF 2445, and requirements indicated below:

1. Steel Chain Link Wire Fabric:
 - a. Polymer Coated Steel Fabric: ASTM F668, the wire gauge specified for polymer coated wire is that of the metallic coated steel core wire.
 - 1) Class 2b fused and adhered.
 - 2) Color: Black. In compliance with ASTM F934.
- B. Mesh Size:
 1. 2 inches.
- C. Selvages: Knuckled top and bottom.

2.3 SWING GATES

- A. Assemble gate frames with fully coped welds as shown on the Drawings or on Shop Drawings approved by the Engineer.
 1. All ferrous metal components shall be blast cleaned to and SSPC-6 commercial blast clean.
- B. Powder Coated Framework for Gates:
 1. Colored Powder Coated Framework:
 - a. Powder for coating shall be a polyester-based thermal setting resin.
 - b. Powder coat system shall meet or exceed the following test requirements:
 - 1) Direct Impact Resistance: ASTM D2794-93, up to 160 inches per pound.
 - 2) Flexibility: ASTM D522-93, Method B, equal to or less than a 1/4-inch mandrel.
 - 3) Pencil Hardness: ASTM D3363-93a, HB-2H.
 - 4) Crosshatch Adhesion: ASTM D3359-97, Method B, 5B.
 - 5) Salt Spray Resistance: ASTM B117 plus 1,000 hours.
 - 6) Humidity Resistance: ASTM D2247 plus 1,000 hours.
 - c. Moveable parts such as hinges, latches and drop rods may be field coated using a liquid polymer touch up.
 - d. Chain link fabric on gate same as finish same for fencing.
 - e. Color: To match that of the fencing system.

2.4 GATE HARDWARE

- A. Hinges: Non-lift-off type, offset to permit 180-degree swing, and of suitable size and weight to support gate. Provide 1-1/2 pair of hinges for each leaf over 6 feet high.
- B. Latch: Provide plunger bar type complete with flush plate set in concrete for all double gates and single gates over 10 feet. Padlock eye shall be an integral part of latch construction.
 1. Provide plunger bar complete with flush plate set in concrete on each gate leaf.
 2. Provide flush plate set in concrete for both the fully open position and full closed position
- C. Keeper for Vehicle Gates: Provide keeper which automatically engages the gate leaf and holds it in open position until manually released.

2.5 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Post Tops: Steel, wrought iron, or malleable iron.
- B. Stretcher Bars: One piece equal to full height of fabric, minimum cross-section 3/16 inch by 3/4 inch.

- C. Metal Bands (for stretcher bars): Steel, wrought iron, or malleable iron, to secure stretcher bars to end, corner, pull and gate posts.
- D. Wire Ties:
 - 1. For tying fabric to line posts, rails and braces: 9-gauge steel wire.
- E. Truss Rods: 3/8-inch diameter.
- F. Angle Beams, I Beams and Steel Shapes: ASTM A36.
- G. Bolts and Nuts: ASTM A307, Grade A.

2.6 CHAIN LINK FENCE PRIVACY SLATS

- A. Design: Rigid, flat tubular body with legs inside for extra support and durability. Flexible and resilient wing portions positioned on each side of the slat body. Serrations added to the wings for easier installation and locking power.
- B. Standard Height: 8' high for outfield fence only
- C. Slat Length: 2" shorter than the overall fence height
- D. Color: Black, to be confirmed with owner
- E. Privacy Factor: 90% approximately
- F. Materials: The winged slat product is extruded from High Density Polyethylene (HDPE), color pigments and ultra violet (UV) inhibitors, specifically designed to retard the harmful effects of the sun and lengthen the life of the product. Winged slats include Ethyl Vinyl Acetate (EVA), a softer plastic to keep the wings flexible and resilient.
- G. Durability: HDPE fence products are resistant to: severe weather conditions, salt water, sand, road dirt, most acids, alcohol, alkaline, ammonia, petroleum distillates and common environmental pollutants.
- H. Suppliers:
 - 1. Pexco PDS Winged Privacy Slats for Chain Link Fence by Hoover Fence Co.
 - 2. Approved equivalent

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work and other conditions affecting performance:
 - 1. Begin installation in general site areas or those not directly adjacent to the playing field only after final grading including topsoiling and paving is completed in that area or as otherwise permitted by Engineer.
 - 2. For installation directly adjacent to the playing field, coordinate footing installation timing with final installation of playing field materials so as not to contaminate, destroy or displace these playing field materials.

3. If unsatisfactory conditions are present, proceed with installation only after they have been corrected.

3.2 PREPARATION

- A. Coordinate fence and gate installation with completion of finished grading and installation of adjacent finish field materials.
- B. Stake locations of fence lines, gates and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, irrigation system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION

- A. Space posts equidistant in the fence line with a maximum of 10 feet on center or as shown on Drawings.
- B. Footings: Excavate holes as indicated for fence and gate posts. Excavate footings to depths and widths as noted in Specifications or on drawings. Install gravel drainage material in bottom of hole as shown on the drawings.
- C. Setting Posts and Footings at Concrete Areas: Set posts in center of hole. Embed post so that bottom of post is flush with the bottom of concrete footing and in gravel drainage layer. Fill hole with concrete. Plumb and align posts. Vibrate or tamp concrete for consolidation. Finish elevation on top of footing to be coordinated with construction of concrete adjacent to posts or as shown on drawings. Do not attach fabric to posts until concrete has cured a minimum of 7 days.
- D. Setting Posts and Footings at Warning Track Areas: Set posts in center of hole. Embed post so that bottom of post is flush with the bottom of concrete footing and in gravel drainage layer. Fill hole with concrete. Plumb and align posts. Vibrate or tamp concrete for consolidation. Finish elevation on top of footing to be set below finish grade. Do not attach fabric to posts until concrete has cured a minimum of 7 days.
- E. Setting Posts and Footings in Grass Areas: Set posts in center of hole. Embed post so that bottom of post is flush the bottom of concrete footing and in gravel drainage layer. Fill hole with concrete. Plumb and align posts. Vibrate or tamp concrete for consolidation. Finish concrete in a dome shape above ground to shed water. Do not attach fabric to posts until concrete has cured a minimum of 7 days.
- F. Locate corner posts at corners and at changes in direction. Use pull posts at all abrupt changes in grade and at intervals no greater than 500 feet. On runs over 500 feet, space pull posts evenly between corner or end posts. On long curves, space pull posts so that the strain of the fence will not bend the line posts.
- G. Install top rail continuously through post caps or extension arms, bending to radius for curved runs. Install expansion couplings as recommended by fencing manufacturers.
- H. Install intermediate rails in one piece between posts and flush with post on fabric side using special offset fittings where necessary.
- I. Diagonally brace corner posts, pull posts, and terminal posts to adjacent line posts with truss rods and turnbuckles.

- J. Attach fabric to playing field side of fence. Bottom of fabric to be set on finished grade of curb, track, or playing field except when indicated otherwise. Thread stretcher bars through fabric using one bar for each gate and end post and two for each corner and pull post. Pull fabric tight so that the maximum deflection of fabric is 2 inches when a 30-pound pull is exerted perpendicular to the center of a panel. Maintain tension by securing stretcher bars to posts with metal bands spaced 15 inches on center. Fasten fabric to steel framework with wire ties spaced 12 inches on center for line posts and 24 inches on center for rails and braces. Bend back wire ends to prevent injury. Tighten stretcher bar bands, wire ties, and other fasteners securely.
- K. Position bolts for securing metal bands and hardware so nuts are located opposite the fabric side of fence. Tighten nuts and score excess threads.
 - 1. Secure post tops, extension arms, and caps with one-way cadmium plated steel screws.
- L. Install gates plumb and level and adjust for full opening without interference. Install ground-set items in concrete for anchorage, as recommended by fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary. Attach fabric as for fencing. Install ground-set items in concrete as shown on the drawings.
- M. Touch Up: Small nicks or other blemishes shall be touched up with paint materials suitable for and matching the finish of the damaged material. Severely damaged fencing/gates deemed as unacceptable at the sole discretion of the Owner or its representatives shall be replaced at the contractor's expense.

END OF SECTION

SECTION 329113 – SOIL PREPARATION

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes provisions for the placement of topsoil in conformance with the lines, grades and thicknesses as shown on the Drawings and as herein specified.
- B. Minimum thickness is 6 inches, for all areas disturbed during construction and not receiving other surface treatment.
- C. The Contractor shall furnish all materials and perform all work in accordance with these specifications, drawings, and instructions provided by the Owner.

1.2 SUBMITTALS

- A. Samples: Furnish earth materials to the testing laboratory for analysis and report, as directed by the Engineer or as outlined in the specifications.
- B. Quality Control Submittals:
 - 1. Test Reports: The testing laboratory shall submit written reports of all tests, investigations, and recommendations to the Contractor and the Engineer. Indicate quantities of materials necessary to bring topsoil into compliance with textural/gradation requirements. Indicate quantity of lime and quantity and analysis of fertilizer.

1.3 REFERENCES

- A. Comply with the latest edition of the following standards:
 - 1. Applicable State DOT Standard Specifications.
 - 2. “Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO).”
 - 3. ASTM International (ASTM):
 - a. C33, Standard Specification for Concrete Aggregates.
 - b. C602, Standard Specification for Agricultural Liming Materials.
 - 4. U.S. Bureau of Reclamation (USBR):
 - a. 514.4.4, Reclamation Instructions, Series 510—Land Classification Techniques and Standards, Part 514—Laboratory Procedures, Chapter 4—Particle-Size Analyses.
 - b. 14.8.7, Reclamation Instructions, Series 510—Land Classification Techniques and Standards, Part 514—Laboratory Procedures, Chapter 8—Soil Chemical Tests.

1.4 QUALITY ASSURANCE

- A. Provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications.

1.5 PROJECT CONDITIONS

- A. Coordinate the placement of topsoil with the completion of all underground work including that of the other trades.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Topsoil: Natural, friable, fertile, fine loamy soil possessing the characteristics of representative topsoils in the vicinity which produces a heavy growth; free from subsoil, objectionable weeds, litter, sods, stiff clay, stones larger than 1 inch in diameter, stumps, roots, trash, toxic substances, or any other material which may be harmful to plant growth or hinder planting operations. Contractor is to verify amount stockpiled and supply any additional as needed:
1. Topsoil shall contain not less than 6% nor more than 20% organic matter as determined by the wet combustion method (chronic acid reduction); topsoil shall have a pH value of not less than 5.5 nor more than 7.0;
 2. Topsoil shall meet the following mechanical analysis:

SIZE OF SCREEN	% OF SOIL RETAINED	% OF SOIL PASSING
1"	0	100
1/4	3	97
No. 100	40-60	40-60

3. Imported topsoil in which more than 60% of the material passing a No. 100 sieve shall be rejected. All percentages are to be based on the dry weight of the samples.
4. Laboratory tests of the topsoil shall be performed by a certified testing laboratory, and shall perform tests for the following:
 - a. Sieve particle size analysis and gradient of mineral content
 - b. Chemical analysis of the following:
 - 1) pH and buffer pH.
 - 2) Percent of organic content.
 - 3) Nutrient levels of phosphorus, potassium magnesium, manganese, iron, zinc and calcium.
 - 4) Soluble salt.
 - 5) Cation exchange capacity (CEC).
 - c. Recommended fertilizer and rate of application for low and medium level nutrient soils.

2.2 MATERIAL ACCEPTANCE

- A. Topsoil may be acquired from approved sites that are designated on the Drawings. If no sites are designated, material proposed for use as topsoil must be stockpiled, sampled, and tested prior to use.
- B. Topsoil containing foreign material may be rejected on the basis of visual examination by the Engineer, prior to testing.
- C. Acceptance of topsoil shall be based upon test results. Tested topsoil must be approved in writing by the Engineer before any material is used.

2.3 SOIL AMENDMENT

- A. Textural Amendments: Amend as necessary to conform to required composition by incorporating sand, peat, manure, or sawdust
- B. Fertilizer: Shall be delivered to the site, mixed as specified, in the original unopened standard size bags showing weight, analysis and name of manufacturer. Store fertilizer in a weatherproof place and in such a manner that it shall be kept dry and its effectiveness shall not be impaired.

1. Percentages of nitrogen, phosphorus and potash shall be based on laboratory test recommendations. For the purpose of bidding, assume 10% nitrogen, 6% phosphorus and 4% potash by weight. At least 50% of the total nitrogen shall contain no less than 3% water-insoluble nitrogen. At least 60% of the nitrogen content shall be derived from super-phosphate containing not less than 18% phosphoric acid or bone meal containing 25% to 30% phosphoric acid and 2% to 3% nitrogen. Potash shall be derived from muriate of potash containing 55% to 60% potash.
 2. Grass or sodded areas shall have fertilizer applied according to soil text report or as specified on the drawings.
- C. Organic Matter: Leaf matter and yard waste composted sufficiently to break down all woody fibers, seeds, and leaf structures, and free of toxic and non-organic matter. Organic matter shall be commercially prepared compost. Coarse sand shall be clean, sharp, natural sands free of limestone, shale and slate particles, ASTM C33 fine aggregate with a Fines Modulus Index of 2.75 or greater.
- D. Lime: Shall be ground palletized, or pulverized lime manufactured to meet agricultural standards and contain a maximum of 60% oxide.

PART 3 – EXECUTION

3.1 STOCKPILING

- A. Stockpile topsoil from on-site sources or provide from off-site sources and stockpile, if on-site quantities are deficient.
- B. Stockpiles are to contain not less than 200 cubic yards or the minimum required for the project.
- C. Stockpiles are to have a maximum height of 10 feet and be trimmed to uniform surfaces and slopes.
- D. The sites of all stockpiles and adjacent areas, which have been disturbed are to be graded and put into an acceptable condition by seeding, as directed by the Engineer.

3.2 PREPARATION

- A. Preparation - Disk, drag, harrow or hand rake subgrade to a depth of 3 inches to provide bond for topsoil. Topsoil, which must be transported across finished walks, shall be delivered in such a manner that no damage will be done to the walks. The Contractor shall be responsible for the repair of such damage.
- B. Before placing topsoil, rake subsoil surface clear of stones larger than 1.5 inches, debris, and roots. Compact topsoil to form a layer with minimum depth of 4 inches in lawn areas and 12 inches in shrub beds. Topsoil shall be placed so that after final settlement there will be good drainage (and conforming to elevations shown on drawings). Contractor is to maintain surfaces and place any additional topsoil necessary to replace that which may have eroded before acceptance.
- C. Locations containing unsuitable subsoil shall be treated in one of the following manners:
 1. Where unsuitability within the construction site is deemed by the Owner to be due to excessive compaction caused by heavy equipment or by the presence of boards, mortar, concrete or other construction materials in subgrade, and where the natural subsoil is other than A.A.S.H.T.O. classification of A6 or 7, the Contractor shall loosen such areas with spikes, discs, or other means to loosen the soil to a condition acceptable by the Owner. The Contractor shall also remove all debris and objectionable material. Soil should be loosened to a minimal depth of

12 inches with additional loosening as required to obtain adequate drainage. Contractor may introduce peat moss, sand, or organic matter into the subsoil to obtain adequate drainage should he so desire. All such remedial measures shall be considered as incidental to the work and no extra payment shall be made for this part of the work; and

2. Where subgrade is deemed by the Owner to be unsuitable because the natural subsoil falls into an AASHTO classification of A6 or 7 and contains moisture in excess of 30%, then such a condition shall be rendered suitable by installation of a subdrainage system or by other means described elsewhere in these specifications. Where such conditions have not been known or revealed prior to planting time and where they have not been recognized in the preparation of drawings and specifications, then the Owner shall issue a change order to install the proper remedial measures, all of which shall be in addition to the contract sum.

3.3 TOPSOIL PLACEMENT

- A. Do not place topsoil when subsoil or topsoil is frozen, excessively wet, or otherwise detrimental to the Work.
- B. Mix soil amendments, lime, and fertilizer with topsoil before placement or spread on topsoil surface and mix thoroughly into entire depth of topsoil before planting or seeding. Delay mixing of fertilizer if planting or seeding will not occur within 3 days.
- C. Place 1/2 of total depth of topsoil and work into subgrade soil to create a transition layer. Place remainder of topsoil to depth after compacting to 75% where seeding and planting are scheduled.
- D. Uniformly distribute to within 1/2 inch of final grades. Fine grade topsoil eliminating rough or low areas and maintaining levels, profiles, and contours of subgrade to ensure positive drainage.
- E. Remove stones exceeding 1 inch, roots, sticks, debris, and foreign matter during and after topsoil placement.
- F. Remove surplus subsoil and topsoil from Site. Grade stockpile area as necessary and place in condition acceptable for planting or seeding.

3.4 CLEANING

- A. Remove all surplus subsoil and topsoil from project site.
- B. Leave the site in clean, satisfactory condition ready to receive subsequent operations.

END OF SECTION

SECTION 329200 – TURF AND GRASSES

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the preparation of ground surfaces, fertilization of applicable areas, seeding, mulching of applicable surface areas, and maintenance of turf areas until such time as project is accepted by Engineer. Applicable areas shall include those identified on the Contract Drawings.
- B. Seed shall be sown from April 1 to June 15, or from August 15 to October 15 of given calendar year, unless otherwise approved by Engineer.

1.2 SUBMITTALS

- A. Quality Control Submittals:
 - 1. Certification:
 - a. Submit manufacturer's or vendor's certified analysis for soil amendments and fertilizer materials.
 - b. Submit vendor's certified analysis for each grass seed mixture required, stating botanical and common name, percentages by weight, percentages by purity, germination, and weed seed.
 - B. Maintenance Instructions: Submit instructions recommending procedures to be implemented for maintenance of landscaped work for one (1) full year. Submit prior to expiration of Contractor's maintenance period.
 - C. Submit description of planned mulching techniques and corresponding manufacturer's installation recommendations for approval by Engineer.

1.3 QUALITY ASSURANCE

- A. All turf and grasses work shall be performed by one Contractor, with proven expertise in this type of construction.
- B. Package standard products with the manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
- C. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of materials with the specifications.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver packaged materials in containers, showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored on site.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Fertilizer:

1. Commercial fertilizer (5-10-5) inorganic, or organic, containing not less than five (5) percent nitrogen, ten (10) percent available phosphoric acid, and five (5) percent water soluble potash.
2. If, as an alternative, the Contractor wishes to substitute for commercial fertilizer 5-10-5, another commercial fertilizer with a 1-2-1 ratio, such as 10-20-10 or 6-12-6, they may do so with the approval of the Engineer and the rate of fertilizer to be used shall be whatever amount is required to furnish the same amount of nitrogen as would be supplied by the 5-10-5.

B. Seed:

1. Seed shall be fresh, clean, new-crop seed mixed in the proportions specified for species and variety, conforming to Federal and State Standards.
2. Use the following standard mixture blue seal classic, unless a special mixture is otherwise indicated or approved by the Engineer.

SPECIES	% BY WEIGHT	% BY PURITY	% BY GERMINATION
Tall Fescue	60	85	80
Kentucky Bluegrass	20	95	85
Perennial Rye	20	95	85

**Kentucky Bluegrass must consist of a minimum of two varieties.*

3. Weed seed content shall not exceed 0.25%.

C. Mulch:

1. Provide and install a mulch adequate to protect the seeding during its growing period. It shall be the responsibility of the Contractor to determine the appropriate mulching techniques for the particular site conditions and acquire approval of the same from the Engineer.
2. Clean straw for gentle slopes, consisting of stalks of oats, wheat, rye, or other approved crops which are free of noxious weed seeds. Weight shall be based on a fifteen (15) percent moisture content.
3. Mulching blanket for steep slopes and drainage swales: “Curlex Blanket” by American Excelsior, “Ero-Mat” by Contech Construction Products, Inc, or approved equal.
4. Bonded fiber matrix for mulching in areas where slopes are 1.5H:1V or greater, or cut or fill slopes 20 feet (6m) or more in height. Product shall be EcoAegis as manufactured by Canfor, or approved equal meeting U.S. DOT Standard Specification FP-96, Section 713.05(h)
 - a. Package Weight: 50 pound (18.6kg) bags.
 - b. Moisture Content: 12 +/- 3 percent by weight.
 - c. Minimum Water Holding Capacity: Approximately 10 times dry weight.
 - d. Composition:
 - 1) Refined Softwood Fiber: (90% by weight).
 - 2) Blended Hydrocolloid-based Binder: (9% by weight).
 - 3) Mineral Activator: (1% by weight).
 - e. Color: Natural – No Dye Products.

D. Water: Clean and potable.

2.2 ACCESSORIES

- A. Soil Amendments: Soil amendments are not to be made without review and authorization by the Engineer.
 - 1. Lime: Natural limestone containing not less than 85% of total carbonates, ground so that not less than 90% passes a 10-mesh sieve and not less than 50% passes a 100-mesh sieve.
 - 2. Aluminum Sulfate: Commercial grade.
 - 3. Peat Humus: FS Q-P-166 and with texture and pH range suitable for intended use.
 - 4. Bonemeal: Commercial, raw, finely ground; 4% nitrogen and 20% phosphoric acid.
 - 5. Superphosphate: Soluble mixture of treated minerals; 20% available phosphoric acid.
 - 6. Sand: Clean, washed sand, free of toxic materials.
 - 7. Perlite: Conforming to National Bureau of Standards PS 23.
 - 8. Vermiculite: Horticultural grade, free of toxic substances.
 - 9. Sawdust: Rotted sawdust, free of chips, stones, sticks, soil, or toxic substances and with 7.5 pounds (2.8 kg) nitrogen uniformly mixed into each cubic yard of sawdust.
 - 10. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25% by volume of straw, sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants.
 - 11. Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing available plant nutrients.
 - 12. Composted Organic Material: Shall have a minimum organic matter content of 60 percent, as determined by ASTM D-2974, and screened to ¾-inch (1.9 cm).

PART 3 – EXECUTION

3.1 PREPARATION OF TOPSOIL

- A. Clean topsoil of roots, plants, stones, clay lumps and other extraneous materials harmful or toxic to plant growth.
- B. Mix fertilizer into top 2 inches (5 cm) of topsoil at a rate of 10 pounds (3.7 kg) per 1,000 square feet. (92.9 m²)
- C. Mix approved soil amendments into top 2 inches (5cm) of topsoil at necessary rates.
- D. Water dry topsoil to depth of 4 inches (10cm) at least 48 hours prior to seeding to obtain a loose friable seed bed.

3.2 PREPARATION OF UNCHANGED GRADES

- A. Where lawns are to be planted in areas not altered or disturbed by excavating, grading, or stripping, prepare soil for seeding as follows:
 - 1. Till to a depth of not less than 6 inches (15cm).
 - 2. Apply soil amendments and initial fertilizers as specified.
 - 3. Remove high areas and fill in depressions.
 - 4. Till soil to a homogeneous mixture of fine texture, free of lumps, clods, stones, roots, and other extraneous matter.
 - a. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such materials off the site; do not turn over into soil being prepared for lawns.

- b. Apply specified commercial fertilizer at rates specified and thoroughly mixed into upper 2 inches (5 cm) of topsoil. Delay application of fertilizer, if lawn planting will not follow within one week.

3.3 SEEDING

- A. Apply seed only when wind velocities are less than five (5) miles per hour (9km/hr).
- B. Sow half the seed with mechanical seeder.
- C. Sow remaining half of the seed at right angles to the direction of the first seeding pattern, using the same method.
- D. Apply seed at the rate of 4 pounds (1.5 kg) per 1,000 square feet (92.9 sq. meters) of disturbed area.
- E. Cover seed to a depth of 1/8-inch (3mm) by raking, harrowing, or cultipacking.
- F. Roll seeded area with roller weighing no more than 150 pounds per foot of roller width.
- G. Water seeded areas to a depth of four (4) inches (10cm) as required during the maintenance period.

3.4 MULCHING

- A. Spread straw uniformly over seeded area with 75% ground coverage and at least 1-1/2 inches loose depth.
 - 1. If, in the opinion of the Engineer, wind will disrupt the mulching, apply asphalt emulsion at a rate of 10 gallons (37.81) per 1,000 square feet (92.9 m²).
- B. Place mulching blanket in accordance with submitted manufacturer's recommendations.
- C. Place bonded fiber matrix mulch material, EcoAegis, at a rate of 3,500 to 4,100 pounds per acre, based on manufacturer's recommendations.

3.5 HYDROSEEDING

- A. Mix specified seed, fertilizer, and pulverized mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
- B. Apply slurry uniformly to all areas to be seeded. Rate of application as required to obtain specified seed sowing rate.

3.6 PROTECTION

- A. Immediately after seeding, erect barricades and warning signs as required to protect newly planted areas from pedestrian and vehicular traffic. Maintain barricades throughout maintenance period until grass and/or turf is established.
- B. Repair or replace damaged landscape work as directed by Engineer.

3.7 MAINTENANCE

- A. Begin maintenance immediately after seed placement.

- B. Watering:
 - 1. Keep soil moist during seed germination period.
 - 2. Supplement rainfall to produce a total depth penetration of 2 inches per day after germination.
 - 3. Prevent erosion and displacement of seed.
- C. Mowing:
 - 1. When grass reaches 4 inches in height, mow to 2-½ inches in height.
 - 2. Maintain grass between 1-½ inches and 2-½ inches in height.
 - 3. Do not cut off more than 30% of grass leaf in a single mowing.
 - 4. Remove grass clippings.
- D. Reseed and mulch spots larger than 1 square foot not having uniform coverage.
- E. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading, and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.
- F. Maintain and protect all seeded areas until final acceptance of the Contract.

3.8 FINAL ACCEPTANCE

- A. Final acceptance of lawn areas will be granted when a uniform stand of acceptable grass is obtained, with a minimum of 95 percent coverage.
 - 1. Portions of the lawn areas may be accepted at various times at the discretion of the Engineer.
- B. Upon acceptance by the Engineer of a seeded area, the Owner will immediately assume responsibility for maintenance and protection of that portion of the Contract seeding.

END OF SECTION

SECTION 330513 – MANHOLES AND STRUCTURES

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Installation of manholes, catch basins, precast concrete structures, frames, grates, covers, steps, and piping connections as shown on the Drawings and as specified herein.
 - 2. Alteration of existing structures as shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE

- A. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:
 - 1. American Society of Testing and Materials (ASTM).
 - 2. American National Standards Institute (ANSI).
 - 3. Occupational Health and Safety Administration (OSHA).

1.3 SUBMITTALS

- A. Shop Drawings: Submit the following for approval:
 - 1. Design and construction details of all precast concrete units.
 - 2. Fabrication, assembly, and installation details for all castings and miscellaneous metal works.
 - 3. Precast concrete structure design calculations verifying the structures have been designed to withstand the burial, submergence and anticipated live and dead loads. Design calculations for uplift forces shall incorporate a minimum factor of safety of 1.15.
- B. Product Data:
 - 1. Manufacturer's catalog cuts, specifications, and installation instructions.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the site to prevent interruption of the Work.
- B. All materials shall be inspected by the Contractor upon delivery to the site. The Contractor shall notify the Engineer of any loss or damages. Replace loss or repair damage to new condition at the Contractor's expense.
- C. Store materials to allow easy access for inspection and identification.

PART 2 – PRODUCTS

2.1 DESIGN REQUIREMENTS

- A. Design: In accordance with ASTM C890 – Minimal Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
- B. Loading: AASHTO HS-20 with 30 percent impact and 130 pound/cubic foot equivalent soil pressure.

2.2 PRECAST CONCRETE DRAINAGE STRUCTURES

- A. Drainage manholes shall conform to subpart "Precast Concrete Manholes."
- B. Catch basins with greater than 6 feet sidewall depth shall conform to subpart "Precast Concrete Manholes."
- C. Catch basins with less than or equal 6 feet sidewall depth shall be 2-foot 6-inch by 2-foot 6-inch square I.D. precast concrete catch basin units as manufactured by Fort Miller Company, Inc., of Schuylerville, NY or equal.
- D. Precast catch basin units shall conform to the dimensions shown on the Drawings and as detailed in Shop Drawings approved by the Engineer.
- E. Unless otherwise specified precast concrete units shall conform to ASTM C478.
- F. A precast concrete slab, as necessary for proper frame and grate placement, shall be provided at the top of the catch basin unit. The slab shall be designed for an H-20.

2.3 PRECAST CONCRETE MANHOLES

- A. All precast concrete manhole units shall be as manufactured by Fort Miller Company, Inc., of Schuylerville, New York or approved equal.
- B. Precast manhole units shall conform to the dimensions shown on the Drawings and as detailed in Shop Drawings approved by the Engineer.
- C. Unless otherwise specified, manhole sections shall conform to ASTM C478.
- D. Precast structure bases shall be of the "base unit" type, with an integral base and barrel section. The barrels shall be constructed in increments of 1 foot to provide the indicated height with the fewest joints. Openings for pipe connections will not be permitted closer than 1 foot to the nearest joint. Mark the date of manufacture and name or trademark of manufacturer in the inside of each section.
- E. Manholes barrels, servicing pipes less than 27-inch diameter, shall be 48-inch diameter. Manholes barrels, servicing pipes 27-inch diameter and larger shall be 60-inch diameter. Larger diameter manholes barrels shall be provided as indicated on the Drawings or as specified herein.
- F. Joints shall be rubber and concrete using O-ring gaskets (ASTM C443) or butyl rubber gaskets (ASTM C443), or tongue and groove buttered with 1:2 cement mortar (ASTM C270, Type M). A precast eccentric cone, or precast slab where shown, shall be provided at the top of the manhole barrel to receive the frame and cover. The slab or cover shall be designed for an H-20 loading.
- G. Precast manhole units shall be coated on the exterior with a two-coat application of polyamide-cured epoxy-coal tar. Application shall meet manufacturer's recommendations. Do not apply the polyamide-cured epoxy-coal tar within 28 days of concrete manufacture. Epoxy-coal tar to be as manufactured by Coopers Creek Chemical Corporation, Cooper Black #775 Epoxy Tar Coating or approved equal.

2.4 MANHOLE STEPS

- A. Manhole sections shall contain manhole steps at 12 inches on center for all structures over 3 feet 6 inches in height. The steps shall be embedded in the concrete and accurately positioned both vertically and horizontally.

- B. Steps shall be capable of withstanding a 300-pound concentrated live load without permanent distortion, conforming to the requirements of ANSI A14.3, OSHA, and the details shown on the Drawings.
- C. Manhole rungs shall be steel reinforced copolymer polypropylene plastic. Rungs shall be 14 in. wide, M.A. Industries type PS2-PF, or equal. Copolymer polypropylene shall be type II, grade 16906 meeting ASTM D4101. Steel reinforcing shall be 3/8-inch diameter, Grade 60 conforming to ASTM A615 and shall be continuous throughout the rung. The portion of the legs to be embedded in the precast section shall have fins and be tapered to insure a secure bond.
- D. Frames and covers shall be as shown on the Drawings. Otherwise, conform to the standard detail of the regulatory authorities having jurisdiction for the project (if applicable). Access clear width shall be a minimum of 24-inches.

2.5 FRAMES AND COVERS / GRATES

- A. Frames and covers / grates shall be cast iron, ASTM A48, Class 30, free from flaws or unsightly defects.
- B. Frames and covers shall conform to the details on the Drawings and have “SANITARY SEWER” or “STORM SEWER” cast on every cover.
- C. Frames and covers / grates shall be designed for an H-20 loading and be machined to ensure correct fit and even bearing.
- D. Frames and covers / grates shall be as shown on the on the Drawings. Otherwise, conform to the standard detail of the regulatory authorities having jurisdiction for the project (if applicable).

2.6 GRADE ADJUSTMENTS

- A. Grade Rings: Reinforced-concrete rings, 3- to 12-inch (75- to 300-mm) total thickness, to match diameter of manhole frame and cover.

2.7 GROUT

- A. Description: ASTM C1107, Grade B. nonshrink and nonmetallic, dry hydraulic-cement grout.
 - 1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
 - 2. Design Mix: 5000 psi (34.5 MPa), 28-day compressive strength.
 - 3. Packaging: Premixed and factory packaged.

2.8 DROP INLET

- A. Drop inlets for manholes shall be constructed where shown on the Drawings and shall conform with the details shown on the Drawings.
- B. Pipe and fittings shall be the same type and class as the sewer pipe beings installed.
- C. Concrete for pipe encasement shall be 3,000 psi.

PART 3 – EXECUTION

3.1 EARTHWORK

- A. Earthwork shall be in accordance with Section “Trenching and Backfilling” or Section “Earth Moving.”

3.2 PRECAST MANHOLE SECTIONS

- A. Base units shall be placed on a minimum 12-inch foundation of pipe zone bedding material, and be set at the proper elevation, carefully leveled, and aligned.
- B. Barrel units shall be set vertical with steps and sections in proper alignment. All joints shall be sealed with cement mortar inside and out, and troweled smooth to the contour of the wall surface. Joints shall be installed in accordance with manufacturer’s recommendations.
- C. Lifting holes shall be sealed tight with a tapered solid rubber plug driven into the hole and the remaining void filled with mortar on the outside only.

3.3 GRADE RINGS

- A. Grade rings placed upon the eccentric cone or slab shall be used for all manholes to provide the potential for future adjustment.
- B. Grade rings shall be placed in a combined thickness of at least 4 inches but not more than 12 inches in order to bring the manhole frame to proper grade.
- C. Consecutive grade ring layers shall be laid on an even mortar bed.

3.4 PIPE CONNECTIONS

- A. Pipe connections to manholes shall be installed true to line and grade as shown on the Drawings. Wall fittings shall be watertight, compatible with the sewer pipe joint. Connections shall conform to the details shown on the Drawings.

3.5 INVERT CHANNEL AND BENCH WALLS

- A. An invert channel and bench walls shall be constructed as shown on the Drawings to provide a smooth transition in flow through the manhole. The invert channel and bench wall shall be constructed of 3,000 psi concrete. Benches shall be built-up to the height called for on the Drawings, or as directed by the Engineer, and given a steel trowel finish. Care shall be taken to slope all benches for proper drainage to the invert channel.

3.6 FRAMES

- A. Frames shall be firmly set and bonded at the proper grade to conform with the finished grade shown on the Drawings.
- B. Frames for manholes in unpaved areas shall be set at an elevation higher than finished grade as shown on the Drawings or as directed by the Engineer.

3.7 WATERTIGHTNESS

- A. All manholes shall be free of visible leakage. Each manhole shall be inspected, and all leaks shall be repaired in a manner approved by the Engineer.
- B. Testing: Manhole Negative Air Pressure (Vacuum) Test shall be performed prior to backfilling and in accordance with ASTM C1244.
 - 1. Preparation of manhole
 - 2. All lift holes shall be plugged.
 - 3. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipe and plugs to prevent them from being drawn into the manhole during testing.
 - 4. Procedure
 - 5. The test apparatus shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.
 - 6. A vacuum of 10 inches (254 mm) of mercury shall be drawn on the manhole. The valve on the vacuum line of the test apparatus shall be closed and the vacuum pump shut off.
 - 7. The time shall be recorded for the vacuum to drop to 9 inches (229 mm).
 - 8. If the time recorded exceeds the values in the following table, based on the manhole's depth and diameter, the manhole is acceptable.

DEPTH (FT)	DIAMETER (IN.)		
	48"	60"	72"
	TIME (SEC.)		
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97

3.8 CONNECTION TO EXISTING STRUCTURES

- A. The Contractor shall make connections to existing manholes as shown on the Drawings or as specified herein.
- B. For connections to precast or cast-in-place concrete manholes, the Contractor shall core drill a hole 1 inch larger than the O.D. of the sewer pipe into the existing manhole at the location and elevation shown on the Drawings.
- C. For connections to masonry manholes, the Contractor shall open the sidewall of the existing manhole by removing masonry units no more than necessary to accommodate the sewer pipe.
- D. Connection methods shall be in accordance with the details shown on the Drawings. Any open spaces around the new pipe entry shall be sealed with non-shrink grout to prevent leakage.

- E. The existing bench and channel shall be removed and reconstructed to permit flow through the manhole as it now exists and also for the new sewer pipe. Bench and channel reconstruction shall conform with the details on the Drawings, or as directed by the Engineer.
- F. The Contractor shall be responsible for diverting flow through the manhole in order to allow bench and channel construction.

3.9 CHANGING ELEVATIONS OF EXISTING STRUCTURES

- A. Lower existing frames of manholes by the removal of appropriate masonry courses, to the elevations shown on the Drawings or as directed by the Engineer.
- B. Raise the existing frames of manholes by the addition appropriate grade rings to the elevations shown on the Drawings or as directed by the Engineer.
- C. Where the manhole frames cannot be lowered by removal of masonry courses, such as may be the case with precast concrete manholes, the upper barrel section shall be removed and/or replaced with a section of less depth, to permit the necessary adjustment of the frame.
- D. Frames and covers damaged during the Work shall be replaced at the Contractor's expense.

END OF SECTION

SECTION 334100.20 – HIGH DENSITY POLYETHYLENE STORM UTILITY DRAINAGE PIPING

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the installation of polyethylene piping systems as shown on the Drawings and as specified herein.
- B. All piping, fittings, and appurtenances shall be new, clean, and in accordance with material specifications. In no instance shall second- hand or damaged materials be acceptable.

1.2 QUALITY ASSURANCE

- A. Reference Standards:
 - 1. The latest edition of the following standards, as referenced herein, shall be applicable:
 - a. Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering.
 - b. Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO).
 - c. American Society of Testing and Materials (ASTM).

1.3 SUBMITTALS

- A. Product Data:
 - 1. Submit manufacturer's catalog cuts, specifications, and installation instructions for both pipe and coupling system.
 - 2. Submit manufacturer's certification that product was manufactured, tested, and supplied in accordance with the standards specified herein.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Storage:
 - 1. Pipe, fittings, specials, appurtenances, and accessories shall be delivered to and stored within the Contractor's work limits as shown on the Drawings.
 - 2. Special care shall be exercised during delivery and storage to avoid damage to the products.
 - 3. Products shall be stored so as to avoid unnecessary handling and in locations where they will not interfere with the Owner's operations or public travel.
- B. Handling:
 - 1. Pipe, fittings, special appurtenances, and accessories shall be handled carefully with approved handling devices in strict conformance with the manufacturer's recommendations.
 - 2. Products shall not be dropped nor shall products be otherwise dragged, rolled, or skidded.
- C. Products cracked, gouged, chipped, dented, or otherwise damaged will not be approved and shall be removed and replaced at the Contractor's expense, unless the product can be repaired in a manner acceptable to the manufacturer and Engineer. All repairs shall be at the Contractor's expense.

PART 2 – PRODUCTS

2.1 MATERIALS

A. HDPE Soil Tight Pipe:

1. Pipe shall be ADS N-12 ST IB (per AASHTO) smooth interior with annular exterior corrugations and a Manning’s “n” value of 0.012 high-density polyethylene pipe (HDPE) as manufactured by Advanced Drainage Systems (ADS) or approved equal. Pipe shall have an integral soil tight gasketed bell and spigot.
 - a. 4 inches through 11 inches conforming to AASHTO M252 Type S.
 - b. 12 inches through 60 inches conforming to AASHTO M294 Type S or ASTM F2306.
2. Pipe shall be joined using a bell and spigot joint meeting AASHTO M252, M294, or ASTM F2306]. The joint shall be soil-tight and gasketed and shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.
3. Fittings shall conform to ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the soil-tight joint performance requirements of ASTM F2306.

B. HDPE Water Tight Pipe:

1. Pipe shall be ADS N-12 WT IB (per AASHTO) smooth interior with annular exterior corrugations and a Manning’s “n” value of 0.012 high-density polyethylene pipe (HDPE) as manufactured by Advanced Drainage Systems (ADS) or approved equal. Pipe shall have an integral water tight gasketed bell and spigot or approved equal.
 - a. 4 inches through 11 inches conforming to AASHTO M252 Type S.
 - b. 12 inches through 60 inches conforming to AASHTO M294 Type S or ASTM F2306.
2. 4 inches through 60 inches (100 to 1500 mm) shall be watertight according to the requirements of ASTM D3212. Gaskets shall be made of polyisoprene meeting the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly 12- through 60-inch (300 to 1500 mm) diameters shall have a reinforced bell with a bell tolerance device. The bell tolerance device shall be installed by the manufacturer.
3. Fittings shall conform to ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the water-tight joint performance requirements of ASTM F2306.

C. Flared End Section:

1. Flared end sections shall be 1210 NP or 1810 NP HDPE end sections as manufactured by ADS or equal.
2. End sections shall be fastened to the last corrugation of the pipe length using a high strength nylon cable tie supplied by the manufacturer through pre-drilled holes at the top of the end section collar.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Inspect all pipe and fittings prior to laying in the trench. Remove defective pipe and fittings from the site.

B. Do not backfill until inspection by the Engineer, unless otherwise approved by the Engineer.

3.2 INSTALLATION AND TESTING

A. Trenching, backfilling and compaction shall conform to Section “Trenching and Backfilling.”

B. Pipe installation and testing shall conform to Section “Common Work Results for Utilities.”

END OF SECTION

