

Bid Reference No. 2382

Book No. _____

**ONEIDA COUNTY DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING**

**SPECIFICATION BOOK
FOR
BID REFERENCE NO. 2382**

REBID

ORISKANY FUEL STORAGE DISPENSING FACILITIES

**5999 JUDD ROAD
TOWN OF WHITESTOWN
ONEIDA COUNTY
STATE OF NEW YORK**

**BID PACKAGES:
GENERAL CONSTRUCTION – CONTRACT NO. H2555801
ELECTRICAL CONSTRUCTION – CONTRACT NO. H2555802**

AUGUST 4, 2026

It is a violation of the New York State Education Law, Article 145 §7209 Special Provisions, for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect, or land surveyor, to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering professional shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.

**ASSEMBLED BY
BARTON & LOGUIDICE, D.P.C.
443 ELECTRONICS PKWY
LIVERPOOL, NY 13088**

**ANTHONY J. PICENTE, JR.
ONEIDA COUNTY EXECUTIVE**

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++ END OF SECTION ++

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 Thursday, August 20, 2026, and then publicly opened and read, for furnishing all labor and materials and performing all work for:

Bid Reference No. 2382
REBID
Oriskany Fuel Storage Dispensing Facilities
5999 Judd Road
Whitestown, New York
General Construction: Contract No. H2555801
Electrical Construction Contract No. H2555802

Specifications and plans must be obtained from Oneida County Purchasing Department, 800 Park Avenue, Utica, New York 13501. Full size drawings are on 22" x 34" paper. 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 total bid (the sum of the base bid plus the bid for Alternate 01) 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 and Payment Bond will be required and for an amount not less than 100% of the bid price.

A pre-bid meeting will be held at the Oneida County Department of Public Works Building, 5999 Judd Road, Oriskany New York 13424 on Tuesday, August 11, 2026, at 10:30 AM. All bidders attending the pre-bid meeting shall meet at the main entrance doors on the east side of the building facing the existing fuel island.

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:

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
August 4, 2026

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 Debits 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.

DRAFT AIA® Document A701® – 2018

Instructions to Bidders

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

Bid Reference Number 2382
REBID
Oriskany Fuel Storage Dispensing Facilities
5999 Judd Road
Whitestown, New York

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

Oneida County
800 Park Avenue,
Utica, NY 13501

THE ARCHITECT AND/OR ENGINEER:
(Name, legal status, address, and other information)

Barton & Loguidice, D.P.C., a New York domestic professional services corporation
443 Electronics Parkway
Liverpool, New York 13088

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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.

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.

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.

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, 800 Park Avenue, Utica, NY 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-Bidders, 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.)

Commissioner
Oneida County Department of Public Works
5999 Judd Road
Oriskany, NY 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 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 total bid (the sum of the base bid plus the bid for Alternate 01).

§ 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 ~~«~~ »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.

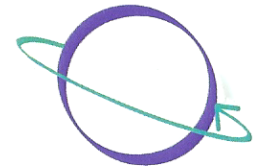
§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 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 Paragraph Deleted.



GEOTECHNICAL DATA REPORT



Kenney Geotechnical
Services

Kenney Geotechnical Engineering Services PLLC

Geotechnical Evaluation Report

Oneida County Public Works
Fuel Storage Dispensing Facilities
5999 Judd Road
Oriskany, New York



C.M. Kenney, PE
1-11-2024

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INTRODUCTION

This report presents the analysis of the geotechnical investigation performed for the proposed fuel island canopy system at the Oneida County Public Works Facility. This geotechnical report analyzes the data developed during the subsurface investigation and provides recommendations for the proposed construction.

No environmental services are included in this study. No conclusions have been drawn regarding environmental conditions of the site, potential contaminants, potential special treatment or disposal of site materials, or other environmental considerations.

AUTHORIZATION

Our services were authorized by Barton & Loguidice D.P.C. (B&L) subconsultant agreement dated November 13, 2023.

PROJECT DESCRIPTION

Based upon information received from B&L we understand that a canopy is to be constructed at the location illustrated in the following figure:



DESIGN CRITERIA

Design criteria provided by B&L indicate:

- Risk Category IV structure
- Square concrete pier foundation
- Compressive, uplift, and seismic loading considered
- Design reactions not available at the time of this report.

The following ASTM Standards were utilized during this study:

- ASTM D1586 “Penetration Test and Split-Barrel Sampling of Soils”
- ASTM D2487 “Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)”
- ASTM D5434 “Standard Guide for Field Logging of Subsurface Exploration of Soil and Rock”

Local geotechnical practice was followed in the performance of this study. We assumed a tolerable foundation settlement of one inch in our analysis.

SITE CONDITIONS

The proposed project areas were open lawn and pavement areas with little topographic relief at the time of the subsurface investigation. The site is located within the Ontario Lowlands Plateau physiographic province. Major topographic and geologic features in this area were formed during the last glacial advance and retreat, which ended approximately 12,000 years ago. Regional surficial geologic mapping suggests that natural soils in the site vicinity generally consist of glacial till deposits. Bedrock mapping suggests that Clinton Group shale and sandstone underlies soil in the area.

FIELD STUDY

The subsurface investigation for this project consisted of two test borings designated B-1 and B-2. The test borings were performed by Lyon Drilling Company under contract with B&L. Borings were on November 30, 2023 using a truck-mounted CME 55 drill rig. Hollow stem auger techniques were utilized to advance the borings to a maximum depth of 25.1 feet. Standard penetration testing (ASTM D1586) was performed with a standard safety hammer and cathead to obtain soil samples. Boring locations were selected by B&L and field located by Lyon Drilling Company.

Boring logs prepared by Lyon Drilling Company documenting the subsurface conditions encountered are attached. The boring logs and related information depict subsurface conditions only at the specific locations and times indicated. Subsurface conditions and water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time also may result in changes in the conditions interpreted to exist at the locations where sampling was performed.

LABORATORY TESTING

Laboratory testing was not performed for this investigation.

SUBSURFACE CONDITIONS ENCOUNTERED

The following interpretation of subsurface conditions is based on our review of the recovered samples, the boring logs, drilling observations, and our professional experience.

The subsurface conditions encountered generally consisted of:

- Asphalt or gravelly sand fill to a depth of 0.6 feet, overlying

- Medium dense to very dense gravelly sand to depths of 3.5 feet to 11 feet; overlying
- Very dense grey glacial till to depths of 14.7 feet to more than 25 feet.

The glacial till extended to the limit of exploration (25.1 feet) at boring location B-2. The glacial till was underlain by soft laminated shale at a depth of 14.7 feet at B-1.

Water levels were measured within the augers during advancement and from the open borehole after the augers were removed. The following table summarizes the water levels measurements provided by Lyon Drilling Company.

Boring Location	Depth of Water Within the Augers at Boring Completion (ft)
B-1	2.0
B-2	14.2

Lyon Drilling Company noted that the groundwater rose to within two feet of the ground surface after sampling at depth of 15 feet at boring location B-1. This boring was grouted to a depth of five feet upon completion. Groundwater depths and seepage rates will vary with the seasons and changes in precipitation patterns and may be higher during the wetter seasons. No long-term groundwater data was generated during this study and the range of possible groundwater elevation is unknown.

RECOMMENDATIONS AND CONCLUSIONS

A. Geotechnical Analysis

The soil encountered is adequate for supporting a shallow foundation system. The on-site sand and gravel may also be utilized as structural fill pending field review to ascertain silt content.

B. Foundations

An allowable bearing pressure of 3,500 pounds per square foot (psf) is recommended for the design of shallow foundations bearing on medium dense to very dense gravelly sand. Foundation bearing grade must be reviewed by geotechnical personnel to verify the strength of the soil. Any disturbed or saturated soil must be removed from below foundation bearing grade. Proper management of the soil will be critical during foundation construction and earthwork.

Geotechnical personnel must review the bearing grade to ensure that the assumptions made based upon the findings of the subsurface conditions are consistent with the ground conditions exposed during foundation excavation. Undercutting may be necessary where the bearing material is considered unacceptable by on-site geotechnical personnel. All exterior footings should bear at least 48 inches below finished exterior grade for frost protection unless an insulated frost protection system is installed.

We estimate that foundations designed as recommended herein and properly managed during construction will undergo total settlements of less than one inch.

C. Temporary Excavations

Temporary excavation slopes must be evaluated by the Contractor's on-site Responsible Person. We anticipate on-site soil material will be classified as Type C. Type C materials must be graded to slopes no greater than 1.5:1 (horizontal to vertical). The Contractor's on-site Responsible Person should periodically review excavations for signs of movement or distress. Excavation sidewalls should be periodically raked to remove loose particles.

D. Earthwork

Earthwork must be performed using methods that will result in a stable excavations and fills. Typical temporary earthwork measures such as temporary drainage swales and the use of protective layers of crushed stone can be employed at this site. It is recommended that earthwork is observed by geotechnical personnel to ensure that all organic material is removed from the structural and pavement site. Additional recommendations are as follows:

- Strip existing topsoil, pavement, roots and organics from all areas that will receive new construction to establish subgrade.
- Proof-roll exposed pavement subgrade with a fully loaded dump truck, or accepted alternative equipment, under the observation of geotechnical personnel. Areas that rut, weave, or deflect should be over-excavated and replaced with compacted structural fill (see below for structural fill characteristic requirements).
- Utilize structural fill to raise site grades up to one foot. Structural fill should consist of imported granular material conforming to NYSDOT

Subbase Course (2" minus) or approved equal. On-site material can potentially be utilized as structural fill pending field review by geotechnical personnel.

- Field moisture contents for structural fill should be maintained within 2 percentage points of the optimum moisture content established by laboratory testing to provide adequate compaction. All fill should be placed in level lifts having a loose thickness no greater than 12 inches and should be compacted to at least the following minimum percentages of the Modified Proctor (ASTM D-1557) maximum dry density:

• Below footings:	95%
• Beneath slab-on-grade or pavements:	95%
• Utility trench backfill:	95%
• Beneath landscape areas:	90%
• Beneath sidewalks and exterior slabs:	95%

Bulk samples of proposed structural fill materials should be delivered to our testing laboratory at least two weeks prior to the initiation of earthwork. In-place density testing should be performed at a frequency of one test per 500 square feet per lift in open areas and one test per 25 feet per lift in trenches.

- If the structure is to be constructed during the winter months, or if the building interiors will be subjected to freezing temperatures after footer construction, adequate frost cover and protection must be provided. Earthwork cannot be performed with frozen material.
- Permanent slopes should be graded no steeper than 3 horizontal: 1 vertical.

In utility trenches, or other confined areas, small compaction equipment may be necessary such as a vibratory plate, jumping jack or walk-behind vibratory roller. In-place density testing should be performed at a frequency of one test per 25 feet per lift in trenches. Utility trench fill should be placed in level lifts no greater than 8 inches in thickness and should be compacted to at least 95% the Modified Proctor (ASTM D-1557) maximum dry density. Structural fill should consist of imported granular material such as NYSDOT Subbase (2" minus) or approved equal. Adequate frost cover and protection must be provided during winter weather construction. Earthwork cannot be performed with frozen material.

E. Groundwater Seepage and Management

Artesian groundwater was encountered at a depth of approximately 15 feet at Boring location B-1 when the shale surface was penetrated. It appears the shale slopes significantly as it was not encountered at B-2, which was advanced to a depth of 25 feet. However, the soil below a depth of 11 feet was wet at B-2.

Storm events and other factors will also affect groundwater and seepage during construction. We anticipate that temporary dewatering measures, such as sump and pump methods, will be necessary to control groundwater for shallow excavations. All dewatering discharge should be transported to a temporary dewatering basin constructed consistent with NYDEC construction stormwater and/or dewatering treatment Best Management Practices (BMPs).

F. Concrete Slabs on Grade

All topsoil, pavement, organic matter, roots, etc. must be removed from beneath the concrete slab on grade subgrade. All subgrade areas should be proof-rolled as discussed in the Earthwork recommendations. A preliminary subgrade modulus of 250 pci is suggested for design and assumes compacted structural fill is installed over stripped subgrade to achieve new slab elevations. Structural fill placed to establish slab subgrade should conform to the recommendations for materials and compaction presented in the Earthwork recommendations.

The subbase for the slab-on-grade should consist of a minimum of 6 inches of gravel or crushed stone conforming to NYSDOT specifications for Item 304-2.02 Type 2 or 4. Follow compaction requirements presented for earthwork.

G. Lateral Earth Pressures

Design of subsurface walls subjected to lateral earth pressure must consider the type of wall, degree of restraint against wall rotation, and other factors. We suggest the following lateral earth pressure parameters for smooth walls with horizontal backfill:

- $K_a = 0.33$
- $K_p = 3.0$
- $K_o = 0.5$
- Coefficient of friction = 0.55
- Soil moist unit weight = 135 pcf

Any water pressure or surcharges from equipment, material stockpiles, or adjacent structures must be added to the suggested lateral pressure.

It is recommended that drainage is provided for all walls to reduce hydrostatic wall loading and possible frost action. Backfill against any walls should consist of a relatively well-graded free-draining granular material having no more than 10% passing the No. 200 sieve. The granular backfill zone behind walls should be at least one foot wide as measured horizontally from the face of the wall. Backfill against walls should be placed in loose lifts no greater than 6 inches in thickness. A nonwoven geotextile filter should be placed between the granular backfill and in-situ soil to prevent the migration of fine-grained soil.

H. Seismic Hazard Concerns, Liquefaction, Seismicity, and Faulting

Correlations with Standard Penetration Testing “N” values recorded during the subsurface investigation suggest that seismic **Site Class C** is appropriate for this site. The estimated design spectral response acceleration parameters are $S_{Ds} = 0.151g$ and $S_{D1} = 0.0057g$ assuming ASCE 7-16 as the design reference and Risk Category IV. Liquefaction, surface rupture from faulting or lateral spreading is estimated to have a low probability of occurrence given typical regional seismicity.

LIMITATIONS

The recommendations presented in this report are predicated on the performance of construction observation and testing by qualified geotechnical personnel. We request continued involvement with this project so that we may assess subsurface conditions exposed during construction to determine if modifications to our recommendations are necessary.

REFERENCES

“Surficial Geologic Map of New York – Hudson Mohawk Sheet”, New York State Museum, 1986.

“Bedrock Map of New York – Hudson Mohawk Sheet”, New York State Museum, 1970.

ATTACHMENTS

Boring Location Map

Boring Log Key
Boring Logs

Project:

Project Location:

Project Number:

Key to Soil Symbols and Terms

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	Relative Density	SPT Blow Count
Very loose	0 to 15 %	< 4
Loose	15 to 35 %	4 to 10
Medium dense	35 to 65 %	10 to 30
Dense	65 to 85 %	30 to 50
Very dense	85 to 100 %	> 50

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

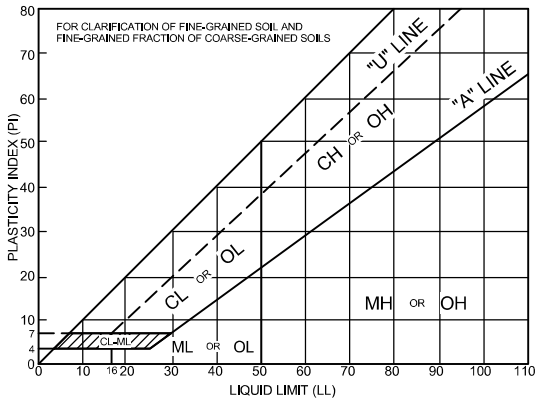
Descriptive Terms	Unconfined Compressive Strength kPa	SPT Blow Count
Very soft	< 25	< 2
Soft	25 to 50	2 to 4
Medium stiff	50 to 100	4 to 8
Stiff	100 to 200	8 to 15
Very stiff	200 to 400	15 to 30
Hard	> 400	> 30

GENERAL NOTES

1. Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.

2. Surface elevations are based on topographic maps and estimated locations.

3. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were made. They are not guaranteed to be representative of subsurface conditions at other locations or times.

Major Divisions		Group Symbols	Typical Names	Laboratory Classification Criteria		Particle Size	Material
Coarse-Grained soils (More than half the material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	Not meeting all gradation requirements for GW	Sieve sizes < #200	#200 to #40 #40 to #10 #10 to #4
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines				
		GM* d u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols	mm < 0.074	0.074 to 0.42 0.42 to 2.00 2.00 to 4.76
		GC	Clayey gravels, gravel-sand-silt mixtures	Atterberg limits above "A" line or P.I. greater than 7			
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	Not meeting all gradation requirements for SW	Material Silt or clay Sand Fine Medium Coarse	
		SP	Poorly-graded sands, gravelly sands, little or no fines				
		SM* d u	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols		
Fine-Grained soils (More than half the material is smaller than No. 200 sieve size)	Sands with fines (Appreciable amount of fines)	SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line or P.I. greater than 7			
	Silt and Clays (Liquid limit less than 60)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity			Particle Size mm Sieve	#4 to 3/4 in. 3/4 in. to 3 in. 3 in. to 12 in. 12 in. to 36 in.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays				
		OL	Organic silts and organic silty clays of low plasticity				
	Silt and Clays (Liquid limit greater than 60)	MH	Inorganic silts, micaceous or disto-maceous fine sandy or silty soils, organic silts				
		CH	Inorganic clays of high plasticity, fat clays				
		OH	Organic clays of medium to high plasticity, organic silts				
	Highly Organic Soils	Pt	Peat and other highly organic soils				

* Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg Limits: suffix d used when L.L. is 23 or less and the P.I. is 6 or less; the suffix u is used when L.L. is greater than 26.

** Borderline classifications used for soils possessing characteristics of two groups are designated by combinations of group symbols. For example; GW-GC, well-graded gravel-sand mixture with clay binder.



Client <u>BARTON & LOGUIDICE</u> PC _____ Project <u>ONEIDA CO. FUEL STORAGE</u> DISPENSING FACILITIES Location <u>5999 JUDD ROAD,</u> <u>ORISKANY, NY</u>		LYON DRILLING CO. BORING LOG	Boring No. <u>B2</u> Project No. <u>197.064.001</u> Sheet <u>1</u> of <u>1</u> Date Started <u>12/01/23</u> Date Completed <u>12/01/23</u> Driller <u>HARRY LYON</u>

Drill Rig <u>CME 55</u> Casing <u>3 1/4" I.D. HOLLOW STEM AUGERS</u> Casing Hammer: Wt. _____ lb. Fall _____ in. Soil Sampler <u>2" SPLIT SPOON</u> Sample Hammer: Wt. <u>140</u> lb. Fall <u>30</u> in. Rock Sampler: _____ Other: _____ Weather Conditions: <u>40 OVERCAST</u>	Boring Location <u>AS STAKED, BY CLIENT NORTH WEST SIDE</u> Surface Elevation _____ <table style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Ground Water Observations</th> </tr> <tr> <th style="width:20%;">Date</th> <th style="width:20%;">Time</th> <th style="width:20%;">Casing at</th> <th style="width:20%;">Hole at</th> <th style="width:20%;">Water at</th> </tr> <tr> <td><u>12/01/23</u></td> <td><u>3:00 PM</u></td> <td><u>23.5</u></td> <td><u>25.1</u></td> <td><u>14.2</u></td> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	Ground Water Observations					Date	Time	Casing at	Hole at	Water at	<u>12/01/23</u>	<u>3:00 PM</u>	<u>23.5</u>	<u>25.1</u>	<u>14.2</u>																									
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Depth	Sample Number	Sample Depth		Sample Type	SOIL				RQD	Sample Recovery	MATERIAL DESCRIPTION	Depth of Change	REMARKS
		From (Ft)	To (Ft)		Blows on Sampler								
					0'/0.5'	0.5'/1.0'	1.0'/1.5'	1.5'/2.0'					
					Rock Recovery		Ft.	%					
1	0.0	2.0	S	8	6	9			9	15	1.3	MOIST BROWN LOOSE COARSE TO FINE SAND AND FINE GRAVEL. TRACE BLACKTOP (FILL)	0.6
2	2.0	4.0	S	5	10	9	8	19	1.0	MOIST BROWN FIRM FINE TO COARSE SAND LITTLE SILT. TRACE CLAY. TRACE FINE GRAVEL	3.0		
3	4.0	6.0	S	9	35	16	16	51	1.1	GRADES TO MOIST BROWN FIRM FINE TO COARSE SAND. SOME FINE GRAVEL			
4	6.0	7.4	S	23	23	50/4			1.2				
5	8.0	9.8	S	12	27	38	50/3	65	1.4				
6	10.0	10.9	S	24	50/4				0.6		11.0		
7	12.0	13.3	S	43	47	50/3			1.0	SATURATED GREY COMPACT FINE TO COARSE SAND AND FINE GRAVEL (TILL LIKE MATERIAL)			
8	14.0	15.7	S	16	28	45	50/2	73	1.2				
9	16.0	16.8	S	40	50/3				0.6				
10	18.0	18.3	S	50/3					0.3				
11	20.0	20.7	S	48	50/2				0.6				
12	22.0	23.9	S	20	31	20	50/4	51	1.5				
13	24.0	25.1	S	31	44	50/1			0.7				
BORING TERMINATED AT 25.1												BORING GROUTED UPON COMPLETION TO 5.0	

HAZARDOUS MATERIALS SURVEY

November 17, 2023

Nicholas DiGennaro, P.E., CFM
Deputy Commissioner
Oneida County Department of Public Works
Division of Engineering
5999 Judd Road
Oriskany, New York 13424

Re: Pre-Demolition Asbestos Survey and Lead Paint Characterization
DPW Fuel Storage Dispensing Facility, 5999 Judd Road, Oriskany, NY

File: 197.064.001

Dear Mr. DiGennaro:

This letter and attachments represent Barton & Loguidice, D.P.C.'s (B&L's) report for the above-referenced project.

Introduction

B&L was retained by Oneida County to conduct a pre-demolition asbestos survey and lead-based paint characterization at the Oneida County DPW facility located at 5999 Judd Road, Oriskany, New York. The investigation included all accessible areas of the fuel storage dispensing facility.

The survey was conducted by Michael Goff of B&L on November 3, 2023. Mr. Goff is a New York State Department of Labor (DOL) certified asbestos inspector. A copy of the inspector's certification and B&L's company license are provided in Appendix A.

Discussion and Results

Asbestos Sampling

The survey included the existing fuel storage tanks, fuel pumps, secondary fuel containment and canopy. No suspect asbestos containing materials were noted in our investigation.

Lead Based-Paint Sampling

The lead-based paint characterization included the collection of two paint chip samples and was comprised of all layers. The lead-based paint laboratory report is included in Appendix B and the paint sample results are summarized in the table below.

Lead-Based Paint Sample Results							
Sample Number	Structure	Painted Component	Component Substrate	Color	Condition	Location	Result (% lead)
P-1	Fuel Storage Facility	Tank/Pump	Metal	White	Poor	Exterior	<0.0047
P-2		Column	Metal	Grey	Fair	Exterior	<0.0043

In the table above, the samples collected have been listed along with the location, component, substrate, color, condition and laboratory result. Sample locations are illustrated in the attached figure. **The samples collected are not considered lead-based paint by the US Environmental Protection Agency (EPA – HUD) definition (greater than 0.5 % by weight).** The Occupational Safety & Health Administration (OSHA) considers paint with any concentration of lead to fall under the OSHA Construction Standard for lead. Contractors disturbing lead-based or lead-containing paint must comply with this Standard cited in - 29 CFR 1926.62. Contractors must also comply with lead-based paint collection and disposal as required by the New York State Department of Environmental Conservation (DEC). The DEC requires that loose and peeling paint to be containerized and disposed of based on the results of a Toxicity Characteristic Leaching Procedure (TCLP) test. Collected paint chips cannot be disposed of directly as C&D waste.

If you have any questions, please call me at (585) 325-7190. It was a pleasure working with you on this project and I hope we can be of service in the future.

Sincerely,

BARTON & LOGUIDICE, D.P.C.



Michael D. Goff
Staff Industrial Hygienist



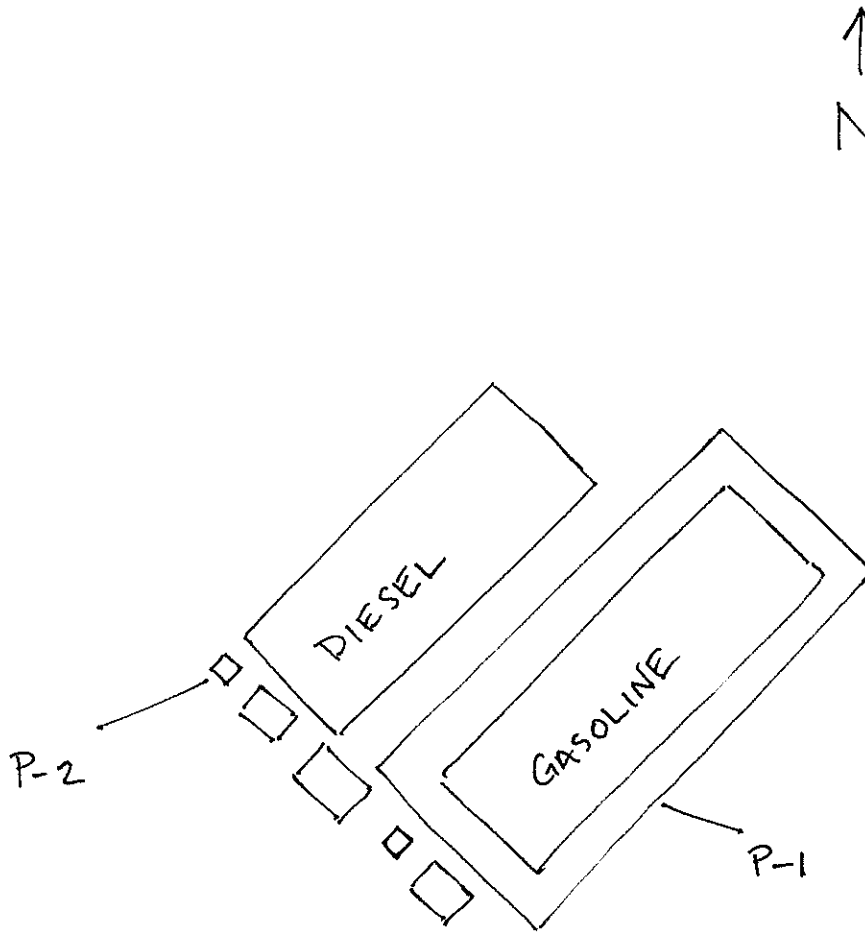
John E. Rigge
Vice President

MDG/JER/jms

Attachments

Sample Location Figure

JOB ONEIDA Co. DPW GARAGE
SHEET NO. Refueling Station
CALCULATED BY _____ DATE _____
CHECKED BY Judd Rd. DATE _____
DESCRIPTION 197.064.001



Appendix A

NYSDOL Inspector Certification and Company License

WE ARE YOUR DOL



**Department
of Labor**

DIVISION OF SAFETY & HEALTH LICENSE AND CERTIFICATE UNIT, STATE OFFICE CAMPUS, BLDG. 12, ALBANY, NY 12226

ASBESTOS HANDLING LICENSE

Barton & Loguidice, D.P.C.
443 Electronics Parkway, Liverpool, NY, 13088

License Number: 29267

License Class: RESTRICTED

Date of Issue: 02/03/2023

Expiration Date: 02/29/2024

Duly Authorized Representative: Scott D Nostrand

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

EXCELSIOR

STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE



MICHAEL GOFF

CLASS(EXPIRES)

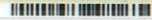
C ATEC (12/24) D INSP (12/24)

H PM (12/24)

CERT# 23-6LXR6-SHAB

DMV# [REDACTED]

MUST BE CARRIED ON ASBESTOS PROJECTS



Appendix B

Lead Paint Laboratory Reports and Sample Chain-of-Custody Forms



Tuesday, November 14, 2023

Attn: Mike Goff
Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, NY 13088

Project ID: ONEIDA COUNTY DPW FULE STORAGE STATION
SDG ID: GCP41163
Sample ID#s: CP41163 - CP41164

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Phyllis Shiller".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Sample Id Cross Reference

November 14, 2023

SDG I.D.: GCP41163

Project ID: ONEIDA COUNTY DPW FULE STORAGE STATION

Client Id	Lab Id	Matrix
P-1	CP41163	BULK
P-2	CP41164	BULK



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

November 14, 2023

FOR: Attn: Mike Goff
Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, NY 13088

Sample Information

Matrix: BULK
Location Code: BARTLOG
Rush Request: Standard
P.O.#: 197.064.001

Custody Information

Collected by: MDG
Received by: SR1
Analyzed by: see "By" below

Date

11/03/23
11/06/23

Time

10:35

Laboratory Data

SDG ID: GCP41163
Phoenix ID: CP41163

Project ID: ONEIDA COUNTY DPW FULE STORAGE STATION
Client ID: P-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Lead	< 0.0047	0.0047	%	1	11/13/23	CPP	SW6010D
Total Metals Digest	Completed				11/06/23	L/AG	SW3050B

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

November 14, 2023

Reviewed and Released by: Kathleen Cressia, QA/QC Officer



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

November 14, 2023

FOR: Attn: Mike Goff
Barton & Loguidice, D.P.C.
443 Electronics Parkway
Liverpool, NY 13088

Sample Information

Matrix: BULK
Location Code: BARTLOG
Rush Request: Standard
P.O.#: 197.064.001

Custody Information

Collected by: MDG
Received by: SR1
Analyzed by: see "By" below

Date

11/03/23
11/06/23

Time

10:35

Laboratory Data

SDG ID: GCP41163
Phoenix ID: CP41164

Project ID: ONEIDA COUNTY DPW FULE STORAGE STATION
Client ID: P-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Lead	< 0.0043	0.0043	%	1	11/13/23	CPP	SW6010D
Total Metals Digest	Completed				11/06/23	L/AG	SW3050B

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director

November 14, 2023

Reviewed and Released by: Kathleen Cressia, QA/QC Officer



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102



QA/QC Report

November 14, 2023

QA/QC Data

SDG I.D.: GCP41163

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 705217 (mg/kg), QC Sample No: CP41303 (CP41163, CP41164)													
<u>ICP Metals - Soil</u>													
Lead	BRL	0.33	46.5	47.3	1.70	104	103	1.0	99.9			75 - 125	35

Comment:

Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
November 14, 2023

Tuesday, November 14, 2023

Criteria: None
State: NY

Sample Criteria Exceedances Report
GCP41163 - BARTLOG

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

November 14, 2023

SDG I.D.: GCP41163

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



NY Temperature Narration

November 14, 2023

SDG I.D.: GCP41163

The samples in this delivery group were received at 19.3°C.
(Note acceptance criteria for relevant matrices is above freezing up to 6°C)

19.3 ONIC

Barton & Loguidice

Paint Sample Chain-of-Custody

443 Electronics Parkway
Liverpool, New York 13088
(315) 457-5200 Fax: (315) 451-0052

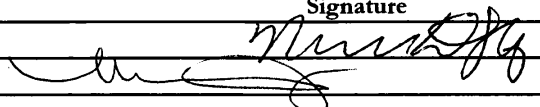
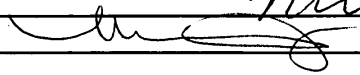
Project: **Oneida County**
DPW Fuel Storage Station
Oriskany, New York

Project No.: **197.064.001**
Date Sampled: **11/3/2023**
Sampled by: **MDG**

41163
41164

Sample Identification	Date Sampled	Sample Matrix	Analysis Required	Method Reference
P-1	11/3/2023	Paint	% Lead (by weight)	AAS (EPA 7420)
P-2	↓	Paint	% Lead (by weight)	AAS (EPA 7420)
/		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)
		Paint	% Lead (by weight)	AAS (EPA 7420)

Comments:

Report Results to:		
E-mail: Mike Goff	TAT: 7 Day	mgoff@bartonandloguidice.com
E-mail: Dave Morse		dmorse@bartonandloguidice.com
Written: John Rigge		10 calendar days
Invoice: John Rigge		10 calendar days
Chain-of-Custody:	Signature	Date
Relinquished by:		11/3/2023
Received by Lab.:		11/6/23 10:30
Received by Analyst:		

Fedex

DRAFT AIA® Document A101® – 2017

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

AGREEMENT, Bid Reference Number 2382 / Contract # « » made as of the « » day of « »
in the year Two Thousand and Twenty Six
(In words, indicate day, month and year.)

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

Oneida County
800 Park Avenue
Utica, NY 13501

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

« »
« »
« »
« »

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

Bid Reference Number 2382
REBID
Oneida County Department of Public Works
Oriskany Fuel Storage Dispensing Facilities
5999 Judd Road
Oriskany, NY 13424

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

Barton & Loguidice, D.P.C., a New York domestic professional services corporation
443 Electronics Pkwy
Liverpool, NY 13088

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.

TABLE OF ARTICLES

1	THE CONTRACT DOCUMENTS
2	THE WORK OF THIS CONTRACT
3	DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4	CONTRACT SUM
5	PAYMENTS
6	DISPUTE RESOLUTION
7	TERMINATION OR SUSPENSION
8	MISCELLANEOUS PROVISIONS
9	ENUMERATION OF CONTRACT DOCUMENTS
10	INDEMNIFICATION
11	INDEPENDENT CONTRACTOR STATUS
12	ADVICE OF COUNSEL
13	AUTHORITY TO ACT/SIGN
14	SEVERABILITY
15	COUNTERPARTS
16	ORDER OF PRECEDENCE
17	SUBCONTRACTS
18	REQUIRED PROVISIONS OF LAW
EXHIBIT A	STANDARD ONEIDA COUNTY CONDITIONS
EXHIBIT B	SIGNED PROPOSAL BOOKLET FOR BID REFERENCE NUMBER 2382

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 three hundred sixty (360) 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
Diesel Fueling Station	270 calendar days from the date of commencement of the Work. Existing Fueling Station shall remain operable until new Diesel Fueling Station is complete and operable.

§ 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

§ 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

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

Item	Price
General Construction Contingency Allowance - Contract No. H2555801	\$10,000.00

Electrical Construction Contingency
Allowance - Contract No. H2555802

\$30,000.00

§ 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)
Petroleum Contaminated Soils (Alternate 01)	Tons, 100	
Petroleum Contaminated Fluids (Alternate 01)	Gallons, 1500	

§ 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
- ☒ 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)

Deputy Commissioner of Engineering
Oneida County Department of Public Works
5999 Judd Road
Oriskany, NY 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 offices, 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 1.2.1. 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 1.2.3. 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 Contractor shall purchase and maintain a Pollution Liability Insurance policy with limits of at least Five Million Dollars (\$5,000,000). The policy shall cover third-party injury and property damage claims, including clean-up costs, as a results of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

§ 8.5.2.8 The Contractor shall provide and maintain an Installation Floater insurance policy covering all materials, equipment, machinery, and supplies to be used in the construction of the project. Coverage shall be on an 'all-risk' basis, including transit, storage, and installation, for the full contract value. The Owner shall be named as an additional insured and loss payee.

§ 8.5.2.9 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 and provisions regarding the same topic stated in any other Contract Document.

§ 8.5.5 A Performance Bond and a Material and Labor 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.

§ 8.5.5.4 The Contractor shall purchase and maintain insurance and provide bonds 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 a building information modeling exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with a building information modeling exhibit, 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

All Sheets

Title

Oneida County
Department of Public
Works – Oriskany Fuel
Storage Dispensing
Facilities

Date

- .6 Specifications

Section	Title	Date	Pages
All	Specification Book for Bid Reference No. 2382 Oneida County Department of Public Works – Oriskany Fuel Storage Dispensing Facilities		

.7 Addenda, if any:

Number	Date	Pages

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	Standard Oneida County Conditions		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 2382 Signed (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 COUNCIL

§ 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 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 2382

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 22-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)

REDACTED

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. Pollution Liability Insurance in the amount of not less than Five Million Dollars (\$5,000,000). The County shall be included as additional insured.

- 1.2.1.7. 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.
- 1.2.1.8. 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.

1.3. Bonds

- 1.3.1. A Performance Bond and a Material and Labor 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.
- 1.3.2. 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.
- 1.3.3. The County shall be named as beneficiaries on all bonds.

DRAFT AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

Oneida County Department of Public Works
Oriskany Fuel Storage Dispensing Facilities
5999 Judd Road, Oriskany, NY 13424
Bid Reference No. 2382
REBID

THE OWNER:
(Name, legal status and address)

Oneida County
800 Park Avenue
Utica, NY 13501

THE ARCHITECT/AND OR ENGINEER:
(Name, legal status and address)

Barton & Loguidice, D.P.C., a New York domestic professional services corporation
443 Electronics Pkwy
Liverpool NY 13088

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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.

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

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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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 written protocols governing the transmission and use of, and reliance on, Instruments of Service or any other information or documentation in digital form. The parties with 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 written 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 Section 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 it 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 resented is complete and includes all related costs under the Contract but excluded 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 seven 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 substances 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 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.

§ 11.2 Section Deleted.

§ 11.3 Section Deleted.

§ 11.4 Section Deleted.

§ 11.5 Section 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 Section Deleted

STANDARD ONEIDA COUNTY CONDITIONS

The County of Oneida ("County") and _____ ("Contractor"), for good consideration, agree to be bound by the following clauses which are hereby made a part of the foregoing Agreement:

1. **EXECUTORY OR NON-APPROPRIATION CLAUSE.**

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.**

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 2 CFR Part 180, for prospective participants in primary covered transactions, as defined at 13 CFR 400.109.
 - 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 2 CFR Part 182, Subpart B, for Contractors other than individuals.

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:

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 2 CFR Part 182, Subpart C, for Contractors that are individuals.

- 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:

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 (HIPPA).

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 principal 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.

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.

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.

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.

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.

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).

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.

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.

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.

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

- a. For the purposes of this provision, the “use of tobacco” shall include:
 - i. The burning of a lighted cigarette, pipe, cigar or other lighted instrument for the purpose of smoking tobacco or a tobacco substitute;
 - ii. 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.
- b. 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.
- c. For the purposes of this provision, “on Oneida County property” shall be defined as:

- i. Upon all real property owned or leased by the County of Oneida;
and
- ii. 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.

- d. 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.

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

21. COMPLIANCE WITH NEW YORK STATE LABOR LAW § 220-i.

If this contract is for a public work and is a covered project as set forth in Labor Law § 220-i, the Contractor shall at all times comply with, and shall require its subcontractors (if any) to comply with, Labor Law § 220-i. The Contractor and its subcontractors (if any) shall at all times be registered by the Department of Labor as set forth in Labor Law § 220-i. Should the registration of the Contractor or its subcontractors (if any) lapse during the term of the contract or subcontract, the Contractor and its subcontractors shall be subject to Labor Law § 220-i(5). Should a Contractor or subcontractor be determined by the Department of Labor to be unfit to be registered by the Department of Labor during the term of the contract or subcontract, then its work may continue only if a monitor is appointed to oversee the work completed at the sole expense of the Contractor or its subcontractor, as applicable. Such monitor must be approved by the Department of Labor.

(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 WAGE RATES

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). Wage rate amendments and supplements are available on the NYSDOL web site at <https://labor.ny.gov/workerprotection/publicwork/OWSaccess.shtm>. 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 is available on the internet. The prevailing wage rate schedule is accessed by visiting the NYSDOL website, navigating to the appropriate web page, and entering the Prevailing Rate Case No. (PRC# **2025003294**).

SEALS PAGE

ONEIDA COUNTY DEPARTMENT OF PUBLIC WORKS

ORISKANY FUEL STORAGE DISPENSING FACILITIES

REBID

I hereby certify that the following Specifications and Drawings were prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the Laws of the State of New York.

ENGINEER:

Barton & Loguidice, D.P.C.
Jeffrey J. Reed
NYS License No.: 083980
Valid Through: 05/31/2027



Barton & Loguidice, D.P.C.
Timothy W. Bolan
NYS License No.: 073477
Valid Through: 08/31/2028



END OF SECTION

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ONEIDA COUNTY DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

ORISKANY FUEL STORAGE DISPENSING FACILITIES

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+ + END OF SECTION + +

SECTION 01 10 00

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

- A. The following summary of Work is a general summary of the salient features of the Work to be performed by the General and Electrical construction contractors. It does not supersede the requirements of the detailed technical specifications.
 - 1. The Work shall include, but is not limited to:
 - a. Installation of a new diesel fuel fleet fueling station (Base Bid).
 - b. Demolition of existing fleet fueling station and installation of a new gasoline fleet fueling station (Alternate 01).

1.02 NUMBER OF CONTRACTS

- A. Work will be performed under two Prime Contracts. Each Contract is identified in the following and on the Drawings:
 - 1. Contract H2555801 – General Construction.
 - 2. Contract H2555802 – Electrical Construction.
- B. Refer to Section 01 29 00, Payment Procedures, for detailed Pay Item descriptions.

1.03 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Use of the site and buildings: Limit use of the premises to work in the areas shown.
- B. Use of the existing buildings: Repair damage caused by construction operations promptly.
- C. Contractor shall be responsible for providing and maintaining sanitary and personnel facilities for Contractor's employees, Subcontractors, and other onsite employers' employees. Service, clean, and maintain facilities and enclosures.

1.04 WORK SEQUENCE

- A. General
 - 1. Sequence Work in accordance with the requirements of the Contract Documents and the Progress Schedule, including allowable process outages and identified sequencing constraints.
 - 2. Sequence Work to minimize impacts to existing facilities.

- a. Alternate 01 be awarded, the diesel fueling station portion of the work shall be substantially complete prior to demolition of the existing fleet fueling system and installation of the gasoline fueling station.
3. Provide temporary facilities when required to maintain operation of existing facilities unless outages are specifically allowed by the Contract Documents.
4. Contractor may propose improvements to this Work sequence, however, Owner reserves the right to reject such proposals should it violate permit conditions, conflict with sequences of other contracts, adversely impact operation of existing or new facilities, or otherwise not be in the best interest of the Project.
5. Work shall be substantially complete as indicated in the Agreement and Section 01 31 13, Project Coordination.
6. Active facilities:
 - a. The Contractor is advised that the project site is an active Department of Public Works facility.
 - b. The Contractor shall coordinate its operation with Owner operations and shall not unnecessarily impede the Owner's use of the facility for the Contract duration.
 - c. The Contractor shall coordinate connection of new work to existing facilities with Owner.

1.05 CONTINUOUS OWNER OCCUPANCY

- A. The Owner will occupy the building and site during the construction period and will maintain normal operations. The Owner will cooperate with the Contractors to facilitate the continuity and progress of the Work. Cooperate with the Owner by minimizing the disturbance of the Owner's activities in spaces adjacent to the construction work.
- B. Protect the occupants and the general public against hazards of the construction operation and also provide access to Owner-occupied spaces. If elimination of access to any occupied space becomes necessary, it shall occur only after advance notice and special arrangements with the Owner.
- C. Provide necessary barricades, temporary partitions, other separations, and closures to protect the occupants of the building from harm or injury due to the construction operations, to restrict occupancy of construction areas to construction workers, and to prevent dust and debris caused by construction activities from entering Owner-occupied spaces.
- D. Maintain exitways at all times while the building is occupied.

1.06 PERMITS

- A. Owner will secure all building permits, coordinate all inspections, pay all fees, to authorities having jurisdiction, and secure certificates of occupancy for all facilities constructed under this Contract.

1.07 WORK INCLUDED IN ALL SEGMENTS OF THE WORK

- A. Any and all surveys, layouts, etc. required to accomplish the Work shall be provided by the Contractor.
- B. Contractor shall be responsible to provide drinking water for his own personnel.
- C. Contractor shall review the Drawings and Specifications as it may affect their work and/or trade jurisdiction and shall include in their Bid all costs necessary to make connections with or coordinate with those requirements whether expressly stated therein or implied.
- D. Unless otherwise indicated, demolition, removal and/or relocation of any existing items shown on the Drawings that conflict with the installation of the new work is the responsibility of the Contractor installing the new work.

1.08 ABBREVIATIONS AND SYMBOLS

- A. Contractors are expected to be familiar with the standard abbreviation symbols used in the Contract Documents. Inform the Engineer, in writing, of any unclear or unknown abbreviation or symbol prior to the Bid Date. Unless notified, the Engineer will assume that the Contractors are fully familiar with all such items and can execute their Work accordingly.

1.09 PROTECTION OF EXISTING BUILDINGS AND GROUNDS

- A. Provide protection to prevent damage to buildings, both interior and exterior, during construction operations. Contractors shall keep existing parking lot and public roadways free of mud and dirt and shall be cleaned as directed by Engineer and/or Owner.
- B. Provide protection of grounds at staging and dumpster locations.
- C. Contractor shall keep interior work areas free of dust and shall clean interior spaces if soiled.
- D. Contractor shall mitigate exterior dust generation regardless of location.
- E. Repair damage to buildings and grounds to satisfaction of the Owner during the course of the project.

- F. Contractor shall provide temporary toilet facilities and shall not utilize facilities within the building.

1.10 PROTECTION OF EQUIPMENT AND MATERIALS

- A. The Contractor shall assume full and complete responsibility for protection and safekeeping of his products and equipment stored at project location.

1.11 PROTECTION OF UTILITIES AND PAVING

- A. Provide and maintain adequate protection for existing utilities. Repair such Work damaged during construction to the satisfaction of the Engineer.

1.12 WORKERS CONDUCT

- A. No smoking, including electronic cigarettes and chewing tobacco, is allowed in buildings. No drinking of alcoholic beverages or use of controlled substances allowed on Owner's grounds. No reporting to work impaired by alcohol or controlled substances allowed.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

+ + END OF SECTION + +

SECTION 01 21 00

ALLOWANCES

PART 1 - GENERAL

1.01 SUMMARY

- A. Related work specified elsewhere:
 - 1. Section 01 29 00, Payment Procedures.
- B. Include in the Base Bid an Allowance as specified.
- C. The overhead and profit for the allowance shall be included in the Base Bid and are not part of the allowances.
- D. The allowance will be administered in accordance with the General Conditions of the Contract for Construction.
- E. The allowance shall be used only upon written authorization of the Engineer and/or Owner.
- F. Allowance monies not used shall be credited to the Owner in accordance with the General Conditions of the Contract for Construction.

1.02 ALLOWANCES

- A. General Construction Contingency Allowance – Contract No. H2555801:
 - 1. Include Ten Thousand Dollars (\$10,000.00) to cover the actual costs of Work resulting in unforeseen conditions discovered during the progress of the Work and for work beyond the scope of the Contract documents.
- B. Electrical Construction Contingency Allowance – Contract No. H2555802:
 - 1. Include Thirty Thousand Dollars (\$30,000.00) to cover the actual costs of Work resulting in unforeseen conditions discovered during the progress of the Work and for work beyond the scope of the Contract documents.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

+ + END OF SECTION + +

SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.01 SUMMARY

- A. Related work specified elsewhere:
 - 1. Section 01 23 00, Alternates;
 - 2. Section 01 29 00, Payment Procedures.
- B. Include in the Alternate 01 Bid the total price associated with the quantities indicated for each Unit Price.

1.02 MEASUREMENT AND PAYMENT

- A. Unit Quantities: Quantities and measurements indicated below are for Alternate 01. If adjustments are directed, actual quantities provided will determine payment.
- B. Measurement and payment are as detailed in Section 01 29 00, Payment Procedures.

1.03 UNIT PRICES

- A. Petroleum Contaminated Soils:
 - 1. Include 100 tons in the Alternate 01 Bid.
- B. Petroleum Contaminated Fluids:
 - 1. Include 1,500 gallons in the Alternate 01 Bid.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

+ + END OF SECTION + +

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes description of changes to Contract Amount and Contract Scope.
- B. Related work specified elsewhere:
 - 1. Section 01 22 00, Unit Prices;
 - 2. Section 01 29 00, Payment Procedures.

1.02 SUBMISSION REQUIREMENTS

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

1.03 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to complete and fully integrate that work into the 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 specifically mentioned as part of the Alternate.

1.04 ALTERNATES

- A. Alternate No. 01
 - 1. Each Bidder shall state the amount to be **added** to the Base Bid to provide all work associated with complete demolition of the existing fueling station and installation of a new gasoline fleet fueling station.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SUBMITTALS

- A. Informational Submittals:
 - 1. Schedule of Values.
 - 2. Application for Payment.
 - 3. Final Application for Payment.

1.02 SCHEDULE OF VALUES

- A. Prepare a separate Schedule of Values for each schedule of the Work under the Agreement.
- B. Upon request of Engineer, provide documentation to support the accuracy of the Schedule of Values.
- C. An unbalanced or front-loaded Schedule of Values will not be accepted.
- D. Summation of the complete Schedule of Values representing all the Work shall equal the Contract Price.
- E. Unit Price Work: Reflect unit price quantity and price breakdown from Contract Documents.
- F. Lump Sum Work:
 - 1. Reflect specified allowances and alternates, as applicable.
 - 2. List bonds and insurance premiums, mobilization, demobilization, Progress Schedule preparation and updates, equipment testing, testing electrical equipment and devices, and contract closeout separately.
 - 3. Each line item shall include a directly proportional amount of the Contractor's overhead and profit.
 - 4. Line items shall be subdivided into the Bid Items shown on the Bid Form and further subdivided by structure.
 - 5. Paving shall include all associated excavation, subbase, base, pavement, backfill and compaction.
 - 6. At a minimum, concrete shall be subdivided as follows:
 - a. Slab-on-Grade, 8-inches thick or less
 - b. Slab-on-Grade: Greater than 8-inches thick
 - c. Walls.
 - d. Columns.
 - e. Beams.
 - f. Suspended Slabs.

- g. Reinforced fill.
 - h. Unreinforced fill
 - i. Miscellaneous.
 - 7. Revise Schedule of Values to include executed Change Orders with each Application for Payment.
- G. Stored Materials Log
 - 1. The Contractor shall submit with each pay application a Stored Materials Log, listing all materials for which payment is requested but which have not yet been incorporated into the Work. The log shall include: description, quantity, value, storage location, and supporting invoices. Payment for stored materials is subject to verification by the Owner and Architect/Engineer. The County will provide an example upon request.
- H. Classification of Stored Materials
 - 1. Materials listed as 'stored materials' on the pay application shall remain classified as such until they are incorporated into the Work and accepted by the Architect/Engineer. Only upon installation and acceptance shall the value of such materials be transferred from the 'stored materials' column to the 'Completed Work' columns on subsequent pay applications. Delivery to the project site alone, does not qualify materials as "Work Completed".

1.03 APPLICATION FOR PAYMENT

- A. Include accepted Schedule of Values for each schedule or portion of lump sum Work and the unit price breakdown for the portions of Work to be paid on a unit price basis.
- B. Include separate line items for each Change Order and Work Change Directive executed prior to date of submission. Provide further breakdown of such, as requested by Engineer.

1.04 PAY ITEMS

- A. General Statement: The inclusion of references to Specification Section(s) in the Item Descriptions is for convenience only, and shall not be interpreted to mean that the referenced Section contains a complete description of all the Work necessary to complete the item.

BASE BID ITEMS – CONTRACT H2555801, GENERAL CONSTRUCTION

- B. Pay Item 1: GENERAL CONSTRUCTION
 - 1. Measurement: Lump Sum.
 - a. Payment:

- 1) Payment shall include all labor, equipment, material and incidental work necessary to install and commission one (1) new diesel fuel fleet fueling station portion of the work, including UST, associated piping, and structures including canopy, and site restoration at the Oneida County Oriskany Department of Public Works Facility as shown on the Drawings and as specified herein.
 - 2) Payment shall include all necessary sequencing of the Work with the Owner's operation.
 - 3) Payment shall also include all administration and superintendence for the project including but not limited to submittal preparation, coordination, maintenance of temporary erosion and sediment control practices, and other general requirements of the Contract.
- b. Related Work:
- 1) Drawings:
 - a) G001, G002, G003, C201, C202, C501 through C504.
 - 2) Specifications:
 - a) Divisions 01 through 23, Divisions 31 and 32.

ALTERNATE BID ITEMS – CONTRACT H2555801, GENERAL CONSTRUCTION

C. Pay Item 2: GENERAL CONSTRUCTION

- a. Measurement: Lump Sum.
 - 1) Payment shall be full compensation for all labor, equipment, and material to excavate, remove and dispose of existing fleet fueling station at the Oneida County Oriskany Department of Public Works Facility to the limits shown on the Drawings.
 - 2) Payment shall include all necessary sequencing of the Work with the Owner's operation.
 - 3) Payment shall also include all labor, equipment, material and incidental work necessary to install and commission one (1) new gasoline fleet fueling station, including USTs, associated piping, and structures including canopies, and site restoration as shown on the Drawings and as specified herein.
 - 4) Payment shall also include all administration and superintendence for the project including but not limited to submittal preparation, coordination, maintenance of temporary erosion and sediment control practices, and other general requirements of the Contract.
- b. Related Work:
 - 1) Drawings:

- a) G001, G002, G003, C100, C200, C202, C501 through C504.
- 2) Specifications:
 - a) Divisions 01 through 23, Divisions 31 and 32.

D. Pay Item 3: PETROLEUM CONTAMINATED SOILS

- 1. Measurement: Unit Price, Ton.
 - a. Payment: Payment shall be full compensation for each ton of petroleum contaminated soil excavated, removed, staged, characterized, loaded, transported, disposed of at Oneida-Herkimer Solid Waste Authority and backfilled with Granular Fill and compacted as specified herein. Excavation and backfill associated with all other portions of the Work shall be paid under Pay Item 2.
 - b. Related Work:
 - 1) Drawings:
 - a) C100
 - 2) Specifications:
 - a) 02 65 00.20

E. Pay Item 4: PETROLEUM CONTAMINATED FLUIDS

- a. Measurement: Unit price, Gallon (GAL).
- b. Payment:
 - 1) Payment shall be full compensation for each gallon of remaining fuel removed from the tanks and includes containerization, testing, loading, transport, and disposal of petroleum contaminated fluids. No separate payment will be made for residual tank fluids or sludges leaking into the excavation and shall be remediated at the Contractor's expense. Payment for all wash fluids and sludges generated requiring disposal during the removal and closure of the existing AST system shall be included in Pay Item 2.
- c. Related Work:
 - 1) Drawings:
 - a) C100
 - 2) Specifications:
 - a) 02 65 00.20

BASE BID ITEMS – CONTRACT H2555802, ELECTRICAL CONSTRUCTION

F. Pay Item 1: ELECTRICAL CONSTRUCTION

- 1. Measurement: Lump Sum
 - a. Payment:
 - 1) Payment shall be full compensation for all labor, equipment, and material to facilitate the electrical installation of one (1) new diesel fuel fleet fueling station at

- the Oneida County Oriskany Department of Public Works Facility to the limits shown on the Drawings.
- 2) Payment shall include all necessary sequencing of the Work with the Owner's operation.
- 3) Payment shall also include all administration and superintendence for the project including but not limited to submittal preparation, coordination, and other general requirements of the Contract.
- b. Related Work:
 - 1) Drawings:
 - a) G001, G002, G003, E001, E201, E502 through E504
 - 2) Specifications:
 - a) Divisions 01 and 26

ALTERNATE BID ITEMS – CONTRACT H2555802, ELECTRICAL CONSTRUCTION

G. Pay Item 2: ELECTRICAL CONSTRUCTION

- 1. Measurement: Lump Sum
 - a. Payment:
 - 1) Payment shall be full compensation for all labor, equipment, and material to facilitate the electrical demolition of the existing fleet fueling station and the electrical installation of one (1) new gasoline fleet fueling station at the Oneida County Oriskany Department of Public Works Facility to the limits shown on the Drawings.
 - 2) Payment shall include all necessary sequencing of the Work with the Owner's operation.
 - 3) Payment shall also include all administration and superintendence for the project including but not limited to submittal preparation, coordination, and other general requirements of the Contract.
 - b. Related Work:
 - 1) Drawings:
 - a) G001, G002, G003, E001, E100, E200, E501, E503, E504
 - 2) Specifications:
 - a) Divisions 01 and 26

1.05 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

- A. Payment will not be made for the following:
 - 1. Loading, hauling, and disposing of rejected material.
 - 2. Quantities of material wasted or disposed in a manner not called for in the Contract Documents.

3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provision of Contract Documents.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by Owner.
6. Material remaining on hand after completion of the Work.

1.06 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

- A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless Shop Drawings have been approved and preliminary operation and maintenance data has been accepted by Engineer.
- B. Final Payment:
 1. Will be made only for products incorporated into the Work.
 2. Remaining products, for which partial payments have been made shall revert to Contractor unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

1.07 PARTIAL PAYMENT FOR UNDELIVERED, PROJECT-SPECIFIC MANUFACTURED OR FABRICATED EQUIPMENT

- A. Notwithstanding the aforementioned provisions, partial payments for undelivered (not yet delivered to site or not stored in the vicinity of the site) products specifically manufactured for this Project, excluding off-the-shelf or catalog items, will be made for products listed below when all following conditions exist:
 1. Partial payment request is supported by written acknowledgement from Suppliers that invoice requirements have been met.
 2. Equipment is adequately insured, maintained, stored, and protected by appropriate security measures.
 3. Each equipment items is clearly marked and segregated from other items to permit inventory and accountability.
 4. Authorization has been provided for access to storage site for Engineer and Owner.
 5. Equipment meets applicable Specifications of these Contract Documents.
- B. Failure of Contractor to continue compliance with above requirements shall give cause for Owner to withhold payments made for such equipment from future partial payments.

1.08 DEPOSIT PAYMENT AND REIMBURSEMENT

- A. Authorization and Eligibility
 1. Deposit payments or reimbursements will only be considered for materials or equipment pre-authorized in writing by the Owner, and only for specialty or long-lead items that are critical to the project schedule.

B. Documentation Required

1. The Contractor must submit a written request for deposit reimbursement, including:
 - a. A copy of the executed purchase order or contract with the supplier,
 - b. Proof of the deposit amount and payment terms,
 - c. Evidence that the deposit is non-refundable and required to secure the order,
 - d. Proof of insurance covering the deposit amount (see insurance requirements),
 - e. Assignment of rights to the Owner for the material/equipment in the event of contractor default.

C. Schedule of Values and Pay Application

1. Any approved deposit reimbursement must be listed as a separate line item in the Schedule of Values.
2. The deposit amount shall not be moved to “Stored Materials” or “Work Completed” until the material is delivered to the site (or approved offsite storage) and verified by the Owner.
3. Upon delivery and verification, the value of the deposit (and any additional payments) shall be moved to the “Stored Materials” column.
4. Only after installation and acceptance shall the value be transferred to the “Work Completed” column.

D. Risk Mitigation

1. The Contractor shall ensure that the Owner is named as an additional insured and loss payee on any insurance covering the deposit and the material.
2. The Contractor shall assign all rights and title to the material/equipment to the Owner upon payment of the deposit reimbursement.

E. Offsite Storage (if applicable)

1. If materials are stored offsite, the storage location must be pre-approved by the Owner, and the Contractor must provide proof of secure, segregated storage and insurance and be included in the Stored Materials Log.

F. Installation Floater

1. The Contractor shall provide and maintain an Installation Floater insurance policy covering all materials, equipment, machinery, and supplies to be used in the construction of the project. Coverage shall be on an ‘all-risk’ basis, including transit, storage, and installation, for the full contract value. The Owner shall be named as an additional insured and loss payee.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 31 13

PROJECT COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

- A. The Owner's operations staff will maintain control over the facility for the duration of the Contract.
- B. All outages, cut-overs and connections of new Work shall be coordinated with the respective Oneida County DPW personnel.

1.02 RELATED WORK AT THE SITE

- A. General:
 - 1. Other work that is either directly or indirectly related to schedule performance of the Work under these Contract Documents, listed henceforth, is anticipated to be performed at the site by others.
 - 2. Coordinate the Work of the Contract Documents with work of others as specified in the General Conditions of the Contract for Construction.
 - 3. Include sequencing constraints specified herein as a part of Progress Schedule.

1.03 FACILITY OPERATIONS

- A. Continuous operation of Owner's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.
- B. Perform Work continuously during critical connections and change-overs, and as required to prevent interruption of the Owner's operation.
- C. When necessary, plan, design, and provide various temporary services, utilities, connections, temporary piping and heating, access, and similar items to maintain continuous operations of the Owner's facilities.

1.04 SUBSTANTIAL COMPLETION

- A. Completion of the following items shall constitute Substantial Completion for the following portion of Work and the entire Work:
 - 1. Portion of Work that constitutes Substantial Completion of the diesel fueling station:
 - a. Installation and successful commissioning of the new diesel fueling station including restoration of the work area.

- b. Successful completion of this work shall constitute Substantial Completion of the work and shall set the date of warranty period commencement for all labor, equipment, and material furnished by the Contractor.
- 2. Entire Work that constitutes Substantial Completion of the remaining Work (if Alternate 01 is Awarded):
 - a. Demolition of existing fleet fueling station at DPW facility.
 - b. Removal and lawful disposal of all wastes generated as a result of performing the work.
 - c. Restoration of the site as specified herein.
 - d. Successful completion of this work shall constitute Substantial Completion of the work and shall set the date of warranty period commencement for all labor, equipment, and material furnished by the Contractor.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Engineer will schedule physical arrangements for meetings throughout the progress of the Work on an as-needed basis, prepare meeting agenda with regular participant input and will distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes following each meeting to participants and parties affected.

1.02 PRECONSTRUCTION CONFERENCE

- A. Contractor shall be prepared to discuss the following subjects, as a minimum:
 - 1. Required schedules.
 - 2. Status of bonds and insurance.
 - 3. Sequencing of critical path work items.
 - 4. Progress payment procedures.
 - 5. Project changes and clarifications.
 - 6. Use of Site, access, office and storage areas, security and temporary facilities.
 - 7. Major product delivery and priorities.
 - 8. Contractor's safety plan.
- B. Attendees will include:
 - 1. Owner's representative.
 - 2. Contractor's office representative.
 - 3. Contractor's resident superintendent/project manager
 - 4. Contractor's quality control/safety representative.
 - 5. Subcontractors' representatives whom the Contractor may wish or Engineer may request to attend.
 - 6. Engineer's representatives.
 - 7. Others, as appropriate.

1.03 PROGRESS MEETINGS

- A. Engineer will schedule as-needed progress meetings at site, conducted as-needed to review the Work progress, Progress Schedule, Schedule of Submittals, Application for Payment, contract modifications, and other matters needing discussion and resolution. Additional coordination meetings may be called by Owner, as required to adequately coordinate major tie-ins.
- B. Attendees will include:
 - 1. Owner's representative(s), as appropriate.
 - 2. Contractor, Subcontractors, and Suppliers, as appropriate.
 - 3. Engineer's representative(s).
 - 4. Others, as appropriate.

1.04 PRE-INSTALLATION MEETINGS

- A. When required in individual Specification sections, convene at site prior to commencing the Work of that Section.
- B. Require attendance of entities directly affecting, or affected by the Work of that Section.
- C. Notify the Engineer 7 days in advance of the meeting date.
- D. Provide suggested agenda to Engineer to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

1.05 OTHER MEETINGS

- A. In accordance with Contract Documents and as may be required by Owner and Engineer.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Informational Submittals:
 - 1. Preliminary Progress Schedule.
 - 2. Detailed Progress Schedule:
 - a. Submit an Updated Progress Schedule at each update, as specified herein.
 - 3. Submit with each Progress Schedule submittal:
 - a. Contractor's certification that Progress Schedule submittal is actual schedule being utilized for execution of the Work.
 - b. Project shall be scheduled using P6 by Primavera, or approved equal software capable of critical path activity analysis.
 - c. Progress schedule: One (1) legible copy.

1.02 SCHEDULE COORDINATION

- A. Where Contractor is referred to in the singular, it shall refer to each of separate contractors as applicable.
- B. General Contractor shall incorporate detailed schedules prepared by other contractors into the overall Progress Schedule, and shall maintain throughout the duration of the Project.
- C. Coordinate preparation and process of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- D. Coordinate Contractor's construction schedule with the schedule of values, list of subcontractors, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

- E. Schedule Updates:
 - 1. The General Contractor shall update the work schedule on a monthly basis throughout construction.

1.03 PROGRESS OF THE WORK

- A. Updated Progress Schedule shall reflect:
 - 1. Progress of Work through each month.
 - 2. Approved changes in Work scope and activities modified since submittal.
 - 3. Delays in Submittals or resubmittals, deliveries, or Work.
 - 4. Adjusted or modified sequences of the Work.
 - 5. Other identifiable changes.
 - 6. Revised projections of progress and completion.
 - 7. Report of changed logic.
- B. Produce detailed sub-schedules during Project, upon request of Owner or Engineer, to further define critical portions of the Work, such as a planned facility shutdown.
- C. If Contractor fails to complete activity by its latest scheduled completion date and this failure impacts the critical path, the Contractor shall, within 7 days of such failure, submit a recovery schedule, detailing how the Contractor intends to correct nonperformance and return to acceptable current Progress Schedule. Actions by the Contractor to complete the Work within Contract Times (or Milestones) will not be justification for adjustment to Contract Price or Contract Times.
- D. Owner may order Contractor to increase plant, equipment, labor force or working hours if Contractor fails to:
 - 1. Complete a portion of Work by its completion date.
 - 2. Satisfactorily execute Work as necessary to prevent delay to overall completion of Project, at no additional cost to the Owner.

1.04 SCHEDULE ACCEPTANCE

- A. Engineer's acceptance will demonstrate agreement that:
 - 1. Proposed schedule is accepted with respect to:
 - a. Contract Times, including Final Completion and all intermediate portion(s) of Work are within the specified times.
 - b. Specified Work sequences and constraints are shown as specified.
 - c. Access restrictions are accurately reflected.
 - d. Startup and testing times are as specified.
 - e. Submittal review times are as specified.
 - f. Startup testing duration is as specified and timing is acceptable.
 - 2. In all other respects, Engineer's acceptance of the Contractor's schedule indicates that, in the Engineer's judgement, schedule represents a reasonable plan for constructing the project in accordance with the

Contract Documents. The Engineer's review will not make any change in Contract requirements. Lack of comment on any aspect of the schedule that is not in accordance with the Contract Documents will not thereby indicate acceptance of the change, unless Contractor has explicitly called the non-conformance to the Engineer's attention in submittal. Schedule remains the Contractor's responsibility and the Contractor retains responsibility for performing all activities, for activity durations, and for activity sequences required to construct the Project in accordance with the Contract Documents.

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes requirements for the Schedule of Submittals and administrative and procedural requirements for submitting Shop Drawings Samples, and other submittals.

1.02 DEFINITIONS

- A. Action Submittals:
 - 1. Written and graphic information and physical samples that require Engineer's responsive action.
 - 2. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals:
 - 1. Written and graphic information and physical Samples that do not require Engineer's responsive action.
 - 2. Submittals may be rejected for not complying with requirements.
 - 3. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals".
- C. Portable Document Format (PDF): An open file format standard licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.03 FORMAT

- A. Contractor shall be responsible for submittal all information necessary for submittal approvals. Submittals shall be submitted electronically to the Engineer. Any parties to receive submittals shall be established at the Preconstruction Meeting.
- B. A letter of transmittal shall accompany each submittal. If data for more than one section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each section.
- C. If a Shop Drawing deviates from the requirements of the Contract Documents, Contractor shall specifically note each deviation in its letter of transmittal.
- D. When Samples are required, the quantities are identified in the individual Specification sections.

- E. Contractor's approval:
1. All submittals shall bear the stamp of approval and signature of Contractor as evidence that the submittal has been reviewed by Contractor.
 2. Submittals without this stamp of approval will not be reviewed and will be returned to Contractor.
 3. Contractor's stamp shall contain the following minimum information:
 - a. Project: Oneida County DPW Oriskany Fuel Storage Dispensing Facilities
 - b. Contractor:
 - c. Date:
 - d. Specification section:
 - e. Drawing number(s):
 - f. Submittal No.: SS SS SS-sss-rrr, where:
 - 1) SS SS SS: Specification section number.
 - 2) sss: sequential submittal number.
 - 3) rrr: submittal revision number. All initial submittals shall be revision number "000".
- F. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification section.
 2. Submit electronically in PDF format.
 3. Paper Submittals: No paper submittals will be accepted as part of this Project unless specifically required as part of the Contract Documents or requested by Engineer or Engineer's consultants.
- G. Resubmittals:
1. Make resubmittals in same form and number of copies as initial submittal.
 2. Resubmittals shall be as a standalone submittal, including all applicable information from the previous submittals.
 3. Resubmittals that only include information on revised items will be returned without review.
 4. Note date and content of previous submittal.
 5. Note date and content of revision in label or title block and clearly indicate extent of revision.
 6. Contractor must clearly draw attention to additional revisions made that were not requested in previous submittal review comments.
 7. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.

1.04 SCHEDULE OF SUBMITTALS

- A. Submit a preliminary Schedule of Submittals in accordance with the Contract Documents.
- B. Revise and resubmit until acceptable to Engineer.

1.05 OR-EQUALS AND SUBSTITUTIONS

- A. Requests for substitutions or consideration of “or equal” items shall be handled as specified in the Contract Documents.
- B. Substitutions or “or equal” items shown or implied on the submittal are prohibited and will be rejected.

1.06 DELEGATED DESIGN SERVICES

- A. Performance and design criteria:
 - 1. 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.
 - 2. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
- B. Delegated-design services certification:
 - 1. In addition to Shop Drawings, and other submittals, submit digitally signed PDF electronic file copies of certificate, 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.
 - 2. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.01 CONTRACTOR’S RESPONSIBILITIES

- A. General:
 - 1. Contractor shall forward submittals well in advance of the need for the material or equipment for construction and with required allowance for time required to make delivery of material or equipment after data covering such is approved.
 - 2. Contractor assumes the risk for all material or equipment that is ordered, fabricated, or shipped prior to the approval of submittals.
 - 3. No material or equipment will be permitted to be incorporated into the Work nor will such be included in Applications for Payment until approval thereof has been obtained in the manner specified herein.

B. Coordination:

1. It is Contractor's responsibility to review submittals of its Suppliers and Subcontractors before transmitting them to Engineer to assure proper coordination of the Work, to determine that each submittal is in accordance with the Contract Documents, and that there is sufficient information about material and equipment for Engineer to determine compliance with the Contract Documents.
2. Incomplete or inadequate submittals will be returned for revision without review, as specified herein.
3. Approval of submittals shall not relieve Contractor from the obligation of furnishing material and equipment of proper dimension, size, quality, quantity, and all performance characteristics to perform the requirements and intent of the Contract Documents
4. Engineer's approval shall not relieve Contractor from responsibility for errors of any sort on the submittals.
5. Approval is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents.
6. Contractor is responsible for dimensions which shall be confirmed and correlated at the Site.
7. Contractor is responsible for information that pertains solely to the fabrication processes or to the technique of construction and for the coordination of the Work of all trades.

C. Engineer's approval:

1. Submittals not bearing the Engineer's "approved" or "approved as noted" notation shall not be used, issued to Subcontractors, nor utilized for construction purposes.
2. No work shall be performed or equipment installed without an approved Shop Drawing or submittal.
3. Contractor assumes the risk for all work performed or equipment installed without an approved Shop Drawing or submittal.
4. In the event Contractor obtains Engineer's approval for the use of equipment other than that which is shown or specified, Contractor shall, at its own expense and using methods approved by Engineer, make all changes to the Work, including structures, piping, electrical, equipment and controls, that may be necessary to accommodate this equipment.

3.02 ENGINEER'S ACTION

- A. Engineer will review and process all submittals promptly, but a reasonable time shall be allowed for submittal transmittals, reviews, and revisions.
- B. Contractor shall allow fifteen (15) days for each submittal review and response in the preparation of Progress Schedule unless otherwise specified in the Contract Documents.

- C. In preparing its Construction Progress Schedule, Contractor shall allow for two (2) submittal review cycles for each submittal.
- D. Owner may back-charge Contractor for costs associated with reviewing the third and successive submittal(s).
- E. Engineer will document and notify Owner in writing of all such back charges to be deducted Applications for Payment.

3.03 SUBMITTAL STATUS AND PROCEDURE

- A. After Engineer completes its review, the submittal will be marked with one of the following dispositions:
 - 1. Approved.
 - 2. Approved as noted.
 - 3. No action required.
 - 4. Revise as noted - Resubmit.
 - 5. Rejected – Resubmit as specified.
- B. Submittals marked “Approved”:
 - 1. Submittals that conform to the Contract Documents without comment will be issued a disposition of “Approved”.
 - 2. Contractor may order, fabricate, or ship the materials included in the submittal.
- C. Submittals marked “Approved as noted”:
 - 1. Submittals that conform to the Contract Documents with correction of minor clarifications or omissions will be issued a disposition of “Approved as noted”.
 - 2. Contractor may order, fabricate, or ship the materials included in the submittal that incorporates Engineer’s comments.
- D. Submittals marked “No action required”: Informational submittals will be issued a disposition of “No action required”, acknowledging to Contractor Engineer’s receipt of the submittal.
- E. Submittals marked “Revise as noted - Resubmit”:
 - 1. Submittals that include a named manufacturer or supplier, but contain insufficient information to determine conformance to the Contract Documents will be issued a disposition of “Revise and Resubmit”.
 - 2. Contractor shall make corrections to satisfy the deficiencies indicated and repeat the submittal procedure.
 - 3. The resubmittal shall conform to the submittal numbering procedure specified herein.

- F. Submittals marked “Rejected – Resubmit as specified”:
 - 1. Submittals that do not conform to the Contract Documents will be issued a disposition of “Rejected – Resubmit as specified”.
- G. Contractor shall revise the submittal to incorporate equipment or products that comply with the requirements of the Contract Documents.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 REFERENCES

- A. The following is a list of standards which may be referenced in this section
 1. American Nursery and Landscape Association (ANLA): American Standards for Nursery Stock.
 2. Federal Emergency Management Agency (FEMA).
 3. National Fire Prevention Association (NFPA): 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
 4. Telecommunications Industry Association (TIA): 568-C, Commercial Building Telecommunications Cabling Standard.
 5. U.S. Department of Agriculture (USDA): Urban Hydrology for Small Watersheds.
 6. U.S. Weather Bureau: Rainfall-Frequency Atlas of the U.S. for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 years.

1.02 SUBMITTALS

- A. Informational Submittals:
 1. Copies of permits and approvals for construction as required by Laws and Regulations and governing agencies.
 2. Temporary Utility submittals:
 - a. Electric power supply and distribution plans.
 3. Site Utilization Plan:
 - a. Parking area plans.
 - b. Contractor's field office, storage yard, and storage building plans, including gravel surfaced areas, if applicable.
 - c. Fencing and protective barrier locations and details.
 - d. Staging area location plan.
 - e. Plan for maintenance of existing operations.
 4. Temporary Control Submittals:
 - a. Dust control plan.
 - b. Plan for disposal of waste materials and intended haul routes.
 5. Project Sign and Construction Traffic Signs:
 - a. Submit layouts for approval prior to fabrication and delivery.
 - b. Design all signs and supports to withstand 75 mph wind load.

1.03 MOBILIZATION

- A. Mobilization shall include, but not be limited to, these principle items:
 1. Obtaining required permits.
 2. Moving Contractor's field office and equipment required for first month.

3. Installing temporary construction power, wiring and lighting facilities.
 4. Providing onsite communication facilities, including telephones.
 5. Providing onsite sanitary facilities and potable water facilities as specified and as required by Laws and Regulations.
 6. Arrange for and erection of, Contractor's work and storage yard.
 7. Posting OSHA required notices and establishing safety programs and procedures.
 8. Having Contractor's superintendent at the site full-time.
- B. Use area designated for Contractor's temporary facilities as shown on the Drawings or as directed by the Owner.

1.04 PROTECTION OF WORK AND PROPERTY

- A. Comply with Owner's safety rules while on Owner's property.
- B. Keep Owner informed of series onsite accidents and related claims.
- C. Use of explosives: No blasting or use of explosives will be allowed onsite.

1.05 VEHICULAR TRAFFIC

- A. Traffic Control Plan:
1. Adhere to traffic control plan reviewed and accepted by Engineer.
 2. Changes to this plan shall be made only by written approval of appropriate public authority.
 3. Secure approvals for necessary changes so as not to delay progress of the Work.
- B. Traffic Routing Plan: Show sequences of construction affecting use of roadways, time required for each phase of the Work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and striping to provide passages for pedestrians and vehicles.

PART 2 - PRODUCTS

[NOT USED]

PART 3 - EXECUTION

3.01 TEMPORARY UTILITIES

- A. Power:
1. No electric power is available at the Site. Make arrangements to obtain and pay for electrical power used until final payment and acceptance by

- the Owner, unless otherwise recommended by the Engineer at Substantial Completion.
2. Cost of electric power shall be borne by the Contractor. No separate payment will be made.
- B. Lighting: provide temporary lighting to meet applicable safety requirements to allow erection, application, or installation of materials and equipment, and observation or inspection of the Work.
- C. Heating, Cooling, and Ventilating:
1. Provide as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for installation of materials, and to protect materials, equipment, and finishes from damage because of temperature or humidity. Costs for temporary heat shall be borne by the Contractor.
 2. Pay costs of installation, maintenance, operation, removal, and fuel consumed.
- D. Water: No construction or potable water is available at the site. Make arrangements for and bear the cost of providing water required for construction purposes and drinking by construction personnel during construction.
- E. Sanitary and Personnel Facilities: Provide and maintain facilities for Contractor's employees, Subcontractors, and other onsite employers' employees. Service, clean and maintain facilities and enclosures.
- F. Fire Protection: Furnish and maintain on Site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of NFPA 241.

3.02 PROTECTION OF WORK AND PROPERTY

- A. General:
1. Perform Work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.
 2. Maintain in continuous service existing oil and gas pipelines, underground power, telephone and communication cable, water mains, irrigation lines, sewers, poles and overhead power and other utilities encountered along the line of the Work, unless other arrangements satisfactory to the utility owners of have been made.
 3. When completion of the Work requires temporary or permanent removal or relocation of existing utility, coordinate activities with utility owner and perform work to their satisfaction.
 4. Protect, shore, brace, support, and maintain underground utility construction uncovered or otherwise affected by construction operations.

5. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
 6. In areas where Contractor's operations are adjacent to or near a utility such as gas, telephone, television, electric power, water, sewer, or irrigation system, and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by the Contractor.
 7. Notify property owners and utility offices that may be affected by construction operation at least 2 days in advance. Before exposing a utility, obtain utility owner's permission. Should service of utility be interrupted due to Contractor's activity, notify proper authority immediately. Cooperate with said authority in restoring service as promptly as possible and bear costs incurred.
 8. Maintain original site drainage wherever possible.
- B. Site Security:
1. Provide and maintain temporary security fences as necessary to protect the Work and Contractor-furnished products not yet installed.
- C. Barricades and Lights:
1. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alley ways, inside and outside of fenced area, and as required to ensure public safety and the safety of the Contractor's employees, other employers' employees, and others who may be affected by the Work.
 2. Provide to protect existing facilities and adjacent properties from potential damage.
 3. Locate to enable access by facility operators and property owners.
 4. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.
 5. Locate barricades at the nearest intersecting public thoroughfare on each side of the blocked section.
 6. Illuminate barricades and obstructions with warning lights from sunset to sunrise.
- D. Waterways: Keep ditches, culverts, and natural drainages continuously free of construction materials and debris.

- E. Dewatering:
1. Construct, maintain, and operate cofferdams, channels, flume drains, sumps, pumps, or other temporary diversion and protection works.
 2. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the Work. Maintain foundations and parts of the Work free from water.
- F. Archeological Finds:
1. General: should finds of an archaeological or paleontological nature be made within the Contract limits, immediately notify the Owner and Engineer and proceed in accordance with the Contract Documents.
 2. Archaeological Finds: Evidence of human occupation or use of an area within Contract limits. Evidence may consist of skeletons, stone, or other utensils, or evidence of habitations or structures.
 3. Paleontological Finds: Evidence of prehistoric plant or animal life, such as skeletons, bones, fossils, or casts and other indications of such as pictographs.
 4. Owner may order the Work stopped in other areas if, in the Owner's opinion, find is more extensive than may appear from uncovered material.
 5. Protection of Finds:
 - a. Cover, fence, or otherwise protect finds until notice to resume the Work is given.
 - b. Cover finds with plastic film held in place by earth, rocks, or other weights placed outside the find. Should additional backfilling be necessary for safety or to prevent caving, place backfill material loosely over plastic film.
 - c. Sheet or shore as necessary to protect excavations underway. Place temporary fence to prevent unauthorized access.
 - d. Dewater finds made below water table as necessary to protect construction Work underway. Divert groundwater or surface runoff away from find by ditching or other acceptable means.
 6. Removal of Finds:
 - a. Finds are property of the Owner. Do not remove or disturb finds without Owner's written authorization.
 - b. Should Owner elect to have a find removed, provide equipment, labor, and material to permit safe removal of find without damage. Provide transportation for delivery to individuals, institutions, or other places as Owner may find desirable, expedient, or required by law.
- G. Threatened and Endangered Species:
1. Take precautions necessary and prudent to protect native endangered and threatened flora and fauna.
 2. Notify the Engineer of construction activities that may threaten threatened and endangered species or their habitats.

3. Engineer will mark areas known as habitats of threatened and endangered species prior to commencement of the Work, as applicable.
4. Additional areas will be marked by Engineer as other habitats of threatened and endangered species become known during construction.

3.03 TEMPORARY CONTROLS

A. Air Pollution Control:

1. Minimize air pollution from construction operations.
2. Burning of waste materials, rubbish, or other debris will not be allowed onsite.
3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust. Give unpaved streets, roads, detour, or haul roads used in construction area a dust-preventative treatment or periodically water to prevent dust. Strictly adhere to applicable environmental regulations for dust prevention.

B. Noise control:

1. Provide acoustical barriers so noise emanating from tools or equipment will not exceed legal noise levels.
2. Noise Control Plan: Propose plan to mitigate construction noise and comply with noise control ordinances, including method of construction, equipment to be used, and acoustical treatments.

C. Water Pollution Control:

1. Divert sanitary sewage and non-storm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.
2. Prior to commencing excavation and construction, obtain Owner's agreement with detailed plans showing procedures intended to manage and dispose of sewage, groundwater, and dewatering pump discharges.
3. Comply with Section 01 57 13, Temporary Erosion and Sediment Control, for storm water flow and surface runoff.
4. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of wastes into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris, and rubbish.

D. Erosion, Sediment, and Flood Control: Provide, maintain, and operate temporary facilities as specified in Section 01 57 13, Temporary Erosion and Sediment Control, to control erosion and sediment releases, and to protect the Work and existing facilities from flooding during construction period.

- E. Project Signage:
 - 1. Location of signs shall be as shown or as directed by the Engineer.
 - 2. Maintain signs so they are clean, legible, and upright. Keep grass and weeds cut away from signs.
 - 3. Repair and repaint damaged signs. Relocate signs as required by progress of Work.
 - 4. Remove signs when Project is completed or when directed by the Engineer.
 - 5. Signs to be relocated shall be removed, cleaned, and stored if not immediately reinstalled.

3.04 STORAGE YARDS AND BUILDINGS

- A. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.
- B. Temporary Storage Buildings:
 - 1. Provide environmental control systems that meet recommendations of manufacturers of equipment and material stored.
 - 2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
 - 3. Store combustible materials (paints, solvents, fuels) in well-ventilated and remote building meeting safety standards.

3.05 PARKING AREAS

- A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, Owner's operations, or construction operations.
- B. Provide parking facilities for personnel working on the Project. No employee or equipment parking will be permitted on Owner's existing paved areas, except as specifically designated for Contractor's use.
- C. Use area designated on Drawings or area as designated by the Owner for parking of Contractor's and Contractor's employees' vehicles.

3.06 VEHICULAR TRAFFIC

- A. Ensure the least possible obstruction to traffic and normal commercial pursuits.
- B. Conduct the work to interfere as little as possible with public travel, whether vehicular or pedestrian.
- C. Maintain top of backfilled excavations before they are paved, to allow normal vehicular traffic to pass over. Cleanup operations shall follow immediately behind backfilling.

- D. Provide snow removal to facilitate normal vehicular traffic on public parking areas affected by construction. Perform snow removal promptly and efficiently by means of suitable equipment whenever necessary for safety, and as may be directed by proper authority.

3.07 CLEANING DURING CONSTRUCTION

- A. In accordance with the General Conditions, as may be specified in other specification sections, and as required herein.
- B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris. At least weekly, sweep floors (basins, tunnels, platforms, walkways, roof surfaces), and pick up and dispose of debris.
- C. Provide approved containers for collection and disposal of waste materials, debris, and rubbish off-site.
- D. At least weekly, brush sweep entry drive, roadways and other streets and walkways affected by the Work and where adjacent to the Work.

END OF SECTION

SECTION 01 57 13

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. Scope:
 - 1. This section covers work necessary for stabilization of soil to prevent erosion during and after construction and land-disturbing activities.
 - 2. The Work shall include the furnishing of all labor, material, tools, and equipment to perform the Work and services necessary as herein specified and as indicated on the Drawings.
 - 3. This shall include installation, maintenance, and final removal of all temporary soil erosion and sediment control measures.
- B. The Contractor is solely responsible for the control of soil erosion and sediment transport from all areas of disturbance. Failure of the Owner, Engineer, or other Authority having jurisdiction to identify locations or types of erosion control practices shall not alleviate the Contractor's responsibility to prevent soil erosion and sediment transport at all times.
- C. The minimum areas requiring soil erosion and sediment control measures are indicated on the Drawings.
- D. The Owner or Engineer reserves the right to modify the use, location, and quantities of soil erosion and sediment control, based on the Contractor's activities.
- E. See additional information noted on the Drawings.

1.02 GENERAL

- A. All activities shall conform to the latest edition of the New York State Storm Water Management Design Manual, the SPDES General Permit GP-0-25-001, and the Drawings. In the event of conflicting requirements, the more stringent requirements shall apply.
- B. Soil erosion stabilization and sedimentation control consist of the following elements:
 - 1. Maintenance of existing permanent or temporary storm drainage piping and channel systems, as necessary.
 - 2. Construction of new permanent and temporary storm drainage piping and channel systems, as necessary.
 - 3. Construction of temporary erosion control facilities such as silt fences, check dams, etc.

4. Topsoil and seeding:
 - a. Placement and maintenance of Temporary Seeding on all areas disturbed by construction.
 - b. Placement of permanent topsoil, fertilizer, and seed, etc. in all areas not occupied by structures or pavement, unless shown otherwise.
 5. Soil Stabilization Seeding: Placement of fertilizer, seed, etc. in areas as specified hereinafter.
- C. The Contractor shall be responsible for phasing and coordinating Work in areas allocated for respective use including proposed stockpile areas to restrict sediment transport. This will include installation of all temporary erosion and sediment control devices, ditches, or other facilities.
- D. 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 its 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 control all sediment transport away from the area.
- E. Sediment transport and erosion from working stockpiles shall be controlled and restricted from moving beyond the immediate stockpile area by installation of silt fence or fiber rolls and construction of temporary toe-of-slope ditches, as necessary. The Contractor shall keep these temporary facilities in operational condition by regular cleaning, regrading, and maintenance. Stockpiles remaining in place longer than 14 calendar days shall be considered permanent stockpiles for purposes of erosion and sediment control.
- F. All permanent stockpiles shall be seeded with soil stabilization seed and protected by permanent 2-foot-minimum ditches, completely surrounding stockpiles and located within 10 feet of the toes of stockpile slopes.
- G. The Contractor shall maintain all elements of the soil erosion and sediment control systems and facilities to be constructed during this Project for the duration of activity on the Project. Formal inspections made jointly by the Contractor and the Engineer shall be conducted every 2 weeks to evaluate the Contractor's conformance. These inspections shall be in addition to the daily inspections performed by the Contractor and the weekly inspections performed by the Engineer.
- H. All silt traps shall be cleaned of collected sediment after every storm or as determined from weekly inspections. Cleaning shall be done in a manner that will not direct the sediment into the storm drain piping system. Removed sediment shall be taken to an area selected by the Engineer where it can be

cleaned of sticks and debris, then allowed to dry. Final sediment and debris disposal shall be on-site, as directed by the Engineer.

- 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 2 days after receiving written notice from the Engineer.
- J. Unpaved earth drainage ditches shall be re-graded as needed to maintain original grade and remove sediment buildup. If a ditch becomes difficult to maintain, the Contractor shall cooperate with the Engineer and install additional erosion control devices such as check dams, rolled erosion control product, or silt fences, as directed by the Engineer.
- K. 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, the Owner shall have sufficient cause to engage others to perform any needed maintenance or cleanup, including removal of accumulated sediment at constructed erosion control facilities.

1.03 SUBMITTALS

- A. Comply with Section 01 33 00, Submittal Procedures.
- B. In addition, the Contractor shall provide the following specific information:
 - 1. Certificates of inspection of seed by State or Federal authorities and copies of delivery invoices or other proof of quantities of fertilizer.
 - 2. Manufacturer's certificate of compliance attesting that the geotextile meets the requirements of these Specifications.

PART 2 - PRODUCTS

2.01 PERMANENT SEED

- A. Seed shall be as specified under Section 32 92 19, Seeding.

2.02 SOIL STABILIZATION AND TEMPORARY SEED

- A. Summer seed mix shall be Annual or Perennial Ryegrass.
- B. Winter seed mix shall be Certified Aroostook Winter Rye (cereal rye).

2.03 TOPSOIL

- A. Topsoil shall be as specified under Section 32 91 19.13, Topsoil Placement and Grading.

2.04 FERTILIZER

- A. Fertilizer shall be commercial, chemical type, uniform in composition, free-flowing, conforming to State and Federal laws, and suitable for application with equipment designed for that purpose.
- B. State law prohibits the application of fertilizer between December 1 and April 1, and application within 20 feet of a surface water is restricted.
- C. Fertilizers shall have a minimum percentage of plant food by weight for the following: Permanent fertilizer mix shall be 10 percent nitrogen, 10 percent phosphoric acid, and 10 percent potash.
- D. Fertilizer with phosphate composition greater than 0.67 percent by weight may only be used if new lawn is being established or a soil test indicates that it is necessary. Projects located within watersheds with Enhanced Phosphorus Removal Standards may only use fertilizer with more than 0.67 phosphate with a valid soil test demonstrating need.

2.05 LIME

- A. Ground dolomitic limestone not less than 85 percent total carbonates and magnesium, ground so that 50 percent passes through a 100-mesh sieve and 90 percent passes a 20-mesh sieve. Coarser material will be acceptable provided the specified application rates are increased proportionately on the basis of quantities passing a 100-sieve.
- B. Quantity of lime needed varies by soil pH. Apply in accordance with current edition of the New York State Standards and Specifications for Erosion and Sediment Control.

2.06 STRAW MULCH

- A. Threshed straw of oats, wheat, barley, or rye, free from seed of noxious weeds, or clean salt hay applied at 2 tons per acre.

2.07 EROSION CONTROL BLANKETS

- A. The erosion control blanket shall be a machine-produced mat of 70% agricultural straw and 30% coconut fiber matrix.
- B. The blanket shall be of consistent thickness with the straw and coconut fiber evenly distributed over the entire area of the mat.
- C. The blanket shall be covered on the top side with heavyweight photodegradable netting having ultraviolet additives to delay breakdown and an approximately 0.63-inch x 0.63-inch mesh.

TEMPORARY EROSION AND SEDIMENT CONTROL

- D. The bottom side shall be covered with a lightweight photodegradable polypropylene netting having an approximate 1/2-inch x 1/2-inch mesh. The blanket shall be sewn together on 1.5-inch centers with degradable thread.
- E. The erosion control blankets shall be SC150 as manufactured by North American Green, or equivalent.
- F. Material content:
 - 1. Matrix: 70% Straw Fiber (0.35 lbs/sy).
 - 2. 30% Coconut Fiber (0.15 lb/sy)
 - 3. Netting Top: Heavyweight photodegradable with UV additives (3.0 lbs/1,000 sf).
 - 4. Bottom: Lightweight photodegradable (1.50 lbs/1,000 sf).
 - 5. Thread: Degradable.
- G. The functional longevity of the erosion control blanket shall be approximately 24 months.
- H. The blankets shall be manufactured with a colored line or thread stitched along both outer edges (approximately 2 – 5 inches from the edge) to ensure proper material overlapping.
- I. All erosion control blankets shall be properly stored by the Contractor at the site per manufacturer's recommendations.
- J. Blankets damaged during storage shall be replaced at the Contractor's expense.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install erosion and sediment control measures and maintain in accordance with the Contract Documents.
- B. Provide and maintain Temporary Seeding at all times.

+ + END OF SECTION + +

SECTION 01 61 00

COMMON PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 DEFINITIONS

- A. Products:
 - 1. New items for incorporation into the Work, whether purchased by Contractor for the Project, or taken from previously purchased stock, and may also include existing materials or components required for reuse.
 - 2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software and terms of similar intent and is not intended to change meaning of such other terms used in the Contract Documents, as those terms are self-explanatory and have well recognized meanings in the construction industry.
 - 3. Items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature, that is current as of the date of the Contract Documents.

1.02 DESIGN REQUIREMENTS

- A. Where Contractor design is specified, design of installation, systems, equipment and components, including support and anchorage shall be in accordance with the requirements of the Contract Documents.

1.03 PREPARATION FOR SHIPMENT

- A. When practical, factory-assemble products. Mark or tag separate parts and assemblies to facilitate field-assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable protective coating.
- B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or crate to indicate its purchase order number, bill of lading number, contents by name, name of Project or Contractor, equipment number, and approximate weight. Include complete packing list and bill of materials with each shipment.
- C. Extra Materials, Special Tools, Test Equipment and Expendables:
 - 1. Furnish as required by individual Specification sections.
 - 2. Schedule:
 - a. Ensure that shipment and delivery occur concurrently with shipment of associated equipment.
 - b. Transfer to Owner shall occur immediately subsequent to Contractor's acceptance of equipment from Supplier.
 - 3. Packaging and Shipment:

- a. Package and ship extra materials and special tools to avoid damage during long-term storage in original containers insofar as possible, or in appropriately-sized hinged cover, wood, plastic or metal box.
 - b. Prominently display on each package, the following:
 - 1) Manufacturer's part nomenclature and number, consistent with Operation and Maintenance Data identification system.
 - 2) Applicable equipment description.
 - 3) Quantity of parts in package.
 - 4) Equipment manufacturer.
 - 5) Supplier if different from equipment manufacturer.
- D. Equipment Delivery: Contractor shall coordinate delivery schedules with respective Suppliers.
- E. Factory Test Results: Reviewed and accepted by Engineer before product shipment as required in individual Specification sections.

1.04 DELIVERY AND INSPECTION

- A. Deliver products in accordance with accepted current Progress Schedule and coordinate to avoid conflict with the Work and conditions at the site. Deliver anchor bolts and templates sufficiently early to permit setting prior to placement of structural concrete.
- B. Deliver products in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable.
- C. Unload products in accordance with manufacturer's instructions for unloading or as specified. Record receipt of products at the site. Promptly inspect for completeness and evidence of damage during shipment.
- D. Remove damaged products from Site and expedite deliver of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the Work.

1.05 HANDLING, STORAGE, AND PROTECTION

- A. Handle and store products in accordance with manufacturer's written instructions and in a manner to prevent damage. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.
- B. Manufacturer's instructions for material requiring special handling, storage, or protection shall be provided prior to delivery of material.

- C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration. Keep running account of products in storage to facilitate inspection and to estimate progress payments for products delivered, but not installed in the Work.
- D. Store electrical, instrumentation, and control products, and equipment with bearings in weather-tight structures maintained above 60 degrees F, and relative humidity at least five degrees above the dew point. Protect electrical, instrumentation, and control products, and insulate against moisture, water and dust damage. Connect and operate continuously space heaters furnished in electrical equipment.
- E. Store fabricated products above ground on blocking or skids, and prevent soiling or staining. Store loose granular materials in well-drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
- F. Store finished products that are ready for installation in dry and well-ventilated areas. Do not subject to extreme changes in temperature or humidity.
- G. After installation, provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.
- H. Provide offsite storage and protection when storage and protection cannot be provided on site.
- I. Hazardous Materials: Prevent contamination of personnel, storage area, and site. Meet requirements of product specification, codes and manufacturer's instructions.

1.06 GUARANTEES

- A. Manufacturer Warranties During Correction Period:
 - 1. Where indicated in the individual Specification sections, provide the required product warranty made out in the name of the Owner, coinciding with the correction period defined in Contract Documents for the particular piece of equipment and/or equipment System.
 - 2. One copy of each manufacturer warranty shall be provided to both Owner and Engineer within 30 days of successful commissioning of the System.

3. All requirements of the of the correction period defined in the Contract Documents shall apply to the manufacturer's warranty and the equipment supplier obligations shall be the same as Contractor obligations defined in the Contract Documents for the particular piece of equipment and/or equipment System covered by the warranty.
- B. Special Guarantees: Provide both Owner and Engineer one copy of special guarantees required in individual Specification sections. Special guarantees shall be made out in the Owner's name.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Provide manufacturer's standard materials suitable for service conditions, unless otherwise specified in the individual Specification sections.
- B. Where the Specifications include a named manufacturer, with or without model number, and also include performance requirements, named manufacturer's products must meet the performance requirements.
- C. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement, manufacturer's services, and implement same or similar process instrumentation and control functions in same or similar manner.
- D. Equipment, Components, Systems, and Subsystems: Design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with applicable OSHA, State and local health and safety regulations.
- E. Regulatory Requirements: Coating materials shall meet Federal, State, and local requirements limiting the emission of volatile organic compounds and for worker exposure.
- F. Safety Guards: Provide for all belt and chain drives, fan blades, couplings, and other moving or rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier galvanized steel or galvanized expanded steel mesh. Provide galvanized steel accessories and supports, including bolts. For outdoor applications, prevent entrance of rain and dripping water.

- G. Authority Having Jurisdiction (AHJ):
1. Provide the Work in accordance with NFPA 70, National Electric Code NFPA 70. Where required by the AHJ, material and equipment shall be labeled or listed by a nationally recognized testing laboratory or other organization acceptable to the AHJ in order to provide a basis for approval by code.
 2. Materials and equipment manufactured within the scope of standards published by Underwriter Laboratories, Inc. shall conform to those standards and shall have an applied UL listing mark.
- H. Equipment Finish:
1. Provide manufacturer's standard finish and color, except where specified color is indicated. Equipment scheduled to be field-painted shall be shop-primed with a primer compatible with the specified finish coating system. Comply with Section 09 90 00, Painting, for coating systems, including mil thickness.
 2. If manufacturer has no standard color, provide equipment with finish as approved by Owner.
- I. Special Tools and Accessories: Furnish to Owner, prior to placing in service, all accessories required to place each item of equipment in full operation. These accessory items include, but are not limited to, adequate oil and grease (as required for first lubrication of equipment after field testing), light bulbs, fuses, hydrant wrenches, valve keys, hand wheels, chain operators, special tools, and other spare parts as required for maintenance.
- J. Lubricant: Provide initial lubricant recommended by equipment manufacturer in sufficient quantity to fill lubricant reservoirs and to replace consumption during testing, Startup, and operation until Substantial Completion or partial occupancy of portions of the Work.

2.02 FABRICATION AND MANUFACTURE

- A. General:
1. Manufacture parts to U.S.A. standard sizes and gauges.
 2. Two or more items of the same type shall be identical, by the same manufacturer, and interchangeable.
 3. Design structural members for anticipated shock and vibratory loads.
 4. Use 1/4-inch minimum thickness for steel that will be submerged, wholly or partially, during normal operation.
 5. Modify standard products as necessary to meet performance specifications.

- B. Lubrication System:
 - 1. Require no more than weekly attention during continuous operation.
 - 2. Convenient and accessible; oil drains with bronze or stainless steel valves and fill plugs, easily accessible from the normal operating area or platform. Locate drains to allow convenient collection of oil during oil changes without removing equipment from its installed position.
 - 3. Provide constant-level oilers or oil level indicators for oil lubrication systems.
 - 4. For grease type bearings which are not easily accessible, provide and install stainless steel tubing, protect and extend tubing to convenient location with suitable grease fitting.

2.03 SOURCE QUALITY CONTROL

- A. Where Specifications allow for factory testing to be witnessed by the Engineer, notify Engineer not less than 14 days prior to proposed test date, unless otherwise specified.
- B. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous 12 months to a standard endorsed by the National Institute of Standards and Technology (NIST).
- C. Factory Tests:
 - a. Perform in accordance with accepted test procedures as supplemented in the Contract Documents.
 - b. Document successful completion.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage.
- B. Do not install material or equipment showing such effects.
- C. Remove damaged material or equipment from the Site and expedite delivery of identical new material or equipment.
- D. Delays to the Work resulting from material or equipment damage that necessitates procurement of new products will be considered delay within the Contractor's control.

3.02 INSTALLATION

- A. Drawings show general locations of equipment, devices, and raceway, unless specifically dimensioned.
- B. No shimming between machined surfaces is allowed.
- C. Install the electrical components in accordance with National Electrical Contractors Association (NECA) National Electrical Installation Standards.
- D. Repaint painted surfaces that are damaged prior to equipment acceptance.
- E. Do not cut or notch any structural member or building surface without specific approval of Engineer.
- F. Handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's instructions, and as may be specified. Retain a copy of manufacturers' instructions at the site, available for review at all times.

3.03 FIELD FINISHING

- A. In accordance with Section 09 90 00, Painting.

3.04 ADJUSTMENT AND CLEANING

- A. Perform required adjustments, tests, operational checks, and other startup activities.

3.05 LUBRICANTS

- A. Fill lubricant reservoirs and replace consumption during testing, startup, and operation prior to delivery to Owner.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUBMITTALS

- A. Informational Submittals:
 - 1. Submit prior to application for payment:
 - a. Record documents: as required in the Contract Documents, and as specified herein.
 - 2. One (1) hard copy, one (1) electronic copy, and one (1) copy on a thumb drive, submitted as a single submittal (refer to Section 01 78 23, Operation and Maintenance Data).

1.02 RECORD DOCUMENTS

- A. Quality assurance:
 - 1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
 - 2. Accuracy of Records:
 - a. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
 - b. Purpose of Project Record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.
 - 3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

3.01 MAINTENANCE OF RECORD DOCUMENTS

- A. General:
 - 1. Revise approved shop drawings to reflect as-built conditions, including control logic, interlocks, fail-safes, etc.

2. Record information concurrently with construction progress and within 24 hours after receipt of information that a change has occurred. Do not cover or conceal Work until required information is recorded.
- B. Preservation:
1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
 2. Make documents and Samples available at all times for inspection and review by the Engineer.
- C. Making Entries on Drawings:
1. Date entries.
 2. Call attention to entry by revision “cloud” drawn around area or areas affected.
 3. Legibly mark to record actual changes made during construction, including, but not limited to:
 - a. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
 - b. Horizontal and vertical locations of existing and new underground facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
 - c. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
 - d. Changes made by addendum, field order, work change directive, change order, and Engineer’s written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.
 4. Dimensions on Schematic Layouts: Show on record drawings by dimension, the centerline of each run of items such as are described in previous subparagraphs above.
 - a. Clearly identify the item by accurate note such as “cast iron drain”, “galvanized water”, etc.
 - b. Show, by symbol or note, vertical location of item (“under slab”, “in ceiling plenum”, etc).
 - c. Make identification so descriptive that it may be related reliably to specifications.

3.02 FINAL CLEANING

- A. At completion of the Work or of a part thereof and immediately prior to Contractor’s request for certificate of Substantial Completion, or if no certificate is issued, immediately prior to Contractor’s notice of completion, clean entire site or parts thereof, as applicable.

- B. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to the Owner.
- C. Remove grease, dirt, dust paint or plaster spatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
- D. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
- E. Clean all windows.
- F. Clean and wax wood, vinyl, or painted floors.
- G. Broom clean exterior paved driveways and parking areas.
- H. Hose clean sidewalks, loading areas, and others contiguous with principal structures.
- I. Rake clean all other surfaces.
- J. Remove snow and ice from access to buildings.
- K. Replace air-handling filters and clean ducts, blowers, and coils of ventilation units operated during construction.
- L. Leave water courses, gutters, and ditches open and clean.
- M. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

END OF SECTION

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

- A. Detailed information for the preparation, submittal, and Engineer's review of Operations and Maintenance (O&M) Data, as required by individual Specification sections.

1.02 DEFINITIONS

- A. Preliminary Data: Initial and subsequent submissions for Engineer's review.
- B. Final Data: Engineer-accepted data, submitted as specified herein.
- C. Data Compilation: Compilation of all equipment and system O&M Final Data into one set including all field testing data and results, final control diagrams, and all modifications developed during field testing, Startup, and commissioning.
- D. Maintenance Operation: Any routine operation required to ensure satisfactory performance and longevity of equipment. Examples of typical maintenance operation are lubrication, belt tensioning, adjustment of pump packing glands, and routine adjustments.

1.03 SEQUENCING AND SCHEDULING

- A. Equipment and System Data:
 - 1. Preliminary Data:
 - a. Do not submit until Shop Drawings for equipment or System has been reviewed and approved by Engineer.
 - b. Submit prior to shipment date.
 - 2. Final Data: Submit 30 days prior to the proposed start of associated field testing.
 - 3. Data Compilation: Submit prior to Substantial Completion of the Project. An accepted Data Compilation submittal is a prerequisite for Substantial Completion.

1.04 DATA FORMATS

- A. Instructional Manual Format:
 - 1. Hard Copies:
 - a. Binder: Commercial-quality, permanent three-ring or three-post binders with durable plastic cover.

- b. Spine:
 - 1) Project Title.
 - 2) Identify volume number if more than one volume.
 - c. Paper: 20-pound minimum, white for typed pages.
 - d. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
 - e. Size: 8-1/2 inches by 11 inches, minimum.
 - f. Three-hole punch data for binding and composition; arrange printing so that punched holes do not obliterate data.
 - g. Material shall be suitable for reproduction, with quality equal to original. Photocopying of material will be acceptable, except for material containing photographs.
2. Organization:
- a. Cover: Identify manual with typed or printed title “OPERATION AND MAINTAINENCE DATA”, and list:
 - 1) Project title.
 - 2) Designate applicable system, equipment, material, or finish.
 - 3) Identity of separate structure as applicable.
 - 4) Identify volume number if more than one volume.
 - 5) Identity of general subject matter covered in manual.
 - b. Title Page:
 - 1) Contractor name, address, and telephone number.
 - 2) Subcontractor, Supplier, installer, or maintenance contractor’s name, address, and telephone number, as appropriate.
 - a) Identify area of responsibility of each.
 - b) Provide name and telephone number of local source of supply for parts and replacement.
 - c. Table of Contents:
 - 1) Neatly typewritten and arranged in systematic order with consecutively numbered pages.
 - 2) Identify each product by product name and other identifying numbers or symbols, as set forth in the Contract Documents.
 - d. Text: Manufacturer’s printed data, or neatly typewritten.

B. Data Compilation Format:

- 1. Hard Copies:
 - a. Binder: Commercial quality, permanent, three-ring or three-post binders with durable plastic cover.
 - b. Section dividers: Heavy, 80-pound cover weight, tabbed with numbered plastic index tabs.
- 2. Organization:
 - a. Compile all Engineer-accepted O&M Preliminary Data into a one set with multiple volumes as needed.
 - b. Each volume shall consist of the following:

- 1) Cover: Identify each volume with typed or printed title “OPERATION AND MAINTENANCE DATA, VOLUME No. XX” and list:
 - a) Project title.
 - b) Contractor’s name, address, and telephone number.
 - c) If entire volume covers equipment or system provided by one Supplier, include the following:
 - i) Identity of general subject matter covered in manual.
 - ii) Identity of equipment number and Specification section.
- 2) Provide each volume with title page and a table of contents with consecutively numbered pages. Place contents of entire set, identified by volume number, in each binder or electronic file.
- 3) Table of contents neatly typewritten, arranged in a systematic order:
 - a) Include list of each product, indexed to content of each volume.
 - b) Designate system or equipment for which it is intended.
 - c) Identify each product by product name and other identifying numbers or symbols.
- 4) Fly leaf:
 - a) For each separate product, or each piece of operating equipment, with typed description of product and major component parts of equipment.
 - b) List with each product:
 - i) Name, address, and telephone number of Subcontractor, Supplier, installer and maintenance contractor, as appropriate.
 - ii) Identify area of responsibility of each.
 - iii) Provide local source of supply for parts and replacement.
 - c) Identity of separate structure as applicable.
- c. Assemble material, as much as possible, in same order as specified in the Contract Documents.

C. Electronic Copies

1. Searchable portable document format (PDF).
2. Bookmarks for all sections included in the Table of Contents.

1.05 SUBMITTALS

- A. Informational:
 - 1. Data outline: Submit an electronic copy of a detailed outline of proposed organization and contents of Final Data prior to preparation of Preliminary Data.
 - 2. Preliminary Data:
 - a. Submit an electronic copy for Engineer's review.
 - b. If data meets conditions of the Contract:
 - 1) One copy will be returned to Contractor.
 - 2) One copy will be retained by Engineer.
 - c. If data does not meet conditions of the Contract:
 - 1) All copies will be returned to Contractor with Engineer's comments (on separate document) for revision.
 - 2) Engineer's comments will be retained in Engineer's file.
 - 3) Resubmit an electronic copy revised in accordance with Engineer's comments.
 - 3. Final Data: Submit two copies in format specified herein.
 - 4. Data Compilation: Submit two hard copies and two electronic copies on flash drives.

1.06 DATA FOR EQUIPMENT AND SYSTEMS

- A. Content for each unit (or common units) and System:
 - 1. Product Data:
 - a. Include only those sheets that are pertinent to specific product.
 - b. Clearly annotate each sheet to:
 - 1) Identify specific product or part installed.
 - 2) Identify data applicable to installation.
 - 3) Delete references to inapplicable information.
 - c. Function, normal operating characteristics, and limiting conditions.
 - d. Performance curves, engineering data, nameplate data, and tests.
 - e. Complete nomenclature and commercial number of replaceable parts.
 - f. Original manufacturer's parts list, illustrations, detailed assembly drawings showing each part with part numbers and sequentially numbered parts list, and diagrams required for maintenance.
 - g. Spare parts ordering instructions.
 - h. Where applicable, identify installed spares and other provisions for future work (e.g. reserved panel space, unused components, wiring, terminals, etc).

2. As-installed, color-coded piping diagrams.
3. Charts of valve tag numbers, with the location and function of each valve.
4. Drawings: supplement product data with drawings as necessary to clearly illustrate:
 - a. Format:
 - 1) Provide reinforced, punched, binder tab; bind in with text.
 - 2) Reduced to 8-1/2 inches by 11 inches, or 11 inches by 17 inches, folded to 8-1/2 inches by 11 inches for hard copies.
 - 3) Where reduction is impractical for hard copies, fold and place in 8-1/2 inch envelopes.
 - b. Relations of component parts of equipment and systems.
 - c. Control and flow diagrams.
 - d. Coordinate drawings with Project record documents to assure correct illustration of completed installation.
5. Instructions and Procedures: Written text, as required to supplement product data.
 - a. Format:
 - 1) Organize in consistent format under separate heading for each different procedure.
 - 2) Provide logical sequence of instructions for each procedure.
 - 3) Provide information sheet for Owner's personnel, including:
 - a) Proper procedures in event of failure.
 - b) Instances that might affect validity of guarantee or Bond.
 - b. Installation Instructions: Including alignment, adjusting, calibrating, and checking.
 - c. Operating Procedures:
 - 1) Startup, break-in, routine, and normal operating instructions.
 - 2) Test procedures and results of factory tests where required.
 - 3) Regulation, control, stopping and emergency instructions.
 - 4) Description of operation sequence by control manufacturer.
 - 5) Shutdown instructions for both short and extended duration.
 - 6) Summer and winter operating instructions, as applicable.
 - 7) Safety precautions.
 - 8) Special operating instructions.

- d. Maintenance and Overhaul Procedures:
 - 1) Routine maintenance.
 - 2) Guide to troubleshooting.
 - 3) Disassembly, removal, repair, reinstallation, and re-assembly.
- B. Content for Each Electric or Electronic Item or System:
 - 1. Description of Unit and Component Parts:
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, nameplate data, and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 - d. Interconnection wiring diagrams, including control and lighting systems.
 - 2. Circuit Directories of Panelboards.
 - 3. Electric service.
 - 4. Control requirements and interfaces.
 - 5. Communication requirements and interfaces.
 - 6. List of electrical relay settings, and control and alarm contact settings.
 - 7. Electrical interconnection wiring diagram, including as applicable, single-line, three-line, schematic and internal wiring, and external interconnection wiring.
 - 8. As-installed control diagrams by Controls System Integrator (CSI).
 - 9. Operating procedures:
 - a. Routine normal operating instructions.
 - b. Startup and shutdown sequences, normal and emergency.
 - c. Safety precautions.
 - d. Special operating instructions.
 - 10. Maintenance Procedures:
 - a. Routine maintenance.
 - b. Guide to troubleshooting.
 - c. Adjustment and checking.
 - d. List of relay settings, control and alarm contact settings.
 - 11. Manufacturer's printed operating and maintenance instructions.
 - 12. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

1.07 DATA FOR MATERIALS AND FINISHES

- A. Content for Architectural Products, Applied Materials, and Finishes:
 - 1. Manufacturer's data, giving full information on products:
 - a. Catalog number, size, and composition.
 - b. Color and texture designations.
 - c. Information required for re-ordering special-manufactured products.

2. Instructions for Care and Maintenance:
 - a. Manufacturer's recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods that are detrimental to product.
 - c. Recommended schedule for cleaning and maintenance.
- B. Content for Moisture Protection and Weather Exposed Products:
 1. Manufacturer's data, giving full information on products:
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 2. Instructions for inspection, maintenance, and repair.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

END OF SECTION

SECTION 02 40 00

DEMOLITION AND REMOVAL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Demolition and Removal, as shown on the Drawings, as specified and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. American National Standards Institute, Inc. (ANSI) Publications:
 - a. A10.4 - Safety Requirements for Personnel Hoists and Employee Elevators for Construction and Demolition Operations
 - b. A10.6 - Demolition Operations – Safety Requirements
 - 2. National Fire Protection Association (NFPA) Publication:
 - a. 241 - Safeguarding Construction, Alteration and Demolition Operations
 - 3. New York Code Rule and Regulations/Department of Labor:
 - a. 12 NYCRR - Protection in Construction, Demolition and Part 23 Excavation Operations
 - 4. Occupational Safety and Health Administration (OSHA) Regulations:
 - a. 29 CFR Part 1926 - Regulations for Construction

1.03 GENERAL REQUIREMENTS

- A. Do not begin demolition until authorization is received from the Engineer. Remove rubbish and debris from the project site daily; do not allow accumulations inside or outside the building. Store materials that cannot be removed daily in areas specified by the Engineer.

1.04 SUBMITTALS: Submit the following:

- A. Statements:
 - 1. Demolition planSubmit proposed demolition and removal procedures to the Engineer for approval before work is started. Include disconnection schedule of existing system and a detailed description of methods and equipment to be used for each operation and of the sequence of operations.

1.05 REGULATORY AND SAFETY REQUIREMENTS

- A. Comply with Federal, State, and local hauling and disposal regulations. In addition to the requirements of the "General Requirements", safety requirements shall conform with ANSI A10.4, ANSI A10.6, NFPA 241, 12 NYCRR Part 23 and OSHA 29 CFR Part 1926.

1.06 DUST AND DEBRIS CONTROL

- A. Prevent the spread of dust and debris to occupied portions of the building and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Vacuum and dust the work area as needed.

1.07 PROTECTION

- A. Traffic Control Signs: Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Engineer prior to beginning such work.
- B. Existing Work: Protect existing work which is to remain in place, be reused, or remain the property of the Owner. Repair items which are to remain and which are damaged during performance of the work to their original condition, or replace with new. Do not overload structural elements and pavements to remain. Provide new supports and reinforcement for existing construction weakened by demolition or removal work. Repairs, reinforcement, or structural replacement must have Engineer approval.
- C. Trees: Protect trees where shown.
- D. Facilities: Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.

1.08 BURNING

- A. Burning will not be permitted.

PART 2 - PRODUCTS

[NOT USED.]

PART 3 - EXECUTION

3.01 EXISTING FACILITIES TO BE REMOVED

- A. Structures: Remove indicated existing structures.
- B. Utilities and Related Equipment: Remove existing utilities, as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Engineer. Remove meters and related equipment and deliver to a location in accordance with instructions of the Engineer. If utility lines are encountered that are not shown on drawings, contact the Engineer for further instructions.
- C. Paving and Slabs: Remove sawcut concrete and asphaltic concrete paving and slabs. Provide neat sawcuts at limits of pavement removal as indicated.
- D. Masonry: Sawcut and remove masonry so as to prevent damage to surfaces to remain and to facilitate the installation of new work. Where new masonry adjoins existing, the new work shall abut or tie into the existing construction as specified for the new work.
- E. Concrete: Saw concrete along straight lines to a depth of not less than 2 inches. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete.
- F. Patching: Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:
 - 1. Holes and depressions left as a result of removals in existing masonry walls to remain shall be completely filled with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

3.02 FILLING

- A. Fill holes, open basements, and other hazardous openings in accordance with Section 31 23 23, "Fill" as indicated.

3.03 DISPOSITION OF MATERIAL

- A. Title to Materials: Except where specified in other sections, all materials and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from Owner's property. Title to materials resulting from demolition, and materials and equipment to be removed, is vested in the Contractor upon approval by the Engineer of the Contractor's demolition and removal procedures, and authorization by the Engineer to begin demolition. The Owner will not be responsible for the condition or loss of, or damage to, such property after notice to proceed. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

3.04 CLEANUP

- A. Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage on pavements, streets or adjacent areas. Limit to 3/8-cubic yard capacity buggies or other conveyances used on roofs and within the building to transport removed debris. Clean up spillage from pavements, streets and adjacent areas.

END OF SECTION

SECTION 02 65 00.20

PETROLEUM BULK STORAGE TANK REMOVAL AND CLOSURE

PART 1 - GENERAL

1.01 SUMMARY

- A. Under this Section, Contractor shall furnish all labor, materials, supervision and equipment for petroleum bulk storage tank removal and closure in accordance with all applicable laws, rules and regulations, as shown on the Drawings, as specified and/or directed.
- B. Related work specified elsewhere:
 - 1. Section 02 40 00, Demolition and Removal.
 - 2. Section 31 05 13, Soils for Earthwork.
 - 3. Section 31 05 16, Aggregates for Earthwork.
 - 4. Section 31 22 13, Subgrade Preparation.
 - 5. Section 31 23 16, Excavation.
 - 6. Section 31 23 23, Fill.

1.02 REFERENCE STANDARDS

- A. The following is a list of standards and their latest revisions that may be referenced in this Section:
 - 1. American Petroleum Institute (API):
 - a. RP 1604, Closure of Underground Petroleum Storage Tanks.
 - b. STD 1631, Interior Lining and Periodic Inspection of Underground Storage Tanks.
 - c. STD 2015, Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks.
 - d. RP 2217A, Safe Work in Inert Confined Spaces in the Petroleum and Petrochemical Industries.
 - e. RP 2219, Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service.
 - 2. Fire Code of New York State:
 - a. 23, Motor Fuel-Dispensing Facilities and Repair Garages.
 - b. 50, Hazardous Materials – General Provisions.
 - c. 57, Flammable and Combustible Liquids.
 - 3. National Fire Protection Association, Inc. (NFPA):
 - a. 30, Flammable and Combustible Liquids Code.
 - b. 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages.
 - c. 69, Standard on Explosion Prevention Systems.
 - d. 77, Recommended Practice on Static Electricity.
 - e. 306, Standard for the Control of Gas Hazards on Vessels.

- f. 326, Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair.
 - g. 327, Standard Procedures for Cleaning or Safeguarding Small Tanks and Containers.
- 4. National Institute for Occupational Safety and Health:
 - a. 80-106, Criteria for a Recommended Standard: Working in Confined Spaces.
- 5. New York State Department of Environmental Conservation (NYSDEC):
 - a. 6 NYCRR Part 613, Petroleum Bulk Storage.
 - b. 6 NYCRR Parts 569-599, Chemical Bulk Storage.
 - c. DER-10, Technical Guidance for Site Investigation and Remediation.
- 6. United States Code of Federal Regulations (CFR):
 - a. 29 CFR 1910.134, Respiratory Protection.
 - b. 29 CFR Part 1910.146, Permit-Required Confined Spaces.
 - c. 29 CFR Part 1910.650-652, Excavations and Trenching Operations.
 - d. 40 CFR Part 280, Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (USTs).

1.03 SUBMITTALS

- A. Comply with Section 01 33 00, Submittal Procedures.
- B. Action submittals:
 - 1. (Not Used)
- C. Informational submittals:
 - 1. Tank closure plan:
 - a. Contractor shall submit a written tank closure plan for the closure of petroleum bulk storage tanks at the Site. At minimum, tank closure plan shall include:
 - 1) Identification of proposed schedule and tasks required for closure of the tanks identified on the Drawings.
 - 2) Expected modifications to standard operating procedure required due to site specific features.
 - 3) Figures and working drawings identifying the limits of the area required for Contractor's equipment, and the proposed on-site staging location for placement of contaminated soils, if found in the excavation.
 - 4) Methods to be used for tank cleaning and removal.
 - 5) Contingency plans and mitigation measures to control and contain the petroleum contaminated soil on site.
 - 6) Description of methods to be employed to prevent impact to storm water from petroleum contaminated soils if encountered.

- 7) Means and methods to brace underground utilities that will be affected by excavation work.
 - b. The staging of contaminated soils shall be within the areas approved by Owner and Engineer.
 - c. Contractor is responsible for field locating all utilities prior to excavation.
- 2. Waste disposal:
 - a. Contractor shall submit:
 - 1) A list of the proposed permitted disposal sites and facilities for the ultimate disposal of remaining and residual tank fluids, tank sludge, the storage tanks, and contaminated soils and fluids.
 - 2) Copies of operating permits for facilities identified above.
 - 3) Waste transporter permits for all vehicles to be used for the project.
 - 4) Certified scale house to be utilized for weighing wastes.
 - 5) Copies of all shipping manifests, bills of lading, etc. for all materials transported for disposal including: remaining and residual tank fluids, tank sludges, storage tanks and accessories, and petroleum contaminated soils and fluids.
 - 6) Tank clean certificate.
- 3. Contractor shall submit the following written safety plans prior to initiating on-site work, along with a copy of the supervisor's qualifications and experience for Engineer review:
 - a. Health and Safety Plan.
 - b. Confined Space Entry Plan.
 - c. Trenching and Excavation Safety Plan.
- 4. Contractor shall submit copies of all of the following to Owner weekly:
 - a. Confined Space Entry Permits.

1.04 QUALITY ASSURANCE

- A. Contractor shall develop, implement, maintain, supervise and be responsible for all tank removal work.
- B. The following requirements apply:
 - 1. When requested by the Owner/Engineer, each Bidder shall submit a statement of the Bidder's qualifications, experience with similar petroleum bulk storage tank removal and closure work, and organization and equipment available for the work contemplated.
 - 2. Owner shall have the right to take such steps as deemed necessary to determine the ability of the Bidder to perform the obligations under the Contract, and the Bidder shall furnish the Owner all such information and data for this purpose as requested.
 - 3. The right is reserved to reject any Contractor where an investigation of the available evidence or information does not satisfy Owner/Engineer that

Contractor is qualified to carry out properly the terms of the tank removal work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Federal, State, and local regulations governing the handling, transport, and disposal of petroleum and petroleum contaminated products, and non-hazardous and hazardous wastes.

1.06 SEQUENCING

- A. Facilities:
 - 1. Protect electrical and mechanical services and utilities.
 - 2. Where removal of existing utilities is required to complete the work, provide written notice of interruption and approved temporary services or connections for electrical and mechanical utilities.
- B. Relocations:
 - 1. Perform temporary relocation of utilities and site features located adjacent to the work area which will impair the tank removal.
 - 2. Relocation of all existing utilities and site features must be approved and coordinated with Engineer and Owner.
 - 3. Perform the removal and reinstallation of approved items with workmen skilled in the trades involved.
 - 4. Repair items to be relocated which are damaged or replace damaged items with new undamaged items, at no additional expense to Owner, and as approved by Engineer.

1.07 SCHEDULING

- A. All storage tank closure and removals shall be scheduled during normal work hours.

PART 2 - PRODUCTS

(Not used)

PART 3 - EXECUTION

3.01 PREPARATION

- A. Notification:
 - 1. Contractor shall notify the local Fire Marshal and local building codes office of the intent to conduct the tank removals 30 days prior to the work and shall notify the Engineer at least 72 hours prior to commencing petroleum bulk storage tank removal and closure activities.

2. If the tank is registered, or required to be registered with New York State Department of Environmental Conservation, notification shall be coordinated with the submittal of a Pre-Work Notification for Bulk Storage (PBS or CBS) Tank Installation or Closure form identifying removal of the tanks to be submitted by the Contractor 30 days prior to the planned work with a copy also provided to the Engineer.
 3. Provide a copy of the Department's approval of the notice of intent to close the tank to Engineer.
 4. Contractor shall notify Dig Safely New York, Inc. to locate and clearly mark all subsurface utilities in the area prior to start of work.
- B. Contractor shall not begin work until the project areas are demarcated and work area provided with wooden barricades to prevent pedestrian access, all nearby utilities are identified, and temporary chain link construction fencing has been installed to protect the work areas and all open excavations.
- C. Utilities:
1. Building utilities may exist within the vicinity of the tank removal areas which are not identified on the Drawings.
 2. Retain the services of a private utility locating firm to locate all buried utilities on the Site. Contractor will coordinate the identification of existing buried utilities with Owner's representatives, and underground utility locating services in the area.
 3. Contractor will be responsible for repair or all damage to existing utilities, at no additional cost to Owner.
- D. Surface preparation:
1. Remove topsoil (if applicable), and saw cut existing pavement and concrete within all work areas.
 2. If concrete items require removal to complete the work (e.g., curbing, sidewalks, etc.), Contractor shall provide replacement items to match existing or improved conditions.

3.02 PETROLEUM CONTAMINATED FLUIDS

- A. Residual tank fluids and sludges:
1. Contractor shall remove all remaining tank fluids. The quantity of remaining tank fluids removed shall be determined by direct measurement of the vacuum truck tank or other vessel prior to removal from the Site, and this quantity shall be reported to Engineer daily.
 2. Contractor shall provide for the removal, containerization, testing, loading, transport, and disposal of remaining tank fluids and sludges.
 3. All material removed from the tanks shall be collected and containerized for disposal at a properly permitted facility in accordance with local, State and Federal regulations.

- B. Petroleum contaminated groundwater:
1. At the discretion of Engineer, petroleum contaminated groundwater encountered during the tank removals shall be collected for proper disposal.
 2. The quantity of petroleum contaminated groundwater removed shall be determined by direct measurement of the vacuum truck tank or other vessel prior to removal from the Site, and this quantity shall be reported to Engineer daily.
 3. Contractor shall provide for the removal, containerization, testing, loading, transport, and disposal of petroleum contaminated groundwater.
 4. Any groundwater contaminated due to negligence by Contractor during cleaning and/or removal of the tanks and all associated appurtenances shall be the responsibility of Contractor to remove and dispose of in accordance with applicable regulations at the expense of Contractor.
 5. Petroleum contaminated groundwater shall be disposed of in accordance with local, State and Federal Regulations.

3.03 TANK AND PIPING DEMOLITION

- A. Petroleum storage tank cleaning:
1. Contractor shall access the tank top, remove remaining tank fluids, purge and test atmospheres, access the tank, clean tank interior, and mop dry.
 2. All sludges and wash fluids generated during the flushing and cleaning shall be captured and disposed of in accordance with local, State and Federal regulations, and shall be included in Alternate 01 (Pay Item 1).
 3. The Contractor shall protect existing site surfaces, materials, and structures from inadvertent contamination from cleaning and removal operations.
 4. The tank sludges and solids encountered during cleaning that cannot be disposed of with the fluids shall be removed and disposed of in accordance with the laws, regulations, and guidelines as identified above.
- B. Piping and equipment removal:
1. Prior to the removal of the tank petroleum piping and equipment, Contractor shall remove excess fluids from all piping, containment systems, and equipment and flush and clean thoroughly.
 2. All sludges and wash fluids generated during the flushing and cleaning shall be captured and disposed of in accordance with local, State and Federal regulations, and shall be included in Alternate 01 (Pay Item 1).
 3. The pipes, equipment, and solids encountered during cleaning that cannot be disposed of with the fluids shall be removed and disposed of in accordance with the laws, regulations, and guidelines as identified above.
 4. All piping including electrical conduit associated with the tank shall be completely removed to the interior face of any associated building wall. Piping shall be reduced to appropriate lengths and cleaned of all contaminated materials. Sleeves and piping passing through walls shall be

flushed clean and then permanently capped and plugged on the outside in a manner approved by Engineer.

- C. Petroleum storage tank removal and closure:
1. Contractor shall confirm that any electrical power connected to the tanks or its ancillary equipment has been deactivated and the actual wiring properly dismantled at the circuit breaker(s).
 2. Close and remove tanks and appurtenances including, but not limited to:
 - a. The tank, pumps, dispensers and piping systems, all fittings, all piping from the tanks to the equipment serviced as indicated on the Drawings.
 - b. All associated vent piping, fill and monitoring manhole connections, manholes, containment piping and sumps.
 - c. Tank monitoring and gauging systems, grounding systems, cathodic protection, tank top structures, and all anchorage systems.
 3. All removal activities shall be conducted in accordance with local, State and Federal regulations.

3.04 DISPOSAL

- A. Soil Assessment:
1. Engineer will utilize and provide a photoionization detector (PID) capable of detecting the presence of petroleum vapors during the tank removal.
 2. The PID shall be utilized to screen soils located in proximity to the petroleum tank and piping systems for the presence of petroleum vapors during tank excavation.
 3. The screening will be conducted on successive 2 foot lifts removed from the ground.
 4. If the PID identifies the presence of petroleum vapors in the soils, then the Engineer will direct the soils to be staged in a separate on-site contaminated soils pile.
 5. All contaminated soils piles and equipment shall be placed on a minimum 6-mil reinforced plastic sheeting, and covered with same.
 6. The cover shall be weighted with sandbags, tires, rope, or other means which do not penetrate the membrane.
- B. Tank or piping pit assessment:
1. Following the removal of the tank, piping, or aboveground tank slab from the ground, Engineer will conduct an assessment of the excavation side walls and bottom.
 2. The PID will be utilized to assess the presence of residual petroleum contaminated soils located in the excavation.
 3. Contractor shall remove visibly contaminated soils from the excavation for placement on the on-site contaminated soil staging piles, in accordance with the approval of Engineer.
 4. Soil located in the proximity of building foundations, and/or utilities shall not be removed so as to not undermine the integrity of these installations.

5. If contaminated soils extend significantly beyond the tank or piping pit areas, then additional soils shall be removed at the discretion of Engineer.
 6. The actual tonnage of petroleum contaminated soil, as measured by disposal facility weigh tickets, shall be reported to Engineer daily.
 7. Once the visibly contaminated soils have been removed from the tank or piping pits, and the absence of significant remaining contamination has been confirmed with the PID, Contractor shall provide access for Engineer to obtain representative samples of the soil from the four sidewalls and bottom of each tank or piping excavation.
 8. The actual location of the samples will be determined in the field, based on the site conditions, and under the direction of Engineer.
 9. The soil samples will be submitted by Engineer to a New York State Department of Health approved laboratory for analysis of petroleum compounds.
- C. Transport and disposal:
1. Contaminated soil disposal sampling and analysis shall be completed by the Contractor in accordance with the requirements of the approved disposal facility.
 2. The Contractor shall characterize, containerize, transport, and dispose of all materials at the designated disposal/recycling facility.

3.05 RESTORATION

- A. Backfilling:
1. Contractor shall provide backfill for the tank or piping pit excavation in accordance with Section 310513, Soils for Earthwork; Section 310516, Aggregates for Earthwork; and, Section 312323, Fill.
- B. Site Restoration:
1. Final surfaces are to be returned to the condition existing prior to removal of the tank or piping, unless otherwise noted on the Drawings.
- C. Cleanup:
1. Remove and transport all non-petroleum related debris and rubbish in a manner that will prevent spillage in buildings, parking lots, and adjacent areas.
 2. Contractor will remove debris for disposal at a licensed facility off-site.

END OF SECTION

SECTION 03 21 00
REINFORCING STEEL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for installing all Reinforcing Steel, welded wire reinforcement and accessories for cast-in-place concrete as shown on the Plans, as specified, and/or directed.

1.02 REFERENCES

- A. Reference to standard specifications for the following organizations is intended to specify minimum standards for quality of materials and performance of workmanship, and for standard test methods.
 - 1. American Society for Testing and Materials (ASTM) Publications, Latest Edition
 - 2. American Concrete Institute (ACI) Standards, Latest Edition
 - 3. American Welding Society (AWS) Publications, Latest Edition
 - 4. American National Standards Institute (ANSI) Publications, Latest Edition
 - 5. Concrete Reinforcing Steel Institute (CRSI) Publications, Latest Edition

1.03 SUBMITTALS

- A. Shop Drawings: Indicate bar sizes, spacings, locations and quantities of reinforcing steel and welded wire reinforcement sheets, bending and cutting schedules, and supporting and spacing devices. No work on fabricating or placing steel shall be done until such drawings and schedules have been approved.
- B. Manufacturer's Certificate: Submit certified copies of mill test report of reinforcement materials analysis.
- C. Welder's Certificate: Submit certification from welders employed on the work, verifying AWS qualification within the previous twelve months.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Reinforcing steel bars shall be free from defects, kinks, bends, rust, scale or other irregularities. Welded wire reinforcement shall be of the electrically welded type, with wires arranged in rectangular or square patterns.

- B. Reinforcing bars shall be deformed billet steel meeting the requirements of ASTM A615 Grade 60.
- C. Steel welded wire reinforcement (WWR) shall meet the requirements of ASTM A1064.
- D. Stirrup steel shall be cold drawn steel wire meeting the requirements of ASTM A82.
- E. Where indicated, epoxy coated reinforcing bars shall be deformed billet steel meeting the requirements of ASTM A775, Grade 60.
- F. Where indicated, galvanized reinforcing bars shall be deformed billet steel meeting the requirements of ASTM A767, Grade 60.
- G. Accessory materials shall include: tie wire, minimum 16 gage annealed type. Epoxy-coated reinforcing bars shall be tied with plastic-; epoxy-; or nylon-coated tie wire. Chairs, bolsters, bar supports, and spacers shall be sized and shaped for strength and support of reinforcement during concrete placement conditions.

2.02 IDENTIFICATION AND PROTECTION OF REINFORCING BARS AND WELDED WIRE REINFORCEMENT:

- A. Reinforcing steel shall be delivered to the work in strongly tied bundles identified with metal tags corresponding to the bar schedules and diagrams. Identification marks shall show quantity, producing mill, bar size, type of steel and grade mark.
- B. All bars and WWR shall be stored off the ground and shall, at all times, be protected from moisture and be kept free from dirt, oil, or injurious coatings. Epoxy-coated reinforcing bars shall be stored on protective cribbing. If concreting is delayed for any considerable number of days after the reinforcing is placed in position, it shall be protected by covering with canvas or other satisfactory covering, or, if directed, shall be painted with a coat of neat cement grout.
- C. Any bar or WWR having a scaly rust shall be cleaned. Epoxy-coated reinforcing bars that are cut, welded or otherwise damaged shall be repaired with patching material conforming to ASTM A775 and done in accordance with the Material Manufacturer's recommendation. Galvanized reinforcing bars that are cut, welded or otherwise damaged shall be repaired with patching material conforming to ASTM A767 and done in accordance with the Material Manufacturer's recommendation. The Contractor will be required to replace bars exhibiting severely damaged coatings.

PART 3 - EXECUTION

3.01 FABRICATION AND INSTALLATION:

- A. Metal reinforcing shall be properly fabricated in accordance to references specified.
- B. Metal reinforcing shall be properly placed in accordance to CRSI, ACI 301, ACI 318, ACI SP-66, as shown on the approved Shop Drawings and as herein directed.
- C. Bars shall be bent in the shop to the shapes shown or required. Field bending shall be done only with the written approval of the Engineer. Field welding shall not be allowed without direct approval and supervision of the Engineer.
- D. Unless otherwise shown, splices in tension reinforcement shall not be permitted, and splices in compression reinforcement shall be lapped 40 diameters. All bar splices shall be staggered, wherever possible. Locate splices not indicated on drawings, at point of minimum stress. Splice locations must be approved by the Engineer.
- E. Reinforcing shall be securely tied and supported and must not be displaced during concrete placing operations. Epoxy-coated reinforcing bars shall rest on coated wire bar supports, or other acceptable materials. Dowels must be wired in place before concreting begins. All metal shall be kept away from exposed surfaces of concrete.
- F. Conduit in slabs on grade shall be placed in a depression below the slab and the reinforcement run continuous over conduit. Conduit in slabs on forms shall be above the bottom reinforcing and below the top reinforcing. No conduit is permitted in thin joist slabs.
- G. Cutting of bars to clear openings in walls or slabs is strictly prohibited. Warp bars around such openings.
- H. Provide two #5 diagonal bars at each corner of every rectangular opening in walls, unless otherwise shown on the Plans.
- I. All slabs, unless otherwise shown on the Plans, to be reinforced with not less than 6 x 6 - W2.9 x W2.9 WWR (welded wire reinforcement), supported on approved fabricated, corrosion resistant chairs and located as specified. Supports shall be spaced as required to continuously maintain the specified reinforcement location within the slab thickness prior to and during slab concrete placement.

- J. Placing of concrete shall not be scheduled until all of the reinforcing for the section is secured in place and the reinforcing and forms have been approved by the Engineer or his representative. Contractor shall notify the Engineer 24 hours prior to a concrete pour.
- K. Welded wire reinforcement in slabs is to be placed in the upper third of the depth of the slab. Lap 6" minimum. Reinforcement sheets shall be straightened as required before placement.
- L. Provide bent bars 6'-0" long of same size and spacing as horizontal bars for all corners of foundation walls, unless otherwise shown on the Plans.
- M. Do not displace or damage vapor barrier.
- N. For footing reinforcement - support bars on small precast concrete blocks; space at intervals as shown on the Plans and within minimum height specified above underside of slab or footing.
- O. Reinforcement shall not be bent after being partially embedded in hardened concrete.

3.02 CONCRETE PROTECTION FOR REINFORCEMENT:

- A. Unless otherwise shown or directed, concrete protection, measured from the surface of the bar, shall be the following:
 - 1. For concrete deposited against the ground, without the use of forms 3 inches
 - 2. For formed concrete in contact with the ground 2 inches
 - 3. For slabs and walls contacting water or sewage 2 inches
For beams, girders and columns not directly exposed to ground and weather 1-1/2 inches
 - 4. For formed concrete exposed to the weather 2 inches
 - 5. For slabs and walls, not directly exposed to ground, weather, water or sewage 1 inch
- B. Exposed reinforcing bars intended for bonding with future extensions shall be protected from corrosion by a covering of concrete or other approved material.

3.03 FIELD QUALITY CONTROL

- A. Field inspection will be performed under the provisions of Section 03 30 00.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for plain and reinforced Cast-In-Place Concrete work including accessory items of work herein described, as shown on the Plans, as specified, and/or directed.

1.02 REFERENCES

- A. Reference to standard specifications for the following organizations is intended to specify minimum standards for quality of materials and performance of workmanship, and for standard test methods.
 - 1. American Society for Testing and Materials (ASTM) Publications, Latest Edition.
 - 2. American Concrete Institute (ACI) Standards, Latest Edition.
 - 3. Standard Specifications - Construction and Materials, New York State Department of Transportation (NYSDOT), Latest Edition, including Addenda thereto.

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301 and ACI 302.
- B. Acquire cement and aggregate from same source for all work.
- C. Conform to ACI 305R when concreting during hot weather, except as herein modified.
- D. Conform to ACI 306R when concreting during cold weather, except as herein modified.

1.04 SUBMITTALS, SAMPLES AND TESTS

- A. Product Data: Provide data on joint devices, attachment accessories and admixtures.
- B. Concrete:
 - 1. Samples and tests of all materials to be incorporated in the concrete shall be submitted in ample time for testing before delivery. All materials are subject to inspection and testing by a commercial testing laboratory approved by the Engineer at the Owner's expense. All materials are subject to approval by the Engineer prior to their delivery to the site.
 - 2. The Contractor shall obtain from the manufacturer, prior to the actual delivery of the concrete, a statement giving the sources, specific gravities, and sieve analyses of the aggregates and the dry weights of cement and saturated-surface-dry weights of fine and coarse aggregate and quantities, type and name of admixture

(if any) and of water per cubic yard of concrete that will be used in the manufacture of each class of concrete to be provided. This data shall be sent to the Engineer for review and approval.

- a. Aggregates shall be tested for gradation, purity and accelerated soundness. Tests shall comply with ASTM C33, C136, ASTM C40, and ASTM C88. The source of the material shall not be changed without retesting.
- b. Cement shall have representative mill test reports on physical and chemical requirements. All cement stored at job site or at concrete supplier's place for over 60 days shall be tested for compliance with ASTM C150.
- c. Contractor shall submit concrete mix design to be reviewed by the Engineer.
- d. Tests of other materials may be required by the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials shown, specified or required to be incorporated in cast-in-place concrete shall be of finest quality, and shall be delivered, stored and handled so as to prevent damage. Damaged or inferior materials will be rejected. Approved brands or sources must be used, without change for the entire project. All materials shall be proportioned to produce a well graded mixture of high density and maximum workability.
- B. Portland Cement shall be a standard brand in compliance with ASTM C150 Type I. Only one brand shall be used for exposed work. Generally, Type I cement shall be used; however, Types II or III may be employed with the approval of the Engineer or if shown, or specified.
- C. Fine Aggregates shall be clean, sharp, natural sand, free from loam, clay, organic impurities or frozen materials and shall conform to ASTM C33 in all respects. Sand shall be tested for impurities in accordance with ASTM C40.
- D. Coarse Aggregates shall consist of strong, clean, crushed limestone or crushed gravel, free from harmful material and meeting all of the requirements of ASTM C33. Coarse aggregate shall also comply with New York State Department of Transportation Material Designation 703-02. Crushed limestone and crushed gravel shall meet the Physical Requirements (Testing) Designation 703-0201 and 703-0202, respectively.
- E. Water used in mixing concrete shall be clean and free from all acid, alkali or organic matter and shall be obtained from a public water supply unless specifically permitted otherwise by the Engineer.
- F. Ready Mix Concrete shall comply with ASTM Specification C94, this Specification, and used subject to the Engineer's approval.

- G. Admixtures, where shown or specified, shall be as follows:
1. Air entraining agent shall be "Daravair" or "Darex AEA" as manufactured by W.R. Grace Co., or Master Builder's "MBVR", or equal meeting the requirements of ASTM C260.
 2. Water reducing agent shall be Sika "Plastiment", Master Builder's "Pozzolith", W.R. Grace's "WRDA", or equal meeting the requirements of ASTM C494.
 3. High range water reducers or superplasticizers shall be Sika "Sikament-FF", W.R. Grace's "Daracem-100" or "WRDA-19", or equal meeting the requirements of ASTM C494.
- H. Bonding Agent, where shown or specified, shall be "Dural 104" bonding compound manufactured by Dural International Corporation, "Sikadur 32 Hi Mod" by Sika Corporation, or equal.
- I. Anchorage Items, where shown or specified, shall be as follows:
1. Inserts for fastening shelf angles shall be malleable iron adjustable wedge type, with bolt and washer, if required, as manufactured by Hohman & Barnard, Inc., Richmond Screw Anchor Co., Inc., or equal.
 2. Threaded inserts for fastening of soffits of concrete beams shall malleable iron, as manufactured by Hohman & Barnard, Inc., Richmond Screw Anchor Co., Inc., or equal.
 3. Ceiling hanger inserts shall be standard type wire as manufactured by Hohman & Barnard, Inc., Heckman Building Products, Inc., or equal.
 4. Masonry anchor slots shall be galvanized sheet metal, felt filled, as manufactured by Hohman & Barnard, Inc., Heckman Building Products, Inc., or equal.
 5. Flashing reglets shall be O'Keefe's Inc., PVC "Watertite Type P", or equal to size and shape shown.
- J. Flexible Sleeve, where shown or specified, shall be of resilient rubber with a flanged, serrated waterstop and shall be cast directly into the walls of the concrete structure as shown on the Contract Documents. Flexible sleeve shall conform to the following physical requirements:

PROPERTY	ASTM TEST REQUIREMENTS		
	METHOD	MIN.	MAX.
Tensile Strength, psi	D412	1500	-
Ultimate Elongation, percent	D412	450	-
Hardness, Type A durometer	D2240	45	55

1. Flexible sleeve must permit a minimum of 10 degrees deflection in all directions. Flexible sleeve shall be "Lockjoint Flexible Manhole Sleeve" as manufactured by Chardon Rubber Company, or equal.

- K. Forms shall be wood, metal, or other approved materials as follows:
1. Plywood shall be Commercial Standard Douglas Fir, moisture resistant, concrete form plywood, at least 5-ply 5/8" thick.
 2. Metal forms shall be as approved, and must produce surfaces equal to those specified for wood forms.
 3. Form oil shall be an approved non-staining mineral oil, such as "Duogaurd II" by W.R. Meadows, or equal.
 4. Form ties shall be of approved design, adjustable length and free of devices that will leave hole or depression larger than 7/8" diameter. When forms are removed no metal shall be left within 1" of finished surface.
- L. Waterstops, where shown or specified, shall be minimum 3/8-inch thick across their entire section, heavy duty, serrated type manufactured from virgin polyvinyl chloride compound, "Model RB6-38H" as manufactured by Vinylex Corporation, or equal. They shall have a tensile strength of minimum 1800 psi and an elongation of minimum 200%.
1. Waterstops shall be open bulb type, 6-inch wide unless otherwise shown or directed by the Engineer. The waterstops shall be supported during concrete placement to prevent dislodgement and to insure that the ends remain at right angles to the joint. Field joints shall be butt welded with an electric iron in accordance with the manufacturer's instructions.
 2. Sample of the waterstops to be used shall be submitted to the Engineer for approval.
- M. Premolded Joint Filler, where shown or specified, shall be premolded, resilient, non-extruding type, 1/2-inch thick unless shown otherwise, full depth of concrete section as manufactured by Celotex Corporation, "Fibre Expansion Joint Filler" by W.R. Meadows, or equal.
1. Sample of the premolded filler proposed to be used shall be submitted to the Engineer for approval.
- N. Joint Sealant, where shown or specified, shall be elastomeric polyurethane sealant material, black in unexposed locations, and grey in exposed locations, and have balanced properties of elongation recovery and tensile strength, and shall be Sonneborn "Sonolastic NP1", Sika "Sikaflex 1A", or equal.
- O. Protective Covering for concrete finish slabs, where shown or specified, shall be "Orange Label Sisalkraft", Polyethylene Film as manufactured by Fortifiber Corp., or equal.
- P. Non-Shrink Grout, where shown or specified, shall be premixed compound consisting of non-metallic aggregate, natural aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days; such as "Masterflow" as manufactured by Master Builders, "SikaGrout 212" as manufactured by Sika, or approved equal.
1. Non-Shrink grout shall be used under structural steel column baseplates and all equipment baseplates. All work shall be done in strict accordance with the manufacturer's recommendations. At the request of the Engineer, the manufacturer's representative shall be called to the job site for consultation regarding detailed use of the grout.

- Q. Grout for fillets, channels, or other non-structural applications shall consist of one (1) part cement (Portland Cement Type 2) and three (3) parts fine aggregate (sand) with sufficient mixing water for the intended application.
- R. Cementitious Coating Materials, where shown or specified, shall be "Thoroseal" with "Acryle 60" bonding agent, as manufactured by Thoro System Products, "Anchor Masonry Surfacers" as manufactured by Anti Hydro Waterproofing Company, or equal.
- S. Curing Compound shall be acrylic based "Kure-N-Seal" as manufactured by Sonneborn, acrylic based "CS-309", or water based "VOCOMP-20" as manufactured by W.R. Meadows, or equal.
- T. Vapor Retarder, where shown or specified, shall be "Moistop" as manufactured by Fortifiber Corp. Vapor Barrier shall be "Premoulded Membrane Vaporseal" as manufactured by W.R. Meadows, or equal.
- U. Perimeter Insulation, where shown or specified, shall be "Styrofoam Square Edge" as manufactured by the Dow Chemical Corporation, "Foamular 250" as manufactured by UC Industries, or equal.
- V. Penetrating Sealer, where shown or specified, shall be two components, 50% solids penetrating epoxy sealer. The penetrating sealer shall be fully compatible with the types of form oil, curing compound and joint sealant used.
1. Concrete surfaces to be treated must be dry, cured for a minimum of 21 days, free from surface accumulations of dust, dirt, oil, debris, concrete curing compounds, bond breakers, or other compounds which would prevent penetration and intimate contact between the concrete surface and the penetrating sealer. Concrete surfaces require preparation per manufacturer's directions prior to sealer installation.
 2. Penetrating sealer shall be "Spec-Seal" as manufactured by Conspec, Inc., or equal.
- W. Metal Slab Joints, where shown or specified, shall be keyed type, minimum 18 gauge, galvanized steel by Heckmann Building Products, or equal.
- X. Vapor Barrier: 10 mil 0.254 mm) thick clear polyethylene film type recommended for below grade application.

2.02 CONCRETE MIX DESIGN

- A. The Contractor shall submit concrete mix designs to be reviewed by the Engineer. The mix designs shall be confirmed by making and testing trial mixes for each class of concrete to be incorporated in the work. All testing shall be made by an approved testing laboratory at the expense of the Contractor. Mix designs shall conform to the ACI 301, except as may be modified in the Plans and/or Specifications.

- B. No job concrete shall be poured until the mix design for that concrete has been approved by the Engineer. Once the mix has been approved, it shall not be changed, except when requested by the Engineer, or if requested by the Contractor and approved by the Engineer.
- C. Ready-mixed concrete from an established company will be approved, if conforming to ASTM C94, and to this specification. All concrete shall be batched, mixed, delivered to the site, and shall conform to these requirements and be controlled in a manner to assure uniform concrete for the quality specified.
- D. Water/cement ratios of all mixes shall be determined from w/c curve plotted from tests of the cement and aggregates used on the job. If necessary to increase the water content of the mix due to field conditions, sufficient cement must be added to maintain the design water/cement ratio. Accelerating or retarding admixtures may be permitted by the Engineer if requested by the Contractor to compensate for adverse weather conditions.
1. The various classes of concrete shall be designated as follows:

MAXIMUM PERMISSIBLE WATER-CEMENT RATIOS FOR CONCRETE (WHEN STRENGTH DATA FROM TRIAL BATCHES OR FIELD EXPERIENCE ARE NOT AVAILABLE) Maximum permissible water-cement ratio					
CLASS	MIN. 28-DAY COMPRESSIV E STRENGTH IN PSI*	NON-AIR-ENTRAINED CONCRETE		AIR-ENTRAINED CONCRETE	
		ABSOLUT E RATIO BY WEIGHT	US GAL. PER 94-LB. BAG OF CEMENT	ABSOLUT E RATIO BY WEIGHT	US GAL. PER 94-LB. BAG OF CEMENT
A	5,000	**	**	**	**
B	4,000	0.44	5.0	0.35	4.0
C	3,000	0.58	6.6	0.46	5.2
D	2,500	0.67	7.6	0.54	6.1
E	2,000	0.71	8.0	-	-
*28-day strength. With most materials, water/cement ratios shown will provide average strengths greater than indicated in Section 5.4 of ACI 318R as being required. **For strength above 4,500 psi (non-air-entrained concrete) and 4,000 psi (air-entrained concrete) proportions shall be established by methods of Section 5.3 of ACI 318R.					

Unless otherwise specified, all concrete shall be Class "B", non-air-entrained except exposed concrete which shall be air-entrained. When foundation walls or grade beams are exposed to weather above grade, the entire wall shall be considered exposed concrete.

2. Maximum size aggregates shall be used as follows unless otherwise designated by the Engineer.

1-1/2"	general work
3/4"	thin sections; heavy reinforcing
3/4"	columns, beams and slabs
Over 1-1/2"	massive structures, with approval
3/8"	floor toppings

3. Slump - Maximum:

Reinforced concrete – general	4"
Reinforced concrete - thin walls, columns	5"
Non-reinforced concrete	3"
Pavements, including sidewalks	3"
Heavy mass concrete	3"

4. Air Content: Use an approved air entraining admixture. The entrained content shall be controlled between 4% - 6%. See Plans for concrete work requiring air entrainment.
 - a. For mixes containing coarse aggregate with a top size of 3/4" or smaller and for exposed concrete subject to frost and salt action, air contents shall be increased to the range of 5% - 7%.

5. Should the Contractor feel it advantageous to employ concrete additives to improve workmanship or facilitate his work, he shall obtain the approval of the Engineer prior to his use of additives.

6. Use of accelerating admixtures in cold weather will not relax cold weather placement requirements.

2.03 STORAGE OF MATERIALS

- A. Portland cement shall be stored in a weather-tight structure. No cement that has taken a warehouse set shall be used and any stored over sixty (60) days shall be rejected unless tested for soundness and setting time under ASTM C150. Such tests shall be at the Contractor's expense.

- B. Fine and coarse aggregates shall be kept separated and free from deleterious substances. All topsoil shall be removed from the storage area. Materials shall be stockpiled in layers to prevent segregation; however, re-mixing may be required if gradation is not maintained. Care shall be taken not to inter-mix materials in the area with the aggregates.

- C. Any materials that have deteriorated or become contaminated will be rejected for use in the concrete and must be promptly disposed of by the Contractor.

PART 3 - EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Before each pour, forms and reinforcing shall be inspected and approved by the Engineer. The Contractor shall give at least 24 hours' notice before such an inspection is required. No pour shall be started until the Engineer has given approval. No concreting may be done in the absence of the Engineer without written permission of the Engineer.
- B. Concrete Batch Ticket:
1. The Contractor shall require the manufacturer of the concrete to furnish to the Engineer with each batch of concrete before unloading at the site, a delivery ticket on which is printed, stamped, or written, information concerning said concrete as follows:
 - Name of ready-mix batch plant
 - Serial number of ticket
 - Date
 - Truck number
 - Name of purchaser
 - Specific designation of job (name and location)
 - Designation of the concrete by compressive strength
 - Amount of concrete in cubic yards
 - Time loaded or of first mixing of cement and aggregates
 - Reading of revolution counter at the first addition of water
 - Type and brand, and amount of cement
 - Type and brand, and amount of admixtures
 - Total water added by producer (and W/C ratio)
 - Water added at job site (upon approval of the Engineer)
 - Maximum size of aggregate
 - Weights of fine and coarse aggregate
 - Ingredients certified as being previously approved
 - Signature or initials of ready-mix representative
- C. Concrete Testing:
1. The Owner shall employ an approved commercial testing laboratory at its own expense to provide field sampling, testing and inspection of all concrete. Continuous inspection by the approved testing laboratory shall be provided during all concrete pours. The Contractor shall maintain a record set of plans at the site showing date and amount of each pour, test results and temperature. If any portion of the work shows low test results, the Engineer may require batch plant inspection, additional testing, load tests, cored samples, and/or replacement of the faulty work, etc., at the Contractor's expense.
 2. The Owner, through its approved testing laboratory, shall make all laboratory or field tests as required and shall furnish all necessary equipment. The Owner, through its approved testing laboratory, shall transport all test cylinders from the site to the laboratory.

3. Field concrete inspection: The Owner, through its approved testing laboratory, shall provide a competent field concrete inspector whose minimum duties shall be as follows:
 - a. Check each truck on arrival to make sure that the concrete is not retempered.
 - b. Make necessary slump tests for uniformity control.
 - c. Make air tests and yield tests as required.
 - d. Make any and all test cylinders as may be required in the Specifications.
 - e. Notify the Engineers and/or his representative if any test results vary from the specified limits.
4. Tests:
 - a. Concrete shall be tested by an approved testing laboratory as follows:
 - Standard 6" x 12" compression cylinders shall be in compliance with ASTM C39 in sets of four and shall be moist cured. Break 2 at 7 days, and 2 at 28 days. One set shall be made for approval of each mix design, one set for first pour of 50 cubic yards or less, and one set for each additional pour of 50 cubic yards. If less than 50 cubic yards are placed in one day, one set shall be made for each day's pour.
 - All test cylinders shall be cast, moist cured and broken under laboratory conditions in accordance with the ASTM C31 and ASTM C39. All four cylinders of a test shall be taken from the middle third of a single load. Each cylinder shall be properly labeled with an identifying mark, the mix proportions, air content, amount of water, slump, and the location in the structure where the concrete was placed. Test reports shall include all this information. Distribute copies of reports as requested by the Engineer. Should any results be questionable, the Engineer shall be notified immediately so that corrective measures can be taken. Any test cylinder which has broken and fails to meet requirements shall be preserved for inspection by the Engineer.

D. Records:

1. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.02 BATCHING AND MIXING

- A. All Batching and Mixing shall conform to the following and the ACI 304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".
- B. Aggregates and bulk cement shall be measured to within 1% by weight. Cement in standard sacks need not be weighed. Water shall be measured by volume or by weight to within 1/2%. Aggregate weights shall be corrected for moisture content. Admixtures shall be added through appropriate dispensing equipment to an accuracy of 3%.

- C. The complete plant assembly shall be approved by the Engineer and shall conform to the following requirements:
 - 1. Provide ready adjustment of aggregate weights for varying moisture contents.
 - 2. Provide means of accurately controlling and easily checking water-cement ratio.
 - 3. Provide accurate control of all materials with positive shut-off.
 - 4. Facilities shall be provided for prompt removal of excess materials in hoppers.
 - 5. Each specified size of aggregate shall be measured separately with a separate beam scale.
 - 6. Bulk cement shall be dropped through canvas drop chutes or telescopic flexible hose tremie.
- D. Concrete mixers or mixer trucks shall not be loaded to more than the rated capacity of the truck.
- E. All concrete shall be mixed not less than 60 revolutions in the drum of a modern power mixer, at the rated speed of rotation. Mix not less than an additional 30 revolutions after the addition of any further water to the mix.
- F. Do not add raw materials to the drum until all of the preceding batch has been discharged. For transit mixers, the wash water shall be discharged and not used as part of the mix water for the next batch.
- G. Transit-mixed concrete shall be transported to the job site unmixed and only after arrival at the job site shall mixing begin. All concrete shall be unloaded from the mixer within 45 minutes after completion of mixing. All concrete still remaining in the truck shall be rejected.
- H. The total time interval from the time the cement makes contact with the aggregate to the complete unloading from the mixer shall not exceed 90 minutes, unless such time is extended by the Engineer. The time may be reduced in hot weather or under unusual conditions, if unsatisfactory results are obtained.

3.03 FORMWORK

- A. The Contractor shall design and construct suitable and adequate formwork in conformance with ACI 347R. All shoring shall be properly braced to safely withstand all vertical, moving and lateral forces during the construction period. Responsibility for adequacy and safety rests with the Contractor. Materials shall be as stated in Paragraph 2.1.
- B. General requirements for all forms shall be as follows:
 - 1. Forms shall be constructed of wood, plywood, or steel.
 - a. All forms shall be set true to line, plumb, and properly braced so as to maintain the desired position and shape during and after pouring concrete. Forms shall be sufficiently tight to prevent leakage.

- b. All joints between sheets shall be backed up to assure that both sheets are in the same plane. Edges of abutting sheets shall be straight and true and shall be forced tightly together to minimize fins. Quality of form contact surfaces shall be subject to Engineer's approval.
- c. Form ties shall be designed for the specific wall thickness required, and after removal of the external portion, no metal shall remain closer than one inch (1") from the surface. Ties to be left in place shall be equipped with washers or other approved devices to prevent seepage of moisture along the tie. The removable portion shall be oil or grease coated.
- d. Immediately following the removal of forms, the projecting ties shall be removed and all holes filled with grout flush with the wall. Care shall be taken to use the same brand of cement and same mix proportions used in the wall to prevent color differences.
- e. Forms for walls and columns shall be provided with removable cleanout panels, to allow removal of chips and debris. All plywood forms must be new when first used on this job, but may be reused if kept in good condition. All forms shall be swept or flushed clean of shavings, debris, and other loose material. Loose earth and rock shall be scraped from footing trenches before pouring concrete.
- f. Provide 3/4" chamfer strips, unless noted otherwise on the drawings, at all exposed corners of columns, beams and walls where later finish is not to be applied.
- g. All forms and shores for floor and roof slabs and beams shall be "crowned" or "cambered" 1/4" for each 12 feet of span to eliminate dead load deflection. All forms shall be oiled with a non-staining mineral form oil before placing reinforcing.
- h. Build into forms all hangers, anchors, bolts, inserts, sleeves, etc., required to be set as part of this work, place and secure in exact position.

C. Form removal shall be as follows:

- 1. It shall be the Contractor's responsibility to determine the time at which forms may be removed without endangering the structure, subject to the following limitations, unless documentation is provided to modify these requirements:

Footing forms - 24 hours minimum; continue curing as specified.

Wall forms - 2 days minimum for ten (10) feet high. Add one (1) day for each additional five (5) feet of height; continue curing as specified.

Superstructure slabs, beams and columns shall not be stripped until the concrete attains at least 75% of its design strength as proven by test cylinders, and until a minimum of 14 days has elapsed.

Reshoring - immediately after stripping, fully reshore all slabs which are to be used to support shores for upper slabs. All forms for upper floor pours must be supported by shoring to at least two levels of full strength concrete.

3.04 JOINTS FOR CONCRETE

- A. Joints for concrete shall include all expansion joints, construction joints and contraction joints.
- B. All joints shall be constructed at locations shown on the drawings, or as directed by the Engineer. Additional joints may be constructed by the Contractor subject to the approval of the Engineer.
- C. Expansion Joints:
 - 1. Expansion joints shall be constructed where shown and as directed. Reinforcement, corner protection angles or other fixed items embedded or bonded into concrete shall not be run continuously through expansion joints. Reinforcement shall be discontinued 2 inches from the joint face. A slightly rounded edging shall be provided to finish neatly all edges around expansion joints.
 - 2. Preformed expansion joint filler material, sealant and waterstops, where shown on the drawings, shall be as specified in Paragraph 2.1.
- D. Construction Joints:
 - 1. The location of construction joints shall be chosen by the Contractor and shall be subject to the Engineer's approval except where specifically located on the Plans.
 - 2. Horizontal construction joints in walls will not be permitted, except with the approval of the Engineer. In order to minimize shrinkage, long continuous walls shall not be poured at one time. No more than 50 feet in horizontal direction shall be poured without a construction joint, unless prior approval is obtained from the Engineer.
 - 3. Reinforcing shall be discontinuous through a construction joint, unless otherwise noted on drawings. As shown or specified on the drawings, additional No. 3 reinforcing bars spaced at 12-inches on center shall be placed horizontally in each construction joint at the center of the section. These bars shall be 4-feet long and shall extend 2-feet on each side of the joint. Reinforcement projecting through joint shall be kept clean.
 - 4. As indicated on the drawings, all construction joints shall be provided with a keyway and a PVC waterstop as specified in Paragraph 2.1. The joint surface of the concrete previously placed shall be cleaned of all foreign matter and laitance by means of sandblasting with steam and sharp sand, or by other approved methods, until coarse aggregate is exposed. The concrete surface shall be saturated for a period of 6 hours and excess water then removed.
 - 5. The new concrete shall be preceded by about 1/2-inch of soft mortar of the same proportions as that in the concrete. When accessible, this shall be scrubbed into the surface of the joint with wire brooms. When waterproofing is required, the entire joint shall be parged with a grout of approved mixture as recommended by the manufacturer of the waterproofing admixture, or one composed of one part integral waterproofing, three parts water and sufficient Portland Cement to form a thick, creamy mixture. This grout shall be fresh when followed by the new concrete. In column forms and deep narrow forms, the concrete placement shall be started with an oversanded mix with 5/8-inch maximum aggregate, and extra

sack of cement per cubic yard, and a 5-inch slump. This mix shall be placed maximum 2 inches deep on the construction joint. A mortar layer shall not be used.

6. As indicated on drawings, a metal keyed floor slab joint may be used in lieu of above method.

E. Contraction (Control) Joints:

1. Contraction joints shall be located as shown on the drawings or as directed. Reinforcement through the joint shall be continuous as shown on the drawings and/or as directed by the Engineer.
2. Sawcut contraction joints (Type "A") shall be made by cutting the concrete surface and filling with the sealant material as specified under paragraph 2.1. Cutting shall be done after the surface is firm enough not to be damaged by the cutting blade. Time of cutting shall be approved by the Engineer.
3. Formed contraction joints (Type "B") shall be made by tooling with a 1/4-inch radius edging tool and filled with the sealant material as specified under paragraph 2.1.
4. Premolded Contraction Joints (Type AC@) shall be "Kold-Seal Zipper Strip" by Vinylex or "Zip Cap Control Joint" by Greenstreak Products, or equal.
5. As indicated on drawings, a metal keyed floor slab joint may be used in lieu of above method.

3.05 INSERTS AND SLEEVES

- A. The Contractor shall cooperate with all other Contractors in permitting the placing of all necessary sleeves, conduit, or inserts for hangers for their trades. The Contractor shall notify the trades of all pours in ample time for the responsible Contractor to place all embedded items, sleeves, slots, holes or chases.
- B. Accurately set all slots, chases, anchor bolts, opening, etc. All inserts for hanging mechanical equipment shall be provided and set by the Contractor for the trade involved. All sleeves for piping passing through floors and walls shall be provided by the Contractor for the trade involved and set by the General Contractor.
- C. All conduit which must be placed in concrete slabs shall be installed after, and above the bottom reinforcing, but before, and under the top reinforcing. Where conduit cross-overs are necessary, they shall be located so that reinforcing is not displaced from its specified position.
- D. All anchor bolts for the structural steel shall be carefully set as shown on the fabricator's approved anchor bolt plan.
- E. If, in the judgement of the Engineer, embedded items are located or grouped in a manner that will weaken the structure, the Contractor shall take the necessary corrective steps.

- F. All inserts and sleeves where the outside diameter is greater than the spacing between the reinforcing steel, the reinforcing bars shall be warped around such inserts and sleeves. Unless shown otherwise on the drawings, provide, as a minimum, two #4 diagonal bars per face at 90 degrees to each other all around the inserts and sleeves.
- G. Where openings are left in new concrete or are made in existing concrete for the insertion of wall castings, pipes or other fixtures, the space around these fixtures shall be made watertight by completely filling with a non-shrinking concrete containing an admixture of "SikaSet-C", "Anti-Hydro" Concrete Waterproofing Agent, or equal.

3.06 CONVEYING AND PLACING CONCRETE

- A. The placing or depositing of all concrete shall be done in accordance with ACI 304, and as modified herein.
- B. Preparation Prior to Placing Concrete:
 - 1. Prepare previously placed concrete surfaces by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
 - 2. In locations where new concrete is dowelled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
 - 3. Before placing concrete, all debris, water, snow and ice shall be removed from places to be occupied by concrete. Wood forms shall be wetted except in freezing weather or oiled, and the reinforcement cleaned of ice or other coatings.
- C. Conveying, transporting, and placing shall be done as rapidly as practicable and without segregation, loss of ingredients, and without unnecessary rehandling. The tempering of concrete will not be permitted.
- D. Concrete shall be deposited as nearly as practical to its final position to avoid segregation due to rehandling or flowing. The concreting shall be carried on at such a rate that the concrete is at all times plastic and workable and flows readily into the spaces between the reinforcing bars. No concrete that has partially hardened or been contaminated by foreign material shall be deposited on the work, nor shall retempered concrete be used. Once the concreting is started, it shall be carried on as a continuous operation until the placing of the panel or section is completed. All concrete shall be compacted by suitable means during the placing operation, and thoroughly worked around reinforcement and embedded fixtures and into corners of the forms. Tremies shall be used for deep forms, and concrete shall not be dropped more than 6'-0".
- E. Vibrating:
 - 1. During and immediately after depositing, all concrete shall be thoroughly compacted by vibrating the concrete internally with mechanical vibrating equipment. Care must be taken not to over-vibrate the concrete. Maintain spare vibrator(s) at the site for use in the event of breakdowns.
 - 2. Spade and work the coarse aggregate away from forms, and work concrete around reinforcement to avoid air pockets, voids, and honeycombed sections. Hand spading slabs will be required in addition to mechanical vibration.

- F. During concreting, check shoring frequently with level. Strengthen or adjust shoring as required. Ensure reinforcement, inserts, embedded parts and formed joints are not disturbed during concrete placement.
- G. Placing of concrete in supported elements shall not be started until the concrete previously placed in columns and walls is no longer plastic and has been in place at least two hours.
- H. Screed all work to level surfaces at the proper elevations. Rake surfaces to provide bond for floor finishes where specified.
- I. No concrete shall be deposited under water without written permission of the Engineer and then only in accordance with his directions. Proper tremie equipment and techniques must be used, should the need arise.
- J. The Contractor shall have available at all times, sufficient approved materials such that, when started, concrete shall be continuous operation until placement of panel or section is complete. Should placing of concrete be suspended or unavoidably interrupted once a pour has been started, provide bulkheads and keyways at formed surface at which to stop pour.
- K. All laitance shall be removed from previous pours before additional concrete is placed.
- L. Place concrete continuously between predetermined expansion, control and construction joints.

3.07 PROTECTION AND CURING

- A. All concrete shall be protected against injury by sun, rain, freezing, mechanical damage, or premature drying. All concrete shall be maintained above 50°F in a moist or wet condition for at least the first 7 days after placement.
- B. On vertical surfaces keep forms on, or cover with burlap blankets, kept wet. When forms are exposed to the sun, minimize moisture loss by keeping the forms wet until they can be removed safely.
 - 1. For the preservation of moisture, apply one of the following procedures to concrete not in contact with forms, immediately after completion of placement and finishing:
 - a. continuous sprinkling
 - b. application of absorptive mats or fabric kept continuously wet
 - c. application of waterproof sheet materials as specified in Part 2, herein
 - d. application of the curing agent specified in Part 2, herein
- C. On horizontal surfaces and floors to receive later finishes, cover with wet burlap, wet sand, or curing paper and keep saturated. Cement finish floors shall be covered with protective covering material with lapped and sealed edges after the concrete has set sufficiently to carry worker's weight. Covering shall remain in place until floor is cleaned. Weight covering with planks as required to hold it in place.

- D. Cold weather protection shall conform to A.C.I. 306R, except as modified herein.
1. Prior to pouring, it shall be the Contractor's responsibility to keep the forms free from snow, ice, mud or debris at all times, by means of covers, enclosures, live steam or heating below the forms, as necessary. Use of torches, open flames, salts, straw, hay or chemical is prohibited.
 2. When air temperature is 40°F, or less, use only heated concrete, delivered to the forms at temperatures between 65°F and 85°F. All portions of freshly poured concrete shall be continually maintained at a temperature of not less than 50°F for seven days. Specified temperature shall be maintained by heated enclosures, insulating blankets, insulated forms, or whatever approved methods are required to attain the specified result.
 3. Concrete shall not be poured on frozen soil. After pouring, protect against freezing and heaving of subgrade. Any frozen concrete will be rejected and removed at the Contractor's expense. Accelerating admixtures shall not be accepted in lieu of winter protection.
- E. Hot weather protection shall conform to ACI 305R, except as modified herein.
1. During warm dry weather special care and precautions should be taken to prevent premature setting which may cause shrinkage and surface checking. No concrete shall be placed at temperatures above 90°F without approval of the Engineer.
- F. No water (except curing spray) shall be allowed to come in contact with the concrete or masonry surface for a minimum of 24 hours. Should the rising water place a stress on the concrete, proper bracing shall be provided. Loading shall not occur without prior approval by the Engineer, and proper safety precautions shall be the responsibility of the Contractor.
- G. Curing compound may be used as specified in Paragraph 2.1 provided discoloration does not occur and application is in accordance with manufacturer's direction and is compatible with concrete finish.

3.08 FOOTINGS AND MATS

- A. Hand trim excavation to required levels.
- B. Where shown on the drawings provide concrete mud mat to the thickness indicated.
- C. Support reinforcing on bricks or precast blocks, or where mud mat is used, on chairs or bolsters, 3" clear of soil.
- D. Columns and wall dowels shall be positioned, supported and tied in place before concrete is poured. Footing bottoms shall be inspected and approved by the Engineer before placing mud mat or footings.

3.09 SUPPORTED SLABS ON FORMS

- A. Forms shall be built to required dimensions and camber as specified above. Reinforcing shall be located as shown on approved placing plans. Support bars at specified heights with bolsters, chairs, etc., so that reinforcing will not be moved from the specified position during placing of concrete.
- B. Refer to Article 3.5 for installation of conduits.

3.10 SLABS ON GROUND

- A. Subgrade and base to be prepared as specified in Contract Documents.
- B. Form depressed ribs under partitions as required by sloping gravel, or provide permanent side forms to retain gravel.
- C. Trench subgrade for electric conduit as detailed on Plans. All reinforcing shall be above electric conduit.
- D. Place slabs of thickness shown on Plans, vibrate, screed, float level, and finish as specified below.

3.11 CONCRETE FINISHES - FORMED SURFACES

- A. After the forms are removed, all concrete surfaces shall be inspected, and any poor joints, voids, stone pockets or other defective areas noted by the Engineer shall be repaired immediately at the Contractor's expense by cutting away the unsound area to a minimum depth of 1 inch, and refilling with mortar mixed using the same brand of cement as the original pour. Edges of the patch shall be square with the face, with feather-edging prohibited. Obtain approval of corrective action prior to repair.
- B. Care shall be taken to saturate the patched area and holes shall be filled in 1/2-inch layers with a delay for an initial set to take place before the succeeding layer is applied. If, in the opinion of the Engineer, improper consolidation is too extensive, or if the structure appears weakened by the voids, complete removal of the concrete in question may be required. Patches shall be kept moist for a minimum of three days.
- C. Rubbed finishes shall be as follows:
 - 1. Type A: Surfaces shall be rubbed until all marks are obliterated and a uniformly smooth finish is obtained.
 - 2. Type B: Surfaces shall be rubbed until they are uniformly smooth, but the complete obliteration of all marks is not required.
 - 3. Type C: All fins, burrs and projections shall be removed, any honey-comb or tie-holes shall be filled and patched.
- D. The type of finish to be used shall be as scheduled or as noted on the Plans. Where the type of finish is not shown or scheduled, exposed faces shall be given a Type B finish and unexposed faces shall be given Type C finish.

- E. Rubbing shall begin as soon as practicable after removal of forms and shall be expedited to completion as rapidly as practicable.
- F. Surfaces shall be rubbed with carborundum and water until all fins, bubbles, hollows and other defects are removed. Grout or mortar shall not be used in the rubbing process, and plastering of surfaces will not be permitted. Power tools shall be used for rubbing with hand work limited to inaccessible corners or very small areas.

3.12 FLOOR AND SLAB FINISHING

- A. Finished floors and slabs shall be level to within 1/8" of finish floor elevation in ten feet. If this variation occurs, it must not be abrupt, but must taper so that the 1/8" variation takes place in not under 4 feet. Areas with drains shall have the surfaces sloped uniformly and true to the effect that no surface ponding occurs. If required by the Engineer, replace, grind or furnish underlayment to correct the variation, at the Contractor's expense. All floors and slabs shall be cured and protected as specified.
- B. Troweled Finish: Provide a floated finish, followed by a power troweling and then a hand troweling thoroughly consolidating the surface. Provide a finished surface essentially free from trowel marks and uniform in texture and appearance.
 - 1. Where exposed concrete finish is specified, provide a steel troweled finish.
 - 2. Under quarry tile and ceramic tile screed to accurate lines and levels as required to receive these materials. Floors receiving tile are to be steel troweled finished and are indicated on the Plans.
- C. Float Finish: A float finish shall be applied to all exterior concrete and those areas not intended for occupancy, such as culvert inverts, bottoms of manholes and catch basins, pads, etc.
- D. Broom Finish: Provide a floated finish. While the surface is still plastic, provide a textured finish by drawing a fiber bustle broom uniformly over the surface in one direction only. Provide "medium" texturing unless noted otherwise on the Contract Drawings. Sidewalks, walkways, or exterior ramps shall be given a broom finish, perpendicular to traffic, sufficient to leave marks without appreciable disturbance of the surface.
- E. Dusting with dry cement or cement sand mixtures, to hasten drying, is prohibited. Dry time shall be controlled by controlling the water content and slump of the concrete when placed.

3.13 BONDING

- A. For the bonding of new and old concrete, such provisions shall be made by means of steps, dovetails, bonding agents as specified in Paragraph 2.1, or other devices as shown, or directed.

- B. When placing of concrete is suspended or unavoidably interrupted, all necessary grooves for bonding future work shall be made before the concrete has attained its initial set. When the work is resumed, concrete previously placed shall be roughened, cleaned of all foreign material and laitance by means of sandblasting with steam and sharp sand or other approved methods, until coarse aggregate is exposed, and thoroughly wetted and slushed with mortar containing the same proportion of cement and fine aggregate as used in the concrete to be placed. Follow manufacturer's preparation recommendations when using a bonding agent.

3.14 MISCELLANEOUS CONCRETE WORK

- A. Pour all sump pits, canopies, copings and provide all other miscellaneous concrete and cement work shown on the drawings. All such concrete shall be reinforced as shown. Provide all cement filled stair treads as detailed. Place bottoms and walls of pits and trenches monolithically or provide waterstops and keys.
- B. Concrete Walks: Provide 4 inches thick minimum. Provide contraction joints spaced every 5 linear feet, unless otherwise indicated. Cut contraction joints 3/4-inch deep with a jointing tool after the surface has been finished. Provide 1/2-inch thick transverse expansion joints at changes in direction, where sidewalk abuts curb, steps, rigid pavement, or other similar structures. Provide a transverse slope of 1/4-inch per foot, and limit variation in cross section to 1/4-inch in 5 feet unless otherwise indicated.
- C. Curbs and Gutters: Provide contraction joints spaced every 10 feet maximum, unless otherwise indicated. Cut contraction joints 3/4-inch deep with a jointing tool after the surface has been finished. Provide expansion joints 1/2-inch thick and spaced every 100 feet maximum, unless otherwise indicated. Provide a broom finish.
- D. Equipment Bases: Unless otherwise shown, all equipment shall be erected on bases of Class "B" concrete. Thickness shall be as noted on the Plans, but at no time shall it measure less than 1 inch.
- E. Concrete Stairs, Steps and Platforms: Stairs, steps and platforms shall be formed to required profiles shown on the Plans. Place reinforcing as required. Finish of stairs and steps shall be monolithic. Where shown on Plans, provide for nosings. Exterior stairs, steps and platforms shall have a non-slip finish. Before final troweling, embed abrasive grits, as specified in Paragraph 2.1, in the surface.

3.15 CEMENTITIOUS COATING

- A. Cementitious Coating shall be applied to all exposed exterior and interior Cast-In-Place Concrete surfaces except concrete floors and walking surfaces in accordance with the schedule shown on the Plans, or otherwise directed.
- B. The surfaces to be coated shall be clean, free of all laitance, dirt, grease, curing compound, form treatments, efflorescence, paint and other foreign matter. All formed tie-rod holes and honeycombed areas shall be patched flush with the surrounding area using mortar as recommended by cementitious coating manufacturer.

- C. All areas scheduled to be coated will receive two coats of cementitious coating as specified in Paragraph 2.1, applied at a minimum rate of 2 pounds per square yard per coat. The first coat shall be allowed to set before the second coat is applied. Sufficient materials shall be applied to fully seal all pores and voids. All coatings shall be done strictly in accordance with the manufacturer's recommendations.

END OF SECTION

SECTION 05 50 01

METAL FABRICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall provide all labor, materials and equipment required to fabricate and erect all Metal Fabrications, complete with anchorage devices, connections, accessories and incidental work, as shown on the Drawings, as specified, and/or directed.
- B. No attempt is made to enumerate or describe each item of miscellaneous metal work, but simply to describe major items, certain special items, and general construction requirements for all items.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. Aluminum Association, Inc. (AA) Publications:
 - a. SAA46 - Standards for Anodized Architectural Aluminum
 - b. DAF45 - Designation System for Aluminum Finishes
 - 2. American Institute of Steel Construction (AISC) Publications:
 - a. M011 - Manual of Steel Construction
 - b. S326 - Specifications for Structural Steel Buildings
 - 3. American National Standards Institute, Inc. (ANSI) Publications:
 - a. SNT-101 - Safety Requirements for Heavy Duty, Portable, Compressed Air Actuated Fastener Driving Tools
 - b. A14.3 - Safety Requirements for Fixed Ladders
 - c. B18.2.1 - Square and Hex Bolts and Screws Inch Series Including Hex Cap Screws and Lag Screws
 - d. B18.2.4 - Square and Hex Nuts
 - e. B18.5 - Round Head Bolts
 - f. B18.21.1 - Lock Washers
 - 4. American Society for Testing and Materials (ASTM) Publications:
 - a. A36 - Structural Steel
 - b. A48 - Gray Iron Castings
 - c. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
 - d. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 - e. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - f. A167 - Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet and Strip

- g. A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- h. A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
- i. A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements
- j. A687 - High Strength Non-Headed Steel Bolts and Studs
- k. A786 - Rolled Steel Floor Plates
- l. B26 - Aluminum-Alloy Sand Castings
- m. B108 - Aluminum-Alloy Permanent Mold Castings
- n. B209 - Aluminum and Aluminum Alloy Sheet and Plate
- o. B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes
- p. B429 - Aluminum-Alloy Extruded Structural Pipe and Tube
- 5. American Welding Society, Inc. (AWS) Publication:
 - a. D1.1 - Structural Welding Code, Steel
- 6. National Association of Architectural Metal Manufacturers (NAAMM) Publication:
 - a. MFM - Metal Finishes Manual
- 7. National Fire Protection Association (NFPA) Publication:
 - a. 101 - Code for Safety to Life from Fire in Buildings and Structures
- 8. Steel Structures Painting Council (SSPC) Publications:
 - a. SP 2 - Hand Tool Cleaning
 - b. SP 3 - Power Tool Cleaning
 - c. SP 6 - Commercial Blast Cleaning
 - d. Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer

1.03 SUBMITTALS: Submit the following.

- A. Manufacturer's Catalog Data:
 - 1. Guard posts (Bollards) and covers
- B. Shop Drawings:
 - 1. Guard posts (Bollards)
 - 2. Miscellaneous plates and shapes
- C. Certificates of Compliance: Attest that materials comply with requirements of this Specification and of referenced documents.
 - 1. Carbon steel
 - 2. Steel pipe and tubing
 - 3. Cast iron gratings
 - 4. Floor plate
 - 5. Shop primer
 - 6. Welding electrodes and rods

- D. Submit drawings for approval prior to fabrication. Include templates, and erection and installation details, indicating thickness, type, grade, class of metal, and dimensions. Show construction details, reinforcement, anchorage, and installation with relation to the building construction.

1.04 QUALIFICATION OF WELDERS

- A. In accordance with AWS D1.1 using procedures, materials, and equipment of the type required for the work.

1.05 DELIVERY AND STORAGE

- A. Protect from corrosion, deformation, and other types of damage. Store items in an enclosed area free from contact with soil and weather. Contractor shall replace and remove damaged items with new items.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Products shall conform to the respective reference specifications and standards and to the requirements specified herein.
- B. Steel and Iron: If not specified otherwise, use standard mill finished structural steel shapes or bar iron in compliance with AISC Specifications for Structural Steel Buildings.
- C. Structural Carbon Steel: ASTM A36.
- D. Structural Tubing: ASTM A500, Grade B or ASTM A501.
- E. Steel Pipe: ASTM A53, Type E or S, Grade B, standard weight unless otherwise specified.
- F. Fittings for Steel Pipe: Standard malleable iron fittings.
- G. Cast Iron Gratings: Gray cast iron conforming to ASTM A48, Class 40.
- H. Floor Plates: Steel plate where shown, shall conform to ASTM A786. Unless otherwise shown, steel plate shall be not less than 14 gauge.
- I. Anchors and Fasteners: Where exposed, shall be of the same material, color, and finish as the metal to which applied.
 - 1. Expansion Shields: Group, type, class, and style best suited for the purpose. Provide shields recessed not less than 2-1/2 inches into concrete or masonry, unless indicated otherwise.
 - 2. Lag Screws and Bolts: ANSI B18.2.1, type and grade best suited for the purpose.

3. Toggle Bolts: ANSI B18.2.1 and ANSI B18.5.
 4. Bolts, Nuts, Studs and Rivets: ANSI B18.2.4 and ASTM A687.
 5. Powder Driven Fasteners: Use when permitted by ANSI. Follow safety provisions of ANSI SNT-101.
 6. Lock Washers: Circular washers shall conform to ANSI B18.21.1. Beveled washers for American Standard beams and channels shall be square or rectangular, taper in thickness, and be smooth.
- J. Aluminum Alloy Products: Shall conform to ASTM B209 for sheet plate, ASTM B221 for extrusions and ASTM B26 or ASTM B108 for castings, as applicable. Provide aluminum extrusions at least 1/8-inch thick and aluminum plate or sheet at least 0.050-inch thick.

2.02 DISSIMILAR MATERIALS

- A. Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wood, or absorptive materials subject to wetting, protect the surfaces with a coat of bituminous paint, to prevent galvanic or corrosive action.

PART 3 - EXECUTION

3.01 FABRICATION

- A. By mechanics skilled in the trade and in accordance with the manufacturer's directions. Metal work shall be well formed to shape and size, with sharp lines, angles, and true curves. All work shall be fabricated to allow for expansion and contraction of materials. Provide welding and bracing of adequate strength and durability, with tight, flush joints, dressed smooth and clean.

3.02 MEASUREMENTS

- A. Before fabrication, provide necessary field measurements and verify all measurements. Wherever possible, field measurements shall be taken prior to fabrication. Do not delay job progress; allow for trimming where final dimensions cannot be established before fabrication. The Contractor is solely responsible for fit and shall make all corrections required to items fabricated off site at no additional cost to Owner.

3.03 METAL SURFACES

- A. Shall be clean and free from mill scale, flake rust and rust pitting; well formed and finished to shape and size, with sharp lines, angles, and smooth surfaces. Shearing and punching shall leave clean true lines and surfaces. Weld or rivet permanent connections. Welds and flush rivets shall be used and finished flush and smooth on surfaces that will be exposed after installation. Do not use screws

or bolts where they can be avoided; when used, heads shall be countersunk, screwed up tight and threads nicked to prevent loosening.

3.04 CONSTRUCTION

- A. Thickness of metal and details of assembly and supports shall give ample strength and stiffness for the minimum loads specified or indicated.

3.05 FASTENING

- A. Provide the necessary rabbets, lugs, and brackets so that the work can be assembled in a neat and substantial manner. Holes for bolts and screws shall be drilled. Joints exposed to the weather shall be formed to exclude water. Conceal fastenings where possible.

3.06 SHOP FABRICATION

- A. Fabrication and assembly shall be done in the shop to the greatest extent possible. Provide holes required for connection of other adjacent or adjoining work.

3.07 MISCELLANEOUS ITEMS: Provide as noted on drawing.

- A. Guard Posts (Bollards): Provide 8-inch galvanized standard weight steel pipe as specified in ASTM A53. Anchor posts in concrete as indicated and fill solidly with minimum 2500 psi concrete conforming to Section 033000, "Cast-in-Place Concrete". Provide a yellow HDPE bollard cover (post sleeve) with high impact strength and UV resistance.
- B. Insect Screen: Bronze or aluminum color, 18-by 18-mesh. Provide for vents where applicable.
- C. Miscellaneous Plates and Shapes: ASTM A36. Provide for items that do not form a part of the structural steel framework, such as lintels, sill angles, miscellaneous mountings and frames.
- D. Sleeves: Fit pipes passing through concrete or masonry construction with pipe sleeves. Extend each sleeve through its respective wall and cut flush with each surface. Provide sleeves at least one inch greater in diameter than the pipe passing through them. Caulk sleeve and pipe after the piping is installed and tested.

3.08 ANCHORAGE, FASTENINGS, AND CONNECTIONS

- A. Anchorage: Provide anchorage for fastening work securely in place. Set anchors in concrete as the work progresses and space not more than 2 feet on centers unless indicated otherwise. Sizes, kinds, and spacings of anchors not indicated or specified shall be as necessary for the purpose, as approved. Anchorage not otherwise specified or indicated includes slotted inserts, expansion shields, and

powder-driven fasteners, when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; through bolts, lag bolts, and screws for wood. Provide inserts of suitable and approved types where required for support or anchorage of equipment and finish construction. Inserts shall be gray or malleable iron castings or galvanized steel unless indicated or specified otherwise. Slotted inserts shall be of types required to engage with anchors. Except where specified otherwise, anchors and anchor bolts in exterior walls shall be zinc-coated, and all other anchors and anchor bolts shall be heavily coated with bituminous paint.

1. Fastenings: Do not use wood plugs in any material. Use nonferrous attachments for nonferrous metal. Make exposed fastenings of compatible materials, generally matching in color and finish, and harmonizing with the material to which fastenings are applied. Conceal fastenings where practicable. Drill and punch to produce clean true lines and surfaces. Countersink metal work to receive hardware.
2. Threaded Connections: Make threaded connections up tight so that threads are entirely concealed. Make bolted work up tight and nick the threads or bush the stem to prevent loosening.
3. Anchors and Connecting Members: Provide in concrete or masonry as the work progresses, to avoid unnecessary cutting and drilling. Cut, fit, and drill as necessary so all materials are properly set in place and to permit engaging work to be properly installed.
4. Design Connections: Where not shown or indicated, connection details shall be in accordance with AISC M011, and connections shall be provided using A-307 or A-325 steel bolts. Provide necessary holes for securing work to building. Use lock washers under nuts.
5. Built-In Work: Metal work built-in with concrete or masonry shall be formed for anchorage, or be provided with suitable anchoring devices as shown or as required. Furnish metal work in ample time for securing in place as the work progresses.

3.09 WELDING

- A. Perform welding, welding inspection, and corrective welding, in accordance with AWS D1.1. Weld in a manner to prevent permanent distortion of the connected parts. Weld continuously along the entire area of contact except where tack welding is permitted. Do not tack weld exposed connections. Grind smooth visible welds in the finished installation.

3.10 FINISHES

- A. Galvanizing: Hot-dip galvanize items specified to be zinc-coated, after fabrication where practicable. Galvanizing: ASTM A123, ASTM A153 and ASTM A525, as applicable.
 1. Galvanize: Anchor bolts, grating fasteners, washers, and parts or devices necessary for proper installation, unless indicated otherwise.

2. Repair of Zinc-Coated Surfaces: Repair surfaces damaged by welding or other means with galvanizing repair paint or by the application of stick or thick paste material specifically designed for repair of galvanizing, as approved. Clean areas to be repaired, and remove the slag from the welds. Surfaces to which stick or paste material is applied, shall be heated with a torch to a temperature sufficient to melt the metallics in stick or paste; spread the molten material uniformly over surfaces to be coated and wipe the excess material off.
- B. Shop Cleaning and Painting: After surface preparation, apply pretreatment and primer as specified. Do not coat surfaces of items to be embedded in concrete or to be welded. Recoat damaged surfaces using surface preparation, treatment, primer and paint that was applied to the adjacent surfaces upon completion of work. Do not apply bituminous protective coatings to items to be finish painted.
1. Environmental Conditions: Do not clean or paint surface when damp or exposed to foggy or rainy weather, when the metallic surfaces temperature is within 5 degrees F of the dew point of the surrounding air, or when the surface temperature is below 45 degrees F or over 95 degrees F, unless approved by the Engineer.
 2. Surface Preparation: Unless otherwise specified herein, abrasive blast clean exposed surfaces in accordance with SSPC SP 6. Surfaces that will be in spaces above ceiling, attic spaces, crawl spaces, furred spaces, and chases may be cleaned in accordance with SSPC SP 2 or SP 3 in lieu of being blast cleaned. Wash cleaned surfaces which become contaminated with rust, dirt, oil, grease, or other contaminants with solvents until thoroughly clean. Steel to be embedded in concrete shall be free of dirt and grease. Do not paint or galvanize bearing surfaces, including contact surfaces within slip-critical joints, but coat them with an approved rust preventive, applied in the shop. Remove such coating just prior to field erection using a remover approved by the rust preventive manufacturer. Surfaces, when assembled, shall be free of rust, grease, dirt and other foreign matter.
 3. Pretreatment, Priming and Painting: Apply pretreatment, primer, and paint in accordance with the manufacturer's standard practice. On surfaces concealed in the finished construction or not accessible for finish painting, apply an additional prime coat to a minimum dry film thickness of 0.1 mil. Tint the additional prime coat with a small amount of tinting pigment. Structural steel shall be shop primed with one coat SSPC Paint 25. Finish coat of paint is specified in Section 09 91 00, "Painting".
- C. Nonferrous Metal Surfaces: Protect by plating, anodic, organic, or other coatings as specified.
- D. Aluminum Surfaces:
1. Surface Condition: Before finishes are applied, exposed aluminum sheets, plates, and extrusions shall be free of roll marks, scratches, rolled-in scratches, kinks, stains, pits, orange peel, die marks, structural streaks, and

any other defects which will affect uniform appearance of finished surfaces.

2. Aluminum: Unexposed sheet, plate and extrusions may have mill finish as fabricated. Castings shall have sandblast finish, medium, equal to NAAMM MFM, Metal Finishes Manual, Designation AA-M43 or AA SAA46, Standards for Anodized Architectural Aluminum and AA DAF45 Designation System for Aluminum Finishes of The Aluminum Association Publications.

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Painting as shown on the Drawings, as specified and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. Code of Federal Regulations (CFR) Publications:
 - a. 29 1910.1000 - Occupational Safety and Health Standards
 - b. 29 1910.1025 - Occupational Safety and Health Standards (Lead)
 - 2. Federal Standard (FED-STD):
 - a. 313 - Material Safety Data Sheets Preparation and Submission of
 - 3. Steel Structures Painting Council (SSPC) Publications:
 - a. Paint-1 - Shop, Field, and Maintenance Painting
 - b. Paint-3 - A Guide to Safety in Paint Application
 - c. Paint-20 - Zinc-Rich Primers (Type I, Inorganic, and Type II Organic)
 - d. SP 1 - Solvent Cleaning
 - e. SP 2 - Hand Tool Cleaning
 - f. SP 3 - Power Tool Cleaning
 - g. SP 6 - Commercial Blast Cleaning
 - h. SP 7 - Brush-Off Blast Cleaning
 - i. SP 10 - Near-White Blast Cleaning
 - j. VIS1 - Pictorial Surface Preparation Standards for Painting Steel Surfaces, Guide to

1.03 SUBMITTALS

- A. Submit the following.
 - 1. Manufacturer's Instructions:
 - a. Paint application instructions
 - b. Manufacturer's material safety data sheets
 - 1) Submit Manufacturer's material safety data sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED-STD-313.

1.04 REGULATORY REQUIREMENTS

- A. Lead Content: Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.
- B. Chromate Content: Do not use coatings containing zinc-chromate or strontium-chromate.
- C. Asbestos Content: Materials shall not contain asbestos.

1.05 DELIVERY AND STORAGE

- A. Deliver materials in sealed, labeled containers bearing the manufacturer's name, brand designation, specification number, batch number, color, and date of manufacture. Restrict storage and mixing of materials to locations designated by the Engineer.

1.06 SAFETY METHODS

- A. Apply coating materials using safety methods and equipment in accordance with the following:
- B. Safety Methods Used During Coating Application: Comply with the requirements of SSPC Paint-3.
- C. Toxic Materials: To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:
 - 1. The chemical manufacturer when using mineral spirits, or other chemicals. Use impermeable gloves, chemical goggles or face shield, and other recommended protective clothing and equipment to avoid exposure of skin, eyes, and respiratory system. Conduct work in a manner to minimize exposure of building occupants and the general public.
 - 2. The appropriate OSHA standard in 29 CFR 1910.1025 for surface preparation on painted surfaces containing lead, zinc-chromate, strontium-chromate, asbestos, or other toxic ingredients.
 - 3. 29 CFR 1910.1000.
 - 4. Threshold Limit Values (R) of the American Conference of Governmental Industrial Hygienists.
 - 5. Manufacturer's Material Safety Data Sheets (MSDS).

1.07 ENVIRONMENTAL CONDITIONS

- A. Exterior Coatings: Do not apply coating to surfaces during foggy or rainy weather, or under the following surface temperature conditions:
 - 1. Less than 5 degrees F above the dew point;
 - 2. Below 40 degrees F (for oil-based paints), 50 degrees F (for latex paints), or over 95 degrees F, unless approved by the Engineer.

- B. Interior Coatings: Apply coatings when surfaces to be painted are dry and the following surface temperatures can be maintained:
1. Between 65 and 95 degrees F during the application of enamels and varnishes;
 2. Between 50 and 95 degrees F during the application of other coatings.

1.08 COLOR SELECTION

- A. Colors of finish coats shall be as indicated or specified. Where not indicated or specified, colors shall be selected by the Engineer.

1.09 LOCATION AND SURFACE TYPE TO BE PAINTED

- A. Painting Included: Where a space or surface is indicated to be painted, include the following unless indicated otherwise.
1. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.
 2. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.
 3. Existing coated surfaces that are damaged during performance of the work.
- B. Painting Excluded: Do not paint the following unless indicated otherwise.
1. Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.
 2. Surfaces in concealed spaces. Concealed spaces are defined as spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, and chases.
 3. Steel to be embedded in concrete.
 4. Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.
- C. Exterior Painting: Includes new surfaces, existing coated surfaces, and existing uncoated surfaces, of the building site work items and appurtenances. Also included are existing coated surfaces made bare by cleaning operations.
- D. Mechanical and Electrical Painting: Includes field coating of interior and exterior new and existing surfaces.
1. Where a space or surface is indicated to be painted, include the following items unless indicated otherwise.
 - a. Exposed piping, conduit, and ductwork;
 - b. Supports, hangers, air grilles, and registers;
 - c. Miscellaneous metal work and insulation coverings.
 2. Do not paint the following, unless indicated otherwise:
 - a. New zinc-coated, aluminum, and copper surfaces under insulation;
 - b. New aluminum jacket on piping; and

- c. New interior ferrous piping under insulation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS OF PAINT MATERIALS:

- A. Products shall comply with MPI standards indicated and shall be listed in the "MPI Approved Product List."

2.02 MATERIALS

- A. Provide as far as practical, pretreatments, primers and top coats from one coating manufacturer. Coatings shall be applied as a complete system and must be compatible with the substrate and each coating component. Coating systems shall be the manufacturer's industrial or commercial systems and are specified by generic type only. Residential coating systems shall not be permitted.
- B. See painting schedule at the end of this Section.
- C. Provide brands and qualities of materials for use on work exactly as specified, or an approved equal.
- D. Coordination: Provide finish coats which are compatible with prime paints used. Provide barrier coats over incompatible primers where required. Submit written notification of anticipated problems using specified coatings with substrates primed by others.
- E. Paint Colors:
 - 1. Provide colors as indicated or selected by Owner.
 - 2. Paint area of each color for observation, review and revisions before batch mixing of colors, or shipping large quantities of that color to job. Allow revisions to approved colors and textures after review of initial area of each color.
 - a. Vary top coats in shade from preceding coat without affecting finish color.
- F. Mixing and Tinting:
 - 1. Job mix or job tint only if approved. Mix only in pails in suitably sized non-ferrous or oxide-resistant metal pans.
 - 2. Strain to remove lumps and specks.
 - 3. Use tinting colors recommended by manufacturer for the specific type of finish.
 - 4. Add non-mercuric fungicidal agent to exterior finishes by manufacturer.

PART 3 - EXECUTION

3.01 PROTECTION OF AREAS AND SPACES

- A. Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

3.02 SURFACE PREPARATION

- A. Remove dirt, splinters, loose particles, grease, oil, disintegrated coatings, and other substances deleterious to coating performance as specified for each substrate.
- B. Existing Coating Surfaces With No Defects: Before application of coatings, perform the following on surfaces covered by soundly-adhered coatings, defined as those which cannot be removed with a putty knife:
 - 1. Wipe previously painted surfaces to receive solvent-based coatings, except stucco and similarly rough surfaces clean with a clean, dry cloth saturated with mineral spirits, FS TT-T-291. Allow surface to dry. Wiping shall immediately precede the application of the first coat of any coating, unless specified otherwise.
 - 2. Sand existing enamel and other glossy surfaces to remove gloss. Brush and wipe clean with a dry cloth.
 - 3. The requirements specified are minimum. Comply also with the instructions and recommendations of the paint manufacturer for preparation and application.
- C. Existing Coated Surfaces with Minor Defects: Sand, spackle, and treat minor defects to render them smooth. Minor defects are defined as scratches, nicks, cracks, gouges, spalls, alligatoring, chalking, and irregularities due to partial peeling of previous coatings.
- D. Removal of Existing Coatings: Remove existing coatings from the following surfaces:
 - 1. Surfaces containing large areas of minor defects;
 - 2. Surfaces containing more than 20 percent peeling area; and
 - 3. Surfaces designated by the Engineer, such as surfaces where rust shows through existing coatings.
- E. Substrate Repair:
 - 1. Repair substrate surface damaged during coating removal;

2. Sand edges of adjacent soundly-adhered existing coatings so they are tapered as smooth as practical to areas involved with coating removal; and
3. Clean and prime the substrate as specified.

3.03 PREPARATION OF METAL SURFACES

- A. Existing and New Ferrous Surfaces:
1. Shop-coated Surfaces and Small Areas That Contain Rust, Mill Scale and Other Foreign Substances: Solvent clean in accordance with SSPC SP 1 to remove oil and grease. Where shop coat is missing or damaged, clean according to SSPC SP 2 or SSPC SP 3.
 2. Surfaces With More Than 20 Percent Rust, Mill Scale, and Other Foreign Substances: Clean entire surface in accordance with SSPC SP 6.
 3. Galvanized steel shall be prepared for painting in accordance with ASTM D6386.
 4. Immersed Surfaces to Receive a Coating: Clean in accordance with SSPC SP 10.
- B. Final Ferrous Surface Condition: Cleaned surface shall be similar to photographs in SSPC VIS1 as follows:

DEGREE OF CLEANING	ADHERENT MILL SCALE	RUSTING MILL SCALE	RUSTED	PITTED AND RUSTED
Hand Tool Cleaning SSPC SP 2	(1)	B St 2	C St 2	D St 2
Power Tool Cleaning SSPC SP 3	(1)	B St 3	C St 3	D St 3
Commercial Blast Cleaning SSPC SP 6	(1)	(1)	C Sa 2	D Sa 2
Brush-Off Blast Cleaning SSPC SP 7	(1)	B Sa 1	C Sa 1	D Sa 1
Near White Blast Cleaning SSPC SP 10	A Sa 2-1/2	B Sa 2-1/2	C Sa 2-1/2	D Sa 2-1/2
Note: (1) No photograph is available or recommended for comparison.				

3.04 PREPARATION OF CONCRETE AND CEMENTITIOUS SURFACE

- A. Concrete and Masonry:
1. Surface Cleaning: Remove the following deleterious substances.
 - a. Dirt, Grease, and Oil: Wash new and existing uncoated surfaces with a solution composed of 3 ounces (2/3 cup) trisodium phosphate, 1 ounce (1/3 cup) household detergent, and 3 quarts of warm water. Then rinse thoroughly with fresh water. For large areas, water blasting may be used.

- b. Fungus and Mold: Wash existing uncoated surfaces with a solution composed of 3 ounces (2/3 cup) trisodium phosphate, 1 ounce (1/3 cup) household detergent, 1 quart 5 percent sodium hypochlorite solution and 3 quarts of warm water. Rinse thoroughly with fresh water.
- c. Glaze and Loose Particles: Remove by wire brushing.
- d. Efflorescence: Remove by scraping or wire brushing followed by washing with a 5- to 10-percent by weight aqueous solution of hydrochloric (muriatic) acid. Do not allow acid to remain on the surface for more than five minutes before rinsing with fresh water. Do not acid clean more than 4 square feet of surface, per workman, at one time.
- e. Removal of Existing Coatings: For surfaces to receive textured coating FS TT-C-555, remove existing coatings including soundly adhered coatings if recommended by textured coating manufacturer.
 - 1) Cosmetic Repair of Minor Defects: Repair or fill mortar joints and minor defects, including but not limited to spalls, in accordance with manufacturer's recommendations and prior to coating application.

3.05 APPLICATION

- A. Coating Application: Apply coating materials in accordance with SSPC Paint-1. SSPC Paint-1 methods are applicable to all substrates, except as modified herein. Thoroughly work coating materials into joints, crevices, and open spaces. Touch up damaged coatings before applying subsequent coats. Interior areas shall be broom clean and dust free before and during the application of coating material.
 - 1. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying. Provide each coat in specified condition to receive the next coat.
 - 2. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by the manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover the surface of the preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.
 - 3. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.
- B. Equipment: Apply coatings with approved brushes, approved rollers, or approved spray equipment, unless specified otherwise. Spray areas made inaccessible to brushing by items such as ducts and other equipment.

- C. Thinning of Paints: Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory for the type of paint being used. Obtain written permission from the Engineer to use thinners. The written permission shall include quantities and types of thinners to use.

D. Coating Systems:

1. Systems by Substrates: Apply coatings that conform to the respective specifications listed in the following Tables:

Table

I	Exterior Metal Surfaces
II	Exterior Concrete Surfaces
III	Exterior Masonry Surfaces

2. Minimum Dry Film Thickness (DFT): Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness.
3. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.
4. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:
- One coat of primer.
 - One coat of undercoat or intermediate coat.
 - One top coat to match adjacent surfaces.
5. Existing Coated Surfaces To Be Painted: Apply coatings conforming to the respective specifications listed in the Tables herein, except that pretreatments, sealers, fillers, and primers need not be provided on surfaces where existing coatings are soundly adhered and in good condition.

3.06 COATING SYSTEMS FOR METAL

- A. Primer: Apply specified ferrous metal primer on the same day that surface is cleaned. If flash rusting occurs, re-clean the surface prior to application of primer.
- Inaccessible Surfaces: Prior to erection, use two coats of the specified primer on metal surfaces that will be inaccessible after erection.
 - Shop-primed Surfaces: Touch up exposed substrates and damaged coatings to protect from rusting prior to applying field primer.
 - Pipes and Tubing: The semitransparent film applied to pipes and tubing at the mill is not to be considered a shop coat. Apply specified ferrous metal primer prior to application of subsequent coats.

4. Exposed Nails, Screws, Fasteners, and Miscellaneous Ferrous Surfaces:
On surfaces to be coated with water thinned coatings, spot prime exposed nails and other ferrous metal with latex primer.
 - a. Apply coatings of Tables I and II. "DFT" means dry film thickness in mils.

3.07 INSPECTION AND ACCEPTANCE

- A. In addition to meeting the previously specified requirements, demonstrate the mobility of moving components, including but not limited to swinging and sliding doors, cabinets, and windows with operable sash, for inspection by the Engineer. Perform this demonstration after appropriate curing and drying times of the coatings have elapsed and prior to invoicing for final payment.

TABLE I EXTERIOR METAL SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	SSPC SP 6	Epoxy-Polyamide	4.0	Aliphatic Polyester Polyurethane	1.5	-	-
Mild	SSPC SP 6	Alkyd-Phenolic Primer	2.0	Alkyd	1.5	Alkyd	1.5

TABLE II EXTERIOR CONCRETE SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	Clean and Dry	Modified Epoxy	8.0	-	-	-	-
Mild	Clean and Dry	Emulsified Acrylic	2.0	Emulsified Acrylic	2.0	-	-

TABLE III EXTERIOR MASONRY SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
All	Clean and Dry	Modified Epoxy	60 sf/gal	Modified Epoxy	8.0	-	-

END OF SECTION

SECTION 13 34 19

PRE-ENGINEERED METAL CANOPY

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The work includes the supply and installation of a freestanding, pre-engineered metal canopy structure integral with a concrete foundation system. Metal canopy structure shall include all steel framing, metal roof, roof drains and leaders, vertical fascia, and metal ceiling to provide weather protection for the fuel island. The Contractor shall furnish all materials, labor, equipment, tools, etc., required for the design, fabrication, transportation, and erection of the metal canopy system as specified herein.
- B. The manufacturer of the pre-engineered metal canopy shall be Austin Mohawk & Co. Inc. (2175 Beechgrove Place, Utica, NY 13501) (315) 793-3000, or approved equal.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced:
 - 1. American Concrete Institute (ACI) Publication:
 - ACI 318 Building Code Requirements for Reinforced Concrete
 - 2. American Institute of Steel Construction (AISC) Publications:
 - ASD Manual of Steel Construction: Allowable Stress Design
 - LRFD Manual of Steel Construction: Load Factor and
Resistance Factor Design, Seismic Provisions for
Structural Steel Buildings Detailing For Steel
Construction
 - 3. American Iron and Steel Institute (AISI) Publication:
 - Specification for Design of Cold-formed Steel Structural
Members
 - 4. American Society of Civil Engineers (ASCE) Publication:
 - ASCE 7 Minimum Design Loads for Buildings and Other
Structures
 - 5. American Society for Testing and Materials (ASTM) Publications:
 - A36/A36M Structural Steel
 - A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated,
Welded and Seamless

A108	Steel Bars, Carbon, Cold-Finished, Standard Quality
A123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
A242/A242M	High-Strength Low-Alloy Structural Steel
A307	Carbon Steel Externally Threaded Standard Fasteners
A449	Quenched and Tempered Steel Bolts and Studs
A500	Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
A501	Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
A514/A514M	High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding
ASTM A529/A529M	Structural Steel with 42 ksi Minimum Yield Point (1/2-Inch Maximum Thickness)
A563	Carbon and Alloy Steel Nuts
A568/A568M	General Requirements for Steel, Carbon and High Strength Low-Alloy Hot-Rolled Sheet and Cold-Rolled Sheet
A572/A572	High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality
A588/A588M	High-Strength Low-Alloy Structural Steel With 50 ksi (345 MPa) Minimum Yield Point to 4 in. (100 mm) Thick
A618	Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing
A668	Steel Forgings, Carbon and Alloy, for General Industrial Use
A780	Repair of Damaged Hot-Dip Galvanized Coatings
A992/A992M	High Strength Low-Alloy Structural Steel With 50 ksi (345 MPa) Minimum Yield Point
B695	Coatings of Zinc Mechanically Deposited on Iron and Steel
C827	Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures
F436	Hardened Steel Washers
F844	Washers, Steel, Plain (Flat), Unhardened for General Use
F959	Compressible-Washer-Type Direct Tension Indicators for Use With Structural Fasteners
F1554	Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
F3125	High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength

6. American Welding Society (AWS) Publications:

D1.1	Structural Welding Code - Steel
D1.3	Structural Welding Code - Sheet Steel
7. New York State Regulations:

Fire Code of New York State (FCBYS)
Building Code of New York State (BCNYS)
8. Geotechnical Evaluation Report prepared by Kenney Geotechnical Engineering Services, PLLC dated December 13, 2022.

1.03 RELATED SECTIONS

- A. Refer to Section 03 21 00, "Reinforcing Steel," and Section 03 30 00, "Cast-In-Place Concrete," that are an integral part of this Specification.

1.04 SUBMITTALS

- A. Comply with Section 01 33 00, Submittal Procedures.
- B. Shop Drawings:
 1. Shop Drawings and structural design calculations shall be signed and sealed by a Professional Engineer registered in the State of New York.
 2. Before starting work, submit completely detailed Shop Drawings showing dimensions, sizes, thickness, gauges, materials, finishes, connections, and erection procedure.
- C. Manufacturer's Data:
 1. Product Data: Include construction details, material descriptions, material specifications, dimensions of individual components and profiles, and finishes.
 2. Manufacturer's standard guarantee and manufacturer's experience requirements.
 3. Pre-engineered metal canopy, anchor rod, and foundation design shall be certified and sealed by a Professional Engineer registered in the State of New York, confirming that the pre-engineered structure is designed in accordance with all requirements of the current Building Code of New York State (BCNYS) and the Fire Code of New York State (FCNYS), and local code requirements. All materials shall non-combustible and the canopy shall be classified as Construction Type II and occupancy type U in accordance with BCNYS.
 4. Fabricator approval: Special Inspections during fabrication of the metal canopy are not required where the fabrication work is performed on the premises of a fabricator registered and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. Approval shall be obtained prior to commencing fabrication. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the Engineer and the Building Official stating that the work was performed in accordance with the approved Construction Documents.

5. Statement of Special Inspections (SSI) and Testing per BCNYS requirements.
 - a. Inspections required by the SSI will be provided by the Owner.
6. Color Samples: Submit color sample options for final color selection by Owner.
7. Warranty Data: Submit warranty documents for warrantee specified herein.

1.05 STRUCTURAL DESIGN

- A. Structural design of the complete pre-engineered metal canopy structure and foundations and shall be performed in accordance with the BCNYS, FCNYS, ASCE 7, Geotechnical Evaluation Report, and other referenced standards. The structural design includes the complete metal canopy structure (including the primary and secondary structural framing), anchor rods, and foundation system.
- B. Dimensions of Canopy:
 1. Footprint of Canopy: As indicated on the Contract Drawings.
 2. Height / Vertical Clearance: As indicated on the Contract Drawings.
- C. The pre-engineered metal canopy shall be designed for the following design loading parameters:
 1. Risk Category IV
 2. Dead Load: 10 psf plus structure self-weight.
 3. Live Load:
 - Roof Live Load, 20 psf
 4. Roof Snow Load Data:
 - Ground Snow Load, $p_g = 70$ psf
 - Snow Load Importance Factor, $I_s = 1.2$
 - Exposure Factor, $C_e = 1.0$
 - Thermal Factor, $C_t = 1.2$
 - Flat-Roof Snow Load, $p_f = 70.6$ psf
 - Design for unbalanced snow and/or drift loads in accordance with ASCE 7.
 5. Roof Rain Load Data:
 - 15-minute Rain Intensity, $i = 6.4$ inches/hour
 - 60-minute Rain Intensity, $i = 2.78$ inches/hour
 6. Wind Design Data:
 - Basic Design Wind Speed = 122 MPH
 - Exposure Class C
 7. Seismic Design Data:
 - Importance Factor, $I_E = 1.5$
 - Mapped Spectral Response Acceleration Parameters:
 - $S_s = 0.175g$
 - $S_1 = 0.057g$
 - Design Spectral Response Acceleration Parameters:
 - $S_{DS} = 0.151g$
 - $S_{D1} = 0.057g$
 - Site Class C
 - Seismic Design Category (SDC), A
 8. Geotechnical Design Data:
 - Design Vertical & Lateral Bearing Pressures, Refer to Geotechnical Evaluation Report
 - Design Frost Depth = 4 feet

1.06 PROJECT CONDITIONS

- A. Field Measurements: The Contractor shall verify location and elevation of footings relative to finished grade, columns, and other construction continuous with pre-engineered metal canopies by field measurements before fabrication and indicate measurements on shop drawings.

PART 2 – PRODUCTS

2.01 FOUNDATIONS

- A. Concrete foundations shall be designed in accordance with the current edition of ACI 318. Concrete materials shall be as specified under Section 03 30 00, “Cast-in-Place Concrete”. **Refer to the Geotechnical Evaluation Report for the project site.**
- B. Anchor rods shall be designed as part of the foundation system. Threads of the anchor rods shall project above the foundation to allow for double nuts and washers to be installed; one set shall be used for plumbing and leveling. Templates for setting anchor rods shall be provided (templates shall be removed prior to setting the pre-engineered metal canopy columns). Coordinate final anchor rod design and layout with the design foundation sections.

2.02 PRIMARY AND SECONDARY STRUCTURAL FRAMING

- A. All material and work shall conform to the latest AISC Specifications for Design, Fabrication, and Erection of Structural Steel for Buildings.
- B. Structural steel shapes shall conform to ASTM A572 Grade 50 or ASTM A992, $F_y = 50$ ksi. Other rolled sections shall conform to ASTM A36, $F_y = 36$ ksi.
- C. Square and rectangular tubing shall conform to ASTM A500, Grade B, $F_y = 46$ ksi.
- D. Steel plate Steel shall Conform to ASTM A36, $F_y = 36$ ksi.
- E. Base plates shall be a minimum 1-inch thick with fully welded gussets. Shop-fabricated with pre-punched or pre-drilled bolt holes. Top plates shall be a minimum $\frac{3}{4}$ -inch thick with fully welded gussets. Shop-fabricated with pre-punched or pre-drilled bolt holes.
- F. High-Strength Bolts, Nuts, and Washers:
 - 1. Heavy-hex Structural Bolts: ASTM F3125, Grade A325, Type 1 or Grade A490, Type 1.
 - 2. Heavy-hex Nuts: ASTM A563, Grade DH.
 - 3. Hardened Washers: ASTM F436, Type 1
- G. Anchor Rods shall be galvanized and shall conform to ASTM 1554 as headed (with a hex head) or unheaded with a welded nut (embedded). Anchor rods with a 90-degree bend legs will not be permitted.

- H. All structural steel shall be painted with one coat of drying rust inhibitive (red oxide) primer. Surface preparation, paint system and application shall be in accordance with Section 09 91 00, "Painting".
- I. Fabrication: Perform in shop as much as possible for bolted field assembly. Note on drawings all field cutting or drilling required. Steel shall be straight, true and within AISC tolerances. Make cold-formed sections by precision brake forming to produce dimensioned members, free of distortion. Surfaces shall be free of fins, burrs, deep gouges, and other irregularities; sharp edges shall be reduced by grinding to 1/8 inch radius; and welds shall be made smooth, uniform, and free of projections, undercuts, overlaps, inclusions, and other detrimental defects.
- H. Welding: Perform in accordance with AWS Code, by welders and welding operators who have been previously qualified for the type of welding involved. Perform welding preferably in flat position, by shielded or submerged electric arc methods only. Avoid welding members while incorporating slag or scale, and of full area required to develop joint strength.
- I. Bolting: High strength ASTM A325 or A490 type primary framing connections; low carbon steel ASTM A307 type for secondary framing connections. The facing surfaces of all bolted connections shall be smooth and free from burrs or distortions. High strength bolted connections shall conform to AISC Specification for Structural Joints.

2.03 ROOF/FASCIA

- A. Decking: 3-inch deep by 16-inch wide by 20-gauge steel panels, ASTM A653 Grade 40, $F_y = 40$ ksi, Grade 60 galvanized steel surface. Finished side shall be coated with a full coat of polyester paint baked on over an epoxy primer. A white wash coat applied over an epoxy primer shall be applied to the reverse side. Panels shall be manufactured in sufficient length to avoid unnecessary center gutters. No splicing of panels will be allowed.
- B. Metal Canopy Fascia:
 - 1. Aluminum Composite Panel (ACM): Available with a fluorocarbon paint finish, masked on one side. Shall be warranted for 10 or 20 years depending on color and finish.
 - 2. 2-inch Laminated Foam Core Fascia: Panel face is 24 gauge sheet steel hot-dipped galvanized in factory pre-assembled 10-foot lengths. Panel core material shall be 1-inch thick expanded virgin polystyrene in 1.25 PCF density. The backing sheet shall be 24-gauge G60 galvanized sheet metal. Panels shall have a finish side coated with a coat of polyester paint baked over an epoxy primer. A white polyester wash coat baked over an epoxy primer shall protect the reverse side of the panel. Exposed fasteners shall not be allowed on the bottom or exterior face. Support brackets shall be 20-gauge galvanized steel.

2.04 DRAINAGE SYSTEM

- A. Perimeter Gutters: Straight sections shall be ASTM A653 Grade 40, $F_y=40$ ksi with a G60 galvanized steel surface. Straight sections are 8 inches wide by 3 inches deep, 20-gauge steel. Straight gutter sections shall have a finish side coated with a full coat of polyester paint baked over an epoxy primer. Interior surface shall be protected by a white wash coat baked over an epoxy primer. Concealed perimeter system to match roof/ceiling deck.
- B. Center and Tapered Gutter: 24-gauge hot-dipped galvanized steel shall have a finish side coated with a full coat of polyester paint baked over an epoxy primer. Interior surface shall be protected by a white wash coat baked over an epoxy primer.
- C. External downspouts: 24-gauge hot-dipped galvanized steel shall have a finish side coated with a full coat of polyester paint baked over an epoxy primer. Interior surface shall be protected by a white wash coat baked over an epoxy primer; sized for roof drainage areas served.

2.05 FINISHES

- A. Comply with National Association of Architectural Metal Manufacturers (NAAMM) "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Surface preparation, intermediate coat system, finish coat paint system and application shall be in accordance with Section 09 91 00, "Painting".
- D. Final finish colors to be approved by Owner.

2.06 LIGHTING

- A. Provide pre-engineered metal canopy with lighting package suitable for use in gasoline and diesel fuel dispensing operations. Canopy lighting should be LED Ambient Canopy Lights as recommended by the manufacturer.

2.07 METAL CANOPY DRAINAGE PIPE

- A. Contractor shall install an underground drainage pipe as shown on Contract Drawings to provide drainage of collected precipitation from the metal canopy downspouts. Drain pipe shall be Sch. 80 PVC and shall be sized to handle maximum predicted flow in accordance with pre-engineered metal canopy manufacturer's recommendations.

PART 3 - EXECUTION

3.01 FOUNDATIONS

- A. Construction shall be in accordance with Section 03 30 00, "Cast-in-Place Concrete" **and as recommended in the Geotechnical Report.**

3.02 ERECTION

- A. Erect in accordance with the manufacturer's approved erection instructions and diagrams, except as specified otherwise. Correct defects and errors in the fabrication of building components in a manner approved by the Engineer. If defects or errors in fabrication of components cannot be corrected, remove and provide non-defective components. Plumb, guy, and stay columns and frames in both directions, and accurately space framing elements to ensure proper fit of prefabricated roof panels. When installing roof systems, install closure strips, flashing, sealing material, and other accessories in a manner approved by the Engineer so that the systems are weather-tight, free of abrasions, loose fasteners, and deformations. After erection is complete, repair and coat abraded and damaged, primed or factory-finished surfaces to match adjacent surfaces.

3.03 WARRANTY

- A. Pre-engineered metal canopy installation and equipment shall be free of defects in materials, leaks, and workmanship and shall be warranted by Contractor for a period of not less than 1 year from date of acceptance. Manufacturer shall provide 20-year limited warranty against peeling, flaking, and chipping of metal canopy deck.

END OF SECTION

SECTION 23 05 00

MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Mechanical General Requirements, as shown on the Drawings, as specified and/or directed.
- B. Related work specified elsewhere:
 - 1. Division 23, "Mechanical"
 - 2. Division 26, "Electrical"

1.02 REFERENCE STANDARDS

- A. The following is a list of standards that may be referenced in this section:
 - 1. Code of Federal Regulations (CFR) Publications:
 - a. 29-1910 SUBPART O - Machinery and Machine Guarding
 - b. 29-1910.219 - Mechanical Power Transmission Apparatus

1.03 SUBMITTALS

- A. Submit shop drawings, manufacturer's data, publication compliance, certified test reports, and manufacturer's certificates of compliance for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and have them approved before procurement, fabrication or delivery of the items to the job site. Shop drawings shall be accompanied by a letter of transmittal in duplicate, and all shop drawings shall be suitably identified with the name of the project, contract number, Contractor's name, date and initials indicating approval of such submittal by the Contractor under the applicable specification. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and the specific technical paragraph reference which specifies each item, applicable industry and technical society publication references, and other information necessary to establish contract compliance of each item to be furnished.
 - 1. Manufacturer's Data: Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.
 - 2. Shop Drawings: Drawings shall be a minimum of 8.5 inches by 11 inches in size, except as specified otherwise. Drawings shall include floor plans, sectional views, wiring diagrams, and installation details of equipment;

and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals, and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.

3. Manufacturer's Certificates of Compliance: Submit certification from manufacturer attesting that materials and equipment to be furnished for this project comply with the requirements of this specification and of the reference publications. Pre-printed certifications will not be acceptable; certifications shall be the manufacturer's original; certifications shall be not more than one year old. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; "equal or exceed the service and performance of the specified material". The certification shall simply state that the product conforms to the requirements specified. Certificates shall be signed by the manufacturer's official authorized to sign certificates of compliance.
4. Reference Standards Compliance: Where equipment or materials are specified to conform to industry and technical society reference standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), American Society of Mechanical Engineers (ASME), American Gas Association (AGA), American Refrigeration Institute (ARI), and Underwriters' Laboratories (UL), proof of such conformance shall be submitted. If an organization uses a label or listing to indicate compliance with a particular reference standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections.

- B. Independent Testing Organization Certificate: In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing and approved by the Engineer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

1.04 OPERATION AND MAINTENANCE MANUAL

- A. Furnish an operation and maintenance manual for each item of equipment. Furnish three copies of the manual bound in hardback binders or an approved equivalent. Furnish one complete manual to the Owner's Representative for review and approval not more than 90 calendar days after an item is approved, but at least 60 calendar days prior to field acceptance testing of the item. Furnish the remaining manuals at least 60 days prior to contract completion. Inscribe the

following identification on the cover: the words "OPERATION AND MAINTENANCE MANUAL", the name and location of the equipment or the building, the name of the Contractor, and the contract number. The manual shall include the names, addresses, and telephone numbers of each subcontractor installing equipment, and of the local representatives for each item of equipment. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include: wiring and control diagrams with data to explain detailed operation and control of each item of equipment; a control sequence describing start up, operation and shut down; description of the function of each principal item of equipment; the procedure for starting; the procedure for operating; shut down instructions; installation instructions; maintenance instructions; lubrication schedule including type, grade, temperature range, and frequency; safety precautions, diagrams, and illustrations; test procedures; performance data; and parts list. The parts lists for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the project site. The manual shall be complete in all respects for equipment, controls, accessories, and associated appurtenances provided.

1.05 CATALOGED PRODUCTS

- A. Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest design that complies with the specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number and serial number on the nameplate securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.06 MANUFACTURER'S RECOMMENDATIONS

- A. Unless otherwise stated in the Contract Specifications, all new equipment items, and specialties shall be installed in strict accordance with the recommendations of the manufacturer of the items being installed. Prior to the installation of new items, the Contractor shall submit to the Owner's representative printed copies of the manufacturer's installation recommendations. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material. Failure to install items in accordance with manufacturer's recommendations can be cause for rejection of the work items installed.

1.07 LAYOUT OF THE WORK

- A. Coordinate the proper relation of the work to the building structure, existing utilities and to the work of all trades. The Contractor shall advise the Owner's Representative of any discrepancy before performing any work.
 - 1. Contract Drawings: The Contract Drawings represent the general intent as to piping and equipment arrangements. All locations and dimensions shown shall be field verified and minor alterations made if so required. Where dimensions are not given for the location and arrangement of mechanical systems, locations may be assumed to be approximate, and may be altered if required. Major modifications to the indicated arrangements shall be approved by the Owner's Representative prior to the installation of mechanical systems. Schematic diagrams represent the overall system requirements and do not necessarily indicate the physical orientation, location or dimensions of that system.
 - 2. Record Drawings: The Contractor shall maintain a record of the progress of the work and shall submit three (3) sets of As-Built Drawings upon completion of the project.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Properly store, adequately protect, and carefully handle equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations, and as approved by the Engineer. Replace damaged or defective items.

1.09 SAFETY REQUIREMENTS

- A. Equipment Safety: Fully enclose or properly guard in accordance with 29 CFR 1910.219 belts, pulleys, chains, gears, couplings, projecting setscrews, keys, rotating parts, and other power transmission apparatus, located where persons can come in close proximity thereto. Points of operation, ingoing nip points, and machinery producing flying chips and sparks shall be guarded in accordance with the applicable portions of 29 CFR 1910 SUBPART O. Provide positive means of locking out equipment so that equipment cannot be accidentally started during maintenance procedures. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of the type specified. Provide catwalks, maintenance platforms, and guardrails where required for safe operation and maintenance of equipment. Provide ladders or stairways to reach catwalks and maintenance platforms. Ensure that access openings leading to equipment are large enough to carry through routine maintenance items such as filters and tools.
- B. Warning Sign: Provide a permanent placard or sign at the entrance to confined spaces contained in the equipment. The sign shall warn personnel not to enter the space until the atmosphere inside has been tested and systems have been de-energized.

1.10 ELECTRICAL REQUIREMENTS

- A. Furnish motors, controllers, disconnects and contactors with their respective pieces of equipment. Motors, controllers, disconnects and contactors shall conform to and have electrical connections provided under Division 26-Electrical. Furnish internal wiring for components of packaged equipment as an integral part of the equipment. Extended voltage range motors will not be permitted. Controllers and contactors shall have a maximum of 120 volt control circuits, and shall have auxiliary contacts for use with the controls furnished. When motors and equipment furnished are larger than sizes indicated, the cost of additional electrical service and related work shall be included under this Section. Power wiring and conduit for field installed equipment shall be provided under and conform to the requirements of Division 26 – Electrical. Unless specifically noted otherwise, all control wiring (120 volt or less) shall be provided by Mechanical Contractor and conform to the requirements of Division 26-Electrical.

1.11 INSTRUCTION TO OWNER'S PERSONNEL

- A. When specified in other sections, furnish the services of competent instructors to give full instruction to the designated Owner's personnel in the adjustment, operation, and maintenance, including pertinent safety requirements, of the specified equipment or system. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation. The number of days (8 hours per day) of instruction furnished shall be as specified in the individual section. When more than 4 days of instruction are specified, use approximately half of the time for classroom instruction. Use other time for instruction with the equipment or system. When significant changes or modifications in the equipment or system are made under the terms of the Contract, provide additional instruction to acquaint the operating personnel with the changes or modifications.

1.12 INSPECTIONS AND CERTIFICATIONS

- A. The Contractor shall provide and pay for any third party inspections or certifications required by applicable regulatory agencies for boilers and other mechanical equipment components modified, or furnished and installed as a part of the Contract work.

1.13 SPECIAL CONDITIONS

- A. The Contractor shall be performing work within active work areas and shall be responsible to coordinate with the Owner regarding planned interruptions to mechanical and electrical services.
 - 1. Protection of Existing Work: The Contractor shall take all necessary precautions to insure against damage to existing work to remain in place,

or to be reused. The Contractor shall insure that structural elements are not overloaded and additional structural supports required as a result of any cutting, removal or demolition work performed under any part of this Contract are added. The Contractor shall minimize disruption of existing non-contract work areas as much as possible.

2. Upon damage to existing equipment, buildings and/or structures, the Contractor shall immediately notify the Owner. All damages shall be repaired by the Contractor, or shall be replaced if beyond repair to match the existing to the Owner's satisfaction.
3. Protection of Buildings from the Weather: The interior of the buildings and all materials and equipment shall be protected from the weather at all times.
4. Protection of Personnel: Where the safety of non-contractor personnel is endangered in the area of the work, barricades shall be used. Additional protection shall be provided, if required, to preserve the safety of non-contractor personnel in the immediate area of the work.

1.14 POSTED OPERATING INSTRUCTIONS

- A. Provide for each system and principal item of equipment as specified in the technical sections for the use of the operation and maintenance personnel. The operating instructions shall include the following:
 1. System Descriptive Information: Wiring diagrams, control diagrams, piping diagrams, control sequence and operating points for each principal system and item of equipment. Post instructions where directed.
 2. Equipment Instructions: Attach to or post adjacent to each principal item of equipment and include directions.
 - a. Start up, proper adjustment, operating, lubrication, and shutdown procedures.
 - b. Safety precautions, procedure in the event of equipment failure.
 - c. Other areas as recommended by the manufacturer of each system or item of equipment.
 3. Print or engrave, and frame under glass or in approved laminated plastic. Operating instructions exposed to the weather shall be made of weatherproof materials or enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 FIELD PAINTING

- A. Conform to Section 09 91 00 – Painting

END OF SECTION

SECTION 23 11 13

FUEL PIPING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials, and equipment for Fuel Piping, as shown on the Drawings, as specified and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1. American National Standards Institute, Inc./American Society of Mechanical Engineers (ANSI/ASME) Publications:

A13.1	Scheme for the Identification of Piping Systems
B1.1	Unified Inch Screw Threads
B1.20.1	Pipe Threads, General Purpose, Inch
B16.3	Malleable Iron Threaded Fittings Classes 150 and 300
B16.5	Pipe Flanges and Flanged Fittings
B16.9	Factory-Made Wrought Buttwelding Fittings
B16.11	Forged Fittings, Socket-Welding and Threaded
B16.39	Malleable Iron Threaded Pipe Unions Classes 150, 250, and 300
B18.2.1	Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series)
B18.2.2	Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)
B31.8	Gas Transmission and Distribution Piping Systems
B31.9	Building Services Piping

2. American Society for Testing and Materials (ASTM) Publications:

A53	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
A126	Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
A181	Standard Specification for Carbon Steel Forgings, for General-Purpose Piping
A193	Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications

A194	Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
A234	Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
A307	Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength
3. Code of Federal Regulations (CFR) Publications:

49 CFR Part 192	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards
49 CFR Part 195	Transportation of Hazardous Liquids by Pipeline
 4. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) Publications:

SP 58	Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation
SP 83	Class 3000 and 6000 Pipe Unions, Socket Welding and Threaded (Carbon Steel, Alloy Steel, Stainless Steels, and Nickel Alloys)
 5. Military Standard (MIL-STD):

101	Color Code for Pipelines and for Compressed Gas Cylinders
 6. National Fire Protection Association (NFPA) Publications:

30	Flammable and Combustible Liquids Code
30A	Code for Motor Fuel Dispensing and Repair Garages
 7. New York State Fire & Building Code:

Mechanical Code of New York State
Fire Code of New York State
 8. Underwriters Laboratory (UL)

971	Non-metallic Underground Piping for Flammable Liquids
 9. New York State Codes, Rules and Regulations (NYCRR)

6 NYCRR Part 613	Petroleum Bulk Storage

10. United States Environmental Protection Agency

40 CFR Part 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
40 CFR Part 281	Approved Underground Storage Tank Programs

1.03 RELATED REQUIREMENTS

- A. Section 230100, "Mechanical General Requirements", applies to this Section, with additions and modifications specified herein.

1.04 SUBMITTALS

- A. Comply with Section 01 33 00, Submittal Procedures.

- B. Manufacturer's Catalog Data:
1. Pipe and fittings
 2. Hangers and supports
 3. Equipment connectors
 4. Valves
 5. Warning tape
 6. Risers
 7. Transition fittings
 8. Secondary containment piping
 9. Leak detection equipment and system
 10. Dispenser sumps
 11. Tank top sumps

- C. Statements:
1. Double containment pipe installer certification
 2. Sump installer certification

- D. Installation Documentation:
1. Completed Warranty Certification Card
 2. Pressure Test Report
 3. Leak Test Report (Underground Sumps)

1.05 QUALITY ASSURANCE

- A. Underground Sump and Piping Installer Certification: The sump and piping installers shall be trained and certified in the installation of underground sumps and piping as recommended and/or required by the sump manufacturer and piping manufacturer. A copy of the hot work permit shall be submitted to the Engineer prior to performing any hot work.
- B. Safety Standards: 49 CFR Part 192 and 49 CFR Part 195.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Handle, transport, and store equipment, pipe, and fittings carefully as directed by manufacturer. Plug or cap pipe ends during transportation or storage to minimize dirt and moisture entry. Do not subject to abrasion or concentrated external loads. Discard pipe sections and fittings that have been damaged.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials, equipment, and devices shall, as a minimum, meet all applicable requirements of UL, NFPA, NYSDEC, and the New York Fire and Mechanical Codes.

2.02 PIPE AND FITTINGS

- A. Aboveground Fuel Supply (Within Dispensers):
 - 1. Pipe: Black steel in accordance with ASTM A53, Schedule 40, plain end beveled butt welded.
 - 2. Socket-Welding Fittings: ANSI/ASME B16.11, forged steel.
 - 3. Butt Welding Fittings: ANSI/ASME B16.9, with backing rings of compatible material.
 - 4. Unions: ANSI/ASME B16.39, black malleable iron.
- B. Aboveground Tank Vent: Provide vent piping as follows:
 - 1. Pipe: Galvanized steel in accordance with ASTM A53, Schedule 40, threaded, flanged, or welded ends for sizes 2 inches and smaller; otherwise, plain end beveled butt welded or flanged connections.
 - 2. Threaded Fittings: ANSI/ASME B16.3, galvanized malleable iron.
 - 3. Socket-Welding Fittings: ANSI/ASME B16.11, forged steel.
 - 4. Butt Welding Fittings: ANSI/ASME B16.9, with backing rings of compatible material.
 - 5. Unions: ANSI/ASME B16.9, galvanized malleable iron.
 - 6. Flanges and Flanged Fittings: ANSI/ASME B16.5 steel flanges or convoluted steel flanges conforming to ASME BPVSEC8. Flange faces shall have integral grooves of rectangular cross sections which afford containment for self-energizing gasket material.
- C. Underground Tank Vent: Provide vent piping as follows:
 - 1. Underground Vent Pipe: Underground tank vent pipe shall be 3" UL 971-listed fiberglass reinforced plastic (FRP) underground pipe and sloped from the vent to the tank connection as indicated on the Drawings. Tank vent shall transition to galvanized steel above grade.
- D. Underground Supply Piping: Provide secondary containment piping system with leak detection and as follows:

1. Underground Containment Piping System: Provide UL 971-listed fiberglass reinforced plastic (FRP) secondary containment fuel piping system installed within a dual layer access pipe. Both the primary and secondary pipes shall be UL 971-listed. All underground containment piping shall be UL-listed for use with gasoline and diesel fuel. Manufacturer shall be as by National Oilwell Varco (NOV) (Dualoy® 3000/LCX coaxial pipe), or equal.
2. All fittings, entry boots, transitions, terminations, etc. for the underground containment piping systems shall be manufactured by the pipe manufacturer and used for the intended purpose.
 - a. Underground piping sump connections shall be made with pass through style fittings. Manufacturer shall be as by NOV (pass through style for Dualoy® 3000/LCX coaxial pipe), or equal.
3. Tank Top Sump: Provide double-wall, brine-filled interstice, fiberglass tank top sump, minimum 42 inches in diameter and attached to the underground storage tank with applicable fuel product and watertight seal to prevent water intrusion. Sump shall provide access to the underground storage piping and tank monitoring system sensor. Underground tank top sump shall be molded polygon fiberglass sumps with a snap-lock lid with vertical O-ring seal. Manufacturer shall be Containment Solutions (CSI), or equal.
4. Manhole Covers: Manhole cover for tank shall be watertight heavy duty flush mount covers with HS-25 load rating, composite type, with handles, and shall be a minimum of 42" diameter. The cover shall be of a composite material and shall not be composed of steel or wood. Manufacturer shall be as by OPW Conquistador, Model 44CD-PLKL with 90K-KLS Lift Key "Stick: Handle", or equal.
5. Underground Tank Fill Port Spill Containment: Provide a self-contained replaceable double-wall spill container at each fill port connection that is capable of storing a minimum of 5 gallons of petroleum product and equipped with a manual drain valve to release spilled product into the primary tank. The spill container shall have a watertight sealable cover that is HS-20 load rated. Manufacturer shall be as by OPW model EDGE, or equal.
 - a. FRP risers shall be provided by Containment Solutions for tank bung connections.
6. Underground Tank Stick Port: Provide a self-contained single-wall composite type sump as shown. Manufacturer shall be as by OPW model Fibrelite Composite Monitoring Manhole, or equal.
7. Provide leak detection sensors as stated in Section 231323, "Fuel Storage Systems" and as shown on the Drawings.
8. All fittings, entry boots, transitions, terminations, etc. for the underground containment piping systems shall be manufactured by the pipe manufacturer and used for the intended purpose.
9. Dispenser Sumps: Provide double-walled, brine-filled interstitial, fiberglass dispenser sump for each fuel dispenser. Dispenser sumps shall be compatible with the applicable fuel product and be sized and tailored to the specified dispenser model and to incorporate piping layout, fittings, and valves shown. All metal work shall be galvanized and epoxy coated with 30-year corrosion warranty. Manufacturer shall be as by Bravo (VPH B1000 Doublewall UDC), or equal.
10. All piping and conduit entry fittings shall be water tight to prevent water intrusion into sump.

2.03 VALVES

- A. Ball Valves: Provide MSS SP-110 Class 150 brass, two-piece body, full-port ball valve with union bonnet, blow-out proof stem, hard chrome-plated ball, Teflon seals, and threaded ends. Valve shall be specifically listed for use with intended service and piping system indicated on Drawings and this Specification. Manufacture shall be as by Morrison Bros. Co. (Model 691), or equal.
- B. Emergency Shut-Off Valves: Cast iron body, corrosion resistant internal components compatible with the stored product, double-poppeted valve with 165 degree Fahrenheit fusible link to shut off fuel flow in the event of a fire. Valve shall also provide impact protection such that no product is spilled in the event of a collision. Contractor shall provide manufacturer recommended anchor kit and hardware. Manufacturer shall be as by OPW (10 Plus Series), or equal.

2.04 EQUIPMENT CONNECTORS

- A. Flexible Connectors: Provide stainless steel flexible connectors as indicated or where necessary. Flexible connectors shall have at least one swivel and shall be constructed of 322 stainless steel hose with 304 stainless steel braid, Schedule 80 stainless steel fittings with Viton®/Buna Seals. Connector shall be UL-listed for the intended product and use.

2.05 HANGERS AND SUPPORTS

- A. MSS SP 58

2.06 PIPE-THREAD TAPE

- A. Anti-seize and sealant tape of polytetrafluoroethylene (PTFE). Shall be compatible with gasoline and diesel fuel. Manufacture shall be as by Gasoila (E-Seal), or equal.

2.07 BOLTING (BOLTS AND NUTS)

- A. Stainless steel bolting; ASTM A193, Grade B8M or B8MA, Type 316, for bolts; and ASTM A194, Grade 8M, Type 316, for nuts. Dimensions of bolts, studs, and nuts shall conform with ANSI/ASME B18.2.1 and ANSI/ASME B18.2.2 with coarse threads conforming to ANSI/ASME B1.1, with Class 2A fit for bolts and studs and Class 2B fit for nuts. Bolts or bolt-studs shall extend through the nuts and may have reduced shanks of a diameter not less than the diameter at root of threads. Bolts shall have American Standard regular square or heavy hexagon heads; nuts shall be American Standard heavy semi-finished hexagonal.

2.08 GASKETS

- A. Fluorinated elastomer, compatible with flange faces and fuels stored/transmitted.

2.09 IDENTIFICATION FOR FUEL PIPING SYSTEM

- A. Paint all new aboveground steel piping within sumps and dispensers in accordance with Section 099000, "Painting." Color to be per ANSI/ASME Standards. Two coats of paint shall be applied.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install fuel piping and equipment in accordance with 6 NYCRR Part 613, NFPA 30 and 30A, New York State Fire and Mechanical Codes, and manufacturer's instructions.
 - 1. Excavating and Backfilling: Perform excavating and backfilling of pipe trench as specified in Section 31 23 16, "Excavation" and Section 31 23 23, "Fill." Upon excavation, install new piping trench, as indicated. Concrete work and associated items shall be provided in accordance with Section 03 30 00, "Cast-in-Place Concrete". Coordinate provision of utility warning and identification tape with backfill operation. Bury utility warning and identification tape with printed side up at a depth of 12 inches below the top surface of earth or the top surface of the subgrade under pavements.
 - 2. Aboveground Piping: Cut pipe to actual dimensions and assemble to prevent residual stress.
 - a. Cleanliness: Clean inside of pipe and fittings before installation. Blow lines clear using 80 to 100 psig clean dry compressed air. Rap steel lines sharply along entire pipe length before blowing clear. Cap or plug pipe ends to maintain cleanliness throughout installation.
 - b. Aboveground Primary Steel Piping: Determine and establish measurements for piping at the job site and accurately cut pipe lengths accordingly. For 2-inch diameter and smaller, use threaded or socket-welded joints. For 2-1/2 inch diameter and larger, use flanged or butt welded joints.
 - (1) Threaded Joints: Where possible, use pipe with factory-cut threads, otherwise cut pipe ends square, remove fins and burrs, and cut taper pipe threads in accordance with ANSI/ASME B1.20.1. Provide threads smooth, clean, and full-cut. Apply anti-seize paste or tape to male threads portion. Work piping into place without springing or forcing. Backing off to permit alignment of threaded joints will not be permitted. Engage threads so that not more than three threads remain exposed. Use unions for connections to valves for which a means of disconnection is not otherwise provided.
 - (2) Welded Joints: Weld by the shielded metal-arc process, using covered electrodes and in accordance with procedures established and qualified in accordance with ANSI/ASME B31.8.
 - (3) Flanged Joints: Use flanged joints for connecting welded joint pipe and fittings to valves to provide for disconnection. Install joints so that flange faces bear uniformly on gaskets. Engage

- bolts so that there is complete threading through the nuts and tighten so that bolts are uniformly stressed and equally torqued.
- (4) Pipe Size Changes: Use reducing fittings for changes in pipe size. Size changes made with bushings will not be accepted.
 - c. Identification of Piping: Identify piping aboveground in accordance with MIL-STD-101, using weather-proof adhesive-backed or snap-on plastic labels and arrows. In lieu of labels, identification tags may be used. Apply labels or tags to finished paint at intervals of not more than 50 feet. Provide two copies of the piping identification code framed under glass and install where directed.
 - d. Flammable Liquids: Label piping containing flammable liquids in accordance with ANSI/ASME A13.1.
3. Underground Secondary Containment Piping System: Install secondary containment fuel pipe to locations as indicated. Prior to installation, obtain printed instructions, training, and technical assistance in proper installation techniques from manufacturer. The Contractor shall obtain the services of a competent manufacturer's representative to supervise Contractor's personnel during the start of the installation. Piping shall be sloped to drain into containment sumps as recommended by the manufacturer with no siphon traps or wells.
 4. Valves: Install valves approximately at locations indicated. Orient stems vertically, with operators on top, or horizontally. Mount with stems at 45 degrees from vertical where operation and serviceability will benefit. For threaded end valves, provide union adjacent to valve on downstream side.
 - a. Stop Valve and Shutoff Valve: Provide stop valve on service branch at connection to mains as indicated.
 5. Pipe Sleeves: Where piping penetrates concrete or masonry wall, floor, or firewall, provide pipe sleeve poured or grouted in place. Make sleeve of steel pipe of such size to provide 1/4-inch or more annular clearance around pipe. Extend sleeve through wall or slab and terminate flush with both surfaces. Pack annular space with oakum, and caulk at ends with silicone construction sealant.
 6. Piping Hangers and Supports: Selection, fabrication, and installation of piping hangers and supports shall conform with MSS SP 58, unless otherwise indicated.

3.02 FIELD QUALITY CONTROL

- A. Field Tests for Aboveground and Primary Containment Piping: Primary piping system shall be hydrostatically tested at 150 percent of the system design pressure but at least 50 psig with water not exceeding 100 degrees F, for a period of one hour. Before tests, remove or isolate gauges and other apparatus in the new system which may be damaged by high pressure. Repair leaks. Do not caulk joints. Install a calibrated, test pressure gauge in the system to observe loss in pressure. Maintain the required test pressure for a sufficient amount of time to enable an inspection of joints and connections. Correct defects disclosed by the test. Consult manufacturer's recommendations for further piping specific information. Perform line leak detector test for each line leak detector in accordance with manufacturer recommendations.
- B. Field Tests for Secondary Containment Piping: Pneumatically test all secondary containment piping in accordance with the manufacturer's recommendations. Piping incorporating compressible seal type containment terminations shall be tested at a minimum pressure of 2 psig for a period of not less than one hour.

- C. Field Tests for Underground Sumps: Contractor shall perform leak tests of all underground containment sumps. Testing shall be completed in accordance with 40 CFR Part 280.35.
- D. Startup and Operational Tests: Startup and initially operate the system. During this time, observe the operation of the system and correct any defects or abnormalities which may occur in the overall system.
- E. Warranty: All fuel piping systems equipment shall be warranted by the installer for a period of not less than two (2) years from acceptance date. All underground piping systems shall be warranted by the manufacturer for a period of not less than thirty (30) years from acceptance date.

END OF SECTION

SECTION 23 13 23

FUEL STORAGE AND DISPENSING SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Fuel Storage and Dispensing Systems, as shown on the Drawings, as specified and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1. American Petroleum Institute (API) Publications:

SPEC6D	Specification for Pipeline and Piping Valves
SPEC12F	Specification for Shop Welded Tanks for Storage of Production Liquids
STD 620	Design and Construction of Large, Welded, Low-Pressure Storage Tanks
STD 650	Welded Tanks for Oil Storage
STD 653	Tank Inspection, Repair, Alteration, and Reconstruction
STD 2000	Venting Atmospheric and Low-Pressure Storage Tanks
STD 2350	Overfill Protection for Storage Tanks in Petroleum Facilities

2. American Society for Testing and Materials (ASTM) Publication:

A53	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

3. National Fire Protection Association (NFPA) Publication:

17	Dry Chemical Extinguishing Systems
30	Flammable and Combustible Liquids Code
30A	Code for Motor Fuel Dispensing Facilities and Repair Garages

4. New York State Codes, Rules and Regulations (NYCRR):

6 NYCRR Part 613	Petroleum Bulk Storage

5. United States Environmental Protection Agency

40 CFR Part 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)
40 CFR Part 281	Approved Underground Storage Tank Programs
6. Fire Code of New York State:

23	Motor Fuel-Dispensing Facilities and Repair Garages
50	Hazardous Materials – General Provisions
57	Flammable and Combustible Liquids
7. Underwriters Laboratories, Inc. (UL) Publications:

142	Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids
971	Standard for Nonmetallic Underground Piping for Flammable Liquids
2085	Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids
8. Steel Tank Institute (STI) Publication:

F921	Standard for Aboveground Tanks with Integral Secondary Containment

1.03 GENERAL DESCRIPTION

- A. Under this Item, Contractor shall provide complete fuel storage and dispensing systems incorporating all necessary components and controls as shown and indicated. These specifications shall govern the installation of complete tank monitoring and fuel management and dispensing systems incorporating all necessary components and controls as shown and indicated. The Contractor shall provide all materials not reused, tools, equipment, labor and incidentals required to provide these systems.

1.04 RELATED WORK

- A. All earthwork shall be in accordance with Section 31 05 13, "Soils for Earthwork", Section 31 05 16, "Aggregates for Earthwork", Section 31 22 13, "Subgrade Preparation", Section 31 23 23, "Excavation", Section 31 23 23, "Fill"; all concrete shall be in accordance with Section 03 30 00, "Cast-In-Place Concrete", all electrical work shall be in accordance with Division 26, Electrical.

1.05 SUBMITTALS

- A. Comply with Section 01 33 00, Submittal Procedures.
- B. Manufacturer's Data, Installation Manuals, Operation and Maintenance Manuals, and Warranty Certificates:

1. Underground fuel storage tanks and accessories
 2. Fuel dispensers and accessories
 3. Fuel piping
 4. Fuel pumps and controllers
 5. Tank monitoring system and accessories
 6. Fuel management system
 7. Spill kits
 8. Fire Extinguishers
- C. Fabrication/Erection/Installation Drawings: Shop Drawings and manufacturer installation instructions. Submit design and installation drawings for the following that indicate and detail recommended installation procedures. Shop drawings require review from the Engineer prior to any installation work.
1. Underground fuel storage tanks and accessories
 2. Underground secondary containment tank top sump
- D. As-Built Drawings: Submit two (2) hard copy sets and one (1) digital file of as-built drawings meeting NYSDEC Certification requirements upon completion of project.
- E. Manufacturer Warranty: Submit warranty registration and written coverage verification from original manufacturer or warranty provider for all system components with manufacturer warranties.

PART 2 - PRODUCTS

2.01 UNDERGROUND FUEL STORAGE, MONITORING AND DISPENSING SYSTEM

- A. Underground Fuel Storage Tanks and Associated Equipment:
1. Underground Fuel Storage Tanks: Provide factory assembled, underground, double-wall, brine-filled interstice, fiberglass reinforced plastic (FRP) diesel fuel, unleaded gasoline, and non-ethanol gasoline storage tanks, anchoring system with hold down straps and pre-cast deadmen, hydrostatic leak detection system, and water tight double-wall, brine-filled interstice containment sumps with 30-year limited warranty. Tanks shall be UL labeled and constructed to meeting governing standards with certification plate (UL Label) affixed to the shell wall along with maximum burial depth. Manufacture shall be as by Containment Solutions, Inc. (DWT Type II), or equal.
 2. Underground Fuel Storage Tank Accessories: Provide underground storage tanks with connections as indicated on the Drawings, including 22-inch diameter manway with 4-inch tank level gauge with high level alarm, submersible pump, and 4-inch secondary containment leak monitoring of hydrostatic reservoir with vent cap. The 1,000-gallon non-ethanol gasoline tank shall include a 4" stick port with riser within the tank top sump. The tanks shall include a leak detection sump sensor, as shown, for the hydrostatic reservoir and for the leak detection of the underground piping connections to the tank. Tank top sump shall be fuel and watertight. The storage tanks shall include striker plates under all openings, atmospheric vent as shown, 4-inch fill connection with inlet drop tube, minimum five-gallon double wall spill containment bucket and manhole provided with interstitial electronic sensor (OPW EDGE Series, or equal), separate stick port with 12" watertight manhole (OPW Fibrelight Composite Manhole)(10,000-gal tanks only), and 42" watertight HS-25 rated heavy duty composite type manhole

cover and rim (OPW Fibrelight Composite Manhole). Tanks shall include overfill protection system consisting of audible alarm and strobe light activated at 90% tank capacity and automatic fill tube shut off device to stop flow of liquid into the tank when tank is no more than 95% full. Provide tank with manufacturer recommended nylon hold-down straps, neoprene pads, turnbuckles, and all other associated accessories for the intended installation shown. FRP riser pipes shall be provided for fill, hydrostatic reservoir leak detection, and stick port. FRP Risers shall be sized to incorporate an overfill prevention valve/4-inch drop tube assembly and shall be designed and made for the intended use as a riser pipe and shall be as by NOV FRP Systems, or equal. One (1) dipstick per tank shall be provided to measure remaining capacity of tanks. Dipstick shall be compatible with tank and product stored.

B. Fuel Dispensers:

1. Diesel Fuel/Gasoline Remote Dispensers: Provide three (3) new single-product (unleaded gasoline or diesel fuel), dual-nozzle dispensers, and one (1) dual product, dual-nozzle unleaded gasoline and non-ethanol gasoline dispenser, each consisting of one high-hose retractor for each nozzle, as shown. Dispensers shall have a nominal 22 gpm capacity for each diesel fuel nozzle, with minimum 12 feet and maximum 18 feet fueling radius (at grade), 1" inch hardwall dispensing hose with automatic closing type deadman nozzle, breakaway fittings, and double joint hose swivel. Dispensers shall be limited to 10 GPM EPA nozzle flow limit for each gasoline nozzle, with minimum 12 feet and maximum 18 feet fueling radius (at grade), 3/4" inch hardwall dispensing hose with automatic closing type deadman nozzle, breakaway fittings, double joint hose swivel, and filters for each product. Dispensers shall be island-mounted and island-oriented with underground containment sumps as indicated on the Drawings. Manufacturer shall be as by Wayne (Select Series), or equal.
2. Electronic Register Meter and Remote Dispenser Units: Provide UL listed (Class 1, Division 2) electronic register meter units enclosed within a heavy gauge cabinet with the lower hydraulic cabinet – door panels, base frame, and lower side panels constructed of stainless steel. Units shall include non-volatile electronic control unit/totalizer with backlit LCD display of transaction gallons, dispensed and total gallons, electromechanical non-resettable totalizer, 120 VAC power supply, -30°F to 150°F temperature range electronics heater, hose nozzle holder and all safeties and controls required for the proper dispensing of diesel fuel and gasoline. Units shall include weights and measures accuracy meter, associated piping, valves, controls, safety devices and accessories.
3. Dispenser Accessories: All dispenser accessories shall be UL listed. Dispensers shall be provided with all necessary hardware and software necessary to interface with the fuel management system for a complete and operational system. Provide each dispenser with reflective labeling for each hose visible from the fuel management system fuel island terminal. Dispenser numbering scheme to be approved by Owner. Provide product-specific colored nozzle covers for approval (yellow for diesel fuel, and black for gasoline)
4. Manufacturer Warranty: Each dispenser shall be provided with a two (2) year warranty for parts and labor except for cabinet which shall be warranted against corrosion for four (4) years.

5. Submersible Pumping Units: Provide one (1) new 2 horsepower, one (1) new 1.5 horsepower high pressure (X3), and one (1) new $\frac{3}{4}$ horsepower fixed speed submersible turbine pumps for diesel fuel, unleaded gasoline, and ethanol-free gasoline, respectively, and control modules as indicated on the Drawings and as required for complete and proper operation. Pumps shall be UL listed for operation in hazardous locations (Class 1, Group D atmospheres). Pumps shall supply the minimum flow rates listed above to dispenser when all nozzles are in operation. Pressure lines shall be equipped with a mechanical line leak detection system capable of detecting a 3 gallon per hour leak at 10 pounds per square inch line pressure within 1 hour and shall be plumbed to allow for ease of performing annual testing. Pumps shall be compatible with gasoline and diesel fuel. Manufacturer shall be as by Red Jacket, or equal.
 6. Submersible Pumping Unit Control Module: Provide each pump with a pump controller. Manufacturer shall be as by the pump manufacturer (Red Jacket, or equal).
- C. Tank Monitoring System: Provide integrated single control console for the monitoring of product level, product volume with statistical inventory reconciliation, temperature compensated product volume, sump leak sensors, interstitial leak sensors with remote input/output data communication capability and printed output. The leak detection system shall trigger the audible and visual alarms of the tank monitoring system when a leak is detected. The storage tank monitoring system shall be provided and installed with all necessary components for the complete and proper operation of the system as shown on the Drawings and specified herein. Manufacture shall be OPW (ProGauge MagLink LX Plus), or equal.
1. Monitoring System Panel: Provide wall mounted panel as indicated on Drawings. Controller shall have a backlit 7-inch color touchscreen display and USB thermal printer with paper. The main console will be preprogrammed by the factory and field adjusted as required. System shall be capable of making current inventory, sensor status and alarms available from web browser or smart phone. Alarms shall be displayed visually on a touch screen with wide viewing angle as well as Warning and Alarm lights on face of panel.
 2. Fix a laminated plastic label identifying "Fuel Storage Tank Monitoring System" to panel. All wiring internal to the panel shall be run in neat bundles secured by wire ties or run in nonmetallic slotted raceways. All internal wiring shall have wire numbers at each termination. Provide barriers as required to separate intrinsically safe (IS) wiring from non-IS wiring. Panel shall include numbered terminal strips for connection of field wiring to remote devices. Panel shall include all necessary mounting hardware for the permanent installation of the monitoring system where indicated on Drawings. Panel shall incorporate the following hardware options:
 - a. RS-232 port.
 - b. RS-485 port.
 - c. Ethernet / TCP/IP.
 - d. E-mail, and Text capability for communication.
 - e. Control modules for monitoring probes, sensors, and alarms specified herein.
 - f. Dry contact module for panel visual alarm.
 - g. Integral thermal printer.

3. Tank High Level Alarm: A remote high level alarm horn and strobe shall be provided for each tank as indicated on the Drawings. A high-level alarm horn acknowledgment switch shall be provided at remote fill stations. The high level alarm shall signal alarm at 90% tank capacity (tank working capacity). Provide signage at high level alarm that states: "WHEN ALARM SOUNDS TANK HAS REACHED CAPACITY. DO NOT OVERFILL."
4. Provide associated communications software and modules necessary for remote data communications as identified on the Drawings. Communications software shall be capable of translating all data to and from tank monitoring console control module to include product inventory, product height, water height, fuel temperature, leak detection data, sensor status, delivery data, alarm history, system configuration, tank status, and time and date. The system shall be able to generate reports through the communication interface in a display or printer. All reports may be retrieved locally or remotely. The system shall provide capability for accommodating future remote sites. Manufacture shall be as by Dover Fueling Solutions (OPW), or equal.
5. Underground Storage Tank Level Automatic Tank Gauging (ATG) Probe: Provide each tank with magnetostrictive type level probes for the continuous measurement of product height, water height, and temperature for remote output of gross and temperature compensated volumes. Manufacture shall be as by Dover Fueling Solutions (OPW) (Model DFS DMP), or equal.
6. Leak Detection Sensors: Provide interstitial space (tanks, tank top sumps, fill port spill bucket, and dispenser sumps), and secondary containment sumps with leak detection sensors. All leak sensor shall be micro-processor based and capable of recognizing its unique serial number, part number, and function. Sensors within tank top sumps and dispenser sump main bodies shall be product discriminating and capable of detecting petroleum and water. Brine interstitial sensors shall be non-discriminating. Sensors shall be remotely testable from console via test button. Provide laminated probe and sensor identification drawing and cross reference chart at the Tank Monitor Panel. Manufacture shall be as by Dover Fueling Solutions (OPW) (IntelliSense™ Sensors), or equal.

D. Fuel Management System: The fuel management system shall provide automated controlled access to fuel dispensing equipment by use of a MagStripe Card and ChipKey reader by the fuel island terminal indicated on the Drawings. The system shall grant fueling access upon use of card swipe or ChipKey insert and entry of vehicle odometer (actual combination of entries to be determined by Owner at time of installation). The system shall include two (2) fuel island terminals (FIT) and two (2) fuel site controllers (FSC) as indicated on the Drawings. The fuel management system shall be provided and installed with all necessary components for the complete and proper operation of the system as shown on the Drawings and stated herein. The fuel management system shall be manufactured by OPW, or equal. FIT shall be model PV200 and the FSC shall be model Synergy, or equal.

1. The FSC shall be installed within the FIT as shown on the Drawings.
2. The FIT units shall be mounted on an integral manufacturer supplied pedestal in accordance with the manufacturer's installation instructions. The interface side of the FIT shall be oriented such that it is not obstructed by other equipment/structures on the fueling island and can be easily accessed from either side of the island. The user interfaces of the FIT shall face the direction as indicated on the Drawings. The FIT shall have a minimum 7-inch color display

and the pedestal and cabinet shall be of powder-coated aluminum construction. The cabinet door shall be removable to facilitate offsite service. Operating range of the FIT shall be -40°F to 122°F. The FIT shall have a USB memory key for transaction backup/transfer.

3. The fuel management system shall utilize Direct Pump Control communications with the fuel dispensers and shall be provided with distribution box(es) and all software, cables, and interfaces for a complete and operational system. The system shall be capable of controlling the number of onsite fueling points as indicated on the Drawings.
4. The fuel management system shall be integrated with use of up to 400 of the Owner's existing PV100 magnetic stripe cards.
5. The fuel management system shall be provided with network connections which enable the data to be polled from a cloud-based interface. The system shall be provided with DX Fleet cloud software, coordinate with the Owner's IT Department.
6. The fuel management system shall also be capable of interfacing with the storage tank monitoring system.
7. The fuel management system shall be provided with cloud-based software to poll, process and maintain data collected, or be managed by the Fuel Site Controller.
 - a. The cloud-based software shall be able to communicate via cellular, wireless connection or Ethernet.
 - b. The cloud-based software shall be provided to automate the capture of data by establishing a connection to remote sites. The capture process shall be continuous and updates shall be in real-time.
 - c. The cloud-based software shall have a real-time continuous backup/restore function that allows the user to backup and restore all card and account records and system configuration data.
 - d. The cloud-based software shall have a data export utility capable of exporting transaction data in the following formats: Excel, CSV, XML, HTML and other Windows® supported formats.
 - e. The cloud-based software shall have the ability to run more than 50 different reports including, but not limited to:
 - Department Usage History Report
 - Cardlock Product Usage History
 - Cardlock Site Usage History Report
 - Vehicle report including mpg and cost per mile
 - Pump Reconciliation Report
 - Card Master File Listing
 - Vehicle Master File Listing
 - Account Master File Listing
 - Site Listing
 - Product Listing
 - Transaction History Report
 - Fuel Summary Report
 - f. The cloud-based software shall have the ability to poll data from the Fuel Site Controller and Tank Monitoring System. The software shall have the ability to check fuel inventories, generate reports based on the Storage Tank Monitoring System data and compare the inventory and delivery data from the Storage Tank Monitoring System with the

transaction data from the Fuel Site Controller and generate reconciliation reports.

8. Programming: Contractor shall program existing fleet into fuel management system and coordinate information and reporting needs with Owner for a complete and operational system. Dispensing devices shall be programmed or set to limit uninterrupted fuel delivery to 25 gallons and require a manual action to resume delivery, or, the amount of fuel being dispensed shall be limited in quantity by a preprogrammed card as approved.
 9. Operational Training: As a part of the fuel management system, the Contractor shall provide a minimum of one (1) day (8 hours) of operational training in addition to software installation/setup by a manufacturer's factory authorized technician experienced in the setup and operation of the equipment and software systems.
- E. Fire Extinguishers: Provide and install fire extinguishers in accordance with NFPA 30A and Fire Code of New York State Chapter 23 as indicated on the Drawings and as specified. The fire extinguishers have a minimum rating of 2-A:20-B:C and shall be located within 75 feet of all pumps, dispensers, or storage tank openings. Extinguishers shall be provided within a glass storage enclosure and clearly marked "Fire Extinguisher". Provide additional signage to clearly indicate extinguisher location from all fueling locations.
- F. Spill Kits: Provide oil-only spill kit(s) capable of containing and absorbing a minimum of 52 gallons of spilled gasoline or diesel fuel located at remote fill stations and as indicated on the Drawings. Spill kit(s) to be supplied in high-visibility UV protected weather tight containers or weather tight over pack containers with high-visibility UV protective cover. Oil-only spill kits and covers shall be high visibility yellow color and labeled "For Use with Gasoline and Diesel Fuel Spills". Manufacturer of oil-only spill kit shall be as by FIG, Kit 402, or equal.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Underground Storage Tank and Piping: Tank and piping systems shall be installed in strict accordance with the manufacturer's installation instructions and as indicated. Handle tank during transportation and while lifting in such a manner as to prevent damage to tank. The tank shall be tested for tightness by the manufacturer prior to delivery, and an air (pneumatic tightness) test of the primary tank shall be conducted prior to tank installation in accordance with the manufacturer's instructions. Inspection of the outer wall of the tank shall be conducted in accordance with the manufacturer's instructions for any signs of leaks of the green filled brine interstitial space. At no time shall the wet-filled interstitial space be pressurized. Care shall be taken during installation that foreign matter is not introduced into the excavation or backfill. The bottom of the excavation shall be covered with clean pea stone to depth shown on drawings suitable graded and leveled. Before placing the tank in the excavation, all dirt clods and similar foreign matter shall be cleaned from the tank as required by the manufacturer to prevent any voids when backfilling. Equipment to lift the tank shall be of adequate size to lift and lower the tank without dragging and dropping to ensure non damage to the tank. Tank shall be carefully lifted and lowered by use of cables or chains attached to the lifting lugs

provided. A spreader bar shall be used where necessary per the manufacturer's instructions. Under no circumstances shall chains or slings be used around the tank shell. Tank shall be inspected prior to installation to verify that no damage to the tank has occurred. Any damage must be repaired to new or better condition by a manufacturer approved repair technician.

- B. Signage: All warning and safety signage shall be provided and constructed in compliance with NFPA Chapters 30 & 30A, and New York State Fire Code Chapters 23, 50 and 57, and any other local, State or Federal requirements. Signage shall be metal backed construction, permanently mounted and of the color and sizes dictated by the applicable code and regulation. The Contractor shall provide signage including, but not limited to the following:

1. Flammable/Combustible Liquid General Requirements:

a. Flammable Liquid General Requirements:

Labeling and Signage Style. Durable metal backed construction; white lettering on red background. Letters shall be not less than 3 inches in height and 0.5 inch in stroke. For warning of the hazard of flammable liquids:

“DANGER – FLAMMABLE LIQUIDS” (for gasoline only)

“DANGER – COMBUSTIBLE LIQUIDS” (for diesel fuel only)

Location. Post conspicuously on all dispenser areas or as additionally required by code enforcement official. Piping containing flammable liquids shall be identified in accordance with ANSI A13.1.

Identification. Color coding or other approved identification means consistent with Title 6 NYCRR Part 613 shall be provided on each loading and unloading riser for flammable or combustible liquids to identify the contents of the tank served by the riser.

b. Emergency Disconnect Switches. All emergency disconnect switches shall be distinctly labeled as:

“Emergency Fuel Shutoff”

c. Dispensing Operations:

Operating instructions. Dispenser operating instructions shall be conspicuously posted in approved locations on every dispenser and shall indicate the location of the emergency controls.

Dispensing product: A sign identifying the product being dispensed shall be conspicuously posted on each dispenser at the corresponding product dispensing hose/nozzle.

d. Provide signage with instructions for emergency procedures (respective to facility):

“In Case of Fire, Spill or Release:

- 1) Use Emergency Pump Shutoff
 - 2) Report The Accident to:
 - Fire Department Telephone No.: 911
 - New York State Dec Spill Hotline No.: (800) 457-7362
 - Facility Name: Oneida County Department of Public Works
 - Facility Address: 5999 Judd Road, Oriskany NY 13424
 - Phone: (315) 793-6213
- e. Warning signs. Posted conspicuously in the sight of each dispenser in the fuel-dispensing area, signage that is metal backed construction, signage warning against the following:
- 1) No smoking.
 - 2) Shut off motor.
 - 3) Discharge your static electricity before fueling by touching a metal surface away from the nozzle.
 - 4) To prevent static charge, do not reenter your vehicle while gasoline is pumping.
 - 5) If a fire starts, do not remove nozzle – back away immediately.
 - 6) It is unlawful and dangerous to dispense gasoline into unapproved containers.
 - 7) No filling of portable containers in or on a motor vehicle. Place container on ground before filling.
- f. Hazard identification signs. Unless exempted by the code enforcement official, visible hazard identification signs in accordance with NFPA 704 for the specific material contained shall be placed on all aboveground tanks. The hazard placarding shall include NFPA Hazard Diamond at a minimum. All tanks should also be labeled with fire hazard: “DANGER – FLAMMABLE LIQUIDS” or “DANGER – COMBUSTIBLE LIQUIDS”.
- g. Smoking. Smoking shall be prohibited and “No Smoking or Open Flame” signs provided within 25 feet of outdoor storage, dispensing or open use areas.
- h. NYSDEC Required Labels (for all tanks unless indicated otherwise):
- 1) Tank Label (to be affixed on a sign for USTs):
 - a) A unique tank identification number, to be provided by Owner.
 - b) Design Capacity and Working Capacity.
 - c) Products stored.
 - d) The standard of design by which the tank was manufactured.
 - e) The percentages of volume of petroleum additives which may be stored permanently and compatibly within the tank or reference to a list available from the manufacturer, which identifies products compatible with all tank materials.
 - f) The year in which the tank was manufactured.

- g) The dimensions of the tank.
- h) The name of the manufacturer.
- i) The model number of the tank.
- 2) Tank Gauge Label (to be affixed to gauge):
 - a) NYSDEC tank identification number
 - b) Design Capacity and Working Capacity; and
 - c) Products stored.
- 3) Fill Port Cover Color Code
 - a) Color code per the products stored in accordance with API and NYSDEC.
- 4) Fill Port Interior Label (USTs – Provide metal tag conspicuously displayed and permanently affixed at the fill port.
 - a) NYSDEC tank identification number.
 - b) Design Capacity and Working Capacity.
 - c) Products stored.
 - d) The standard of design by which the tank was manufactured.
 - e) The percentages of volume of petroleum additives which may be stored permanently and compatibly within the tank or reference to a list available from the manufacturer, which identifies products compatible with all tank materials.
 - f) The year in which the tank was manufactured.
 - g) The dimensions of the tank.
 - h) The name of the manufacturer.
 - i) The model number of the tank.
- 5) High Level Alarm Label (to be affixed as shown at alarm; same required information as Tank Gauge Label)
- i. NYSDEC Additional Label Requirements
 - 1) Provide a laminated, tank-specific conversion chart from depth of product (in inches and feet) to gallons, visible at fill port.
 - 2) Provide identification and response procedure labels for all alarms, horns, strobes, and monitoring systems.
- j. Transfer Containment Area: Mount sign at remote fill station :
 - “PRIOR TO FUEL DELIVERY:
 - FOLLOW FACILITY FUELING PROCEDURES,
 - CHECK ALL HOSE CONNECTIONS,
 - REPORT ANY SPILLS IMMEDIATELY
 - WHEN ALARM SOUNDS TANK HAS REACHED CAPACITY. DO NOT OVERFILL”
- k. Provide identification and response procedure labels for all alarms, horns, strobes, and monitoring systems.

C. Fuel Dispensers: Fuel dispensers shall be provided, complete with piping and equipment, and installed for a complete and operational system. Electrical connections shall be in accordance with Section 26 05 01 “Electrical General Requirements”. Follow manufacturer’s recommendations for installation and initial startup.

- D. Fuel Control Equipment: Install all equipment in accordance with Section 26 05 01 “Electrical General Requirements” and per manufacturer's recommendations. For initial startup of all fuel control equipment, appropriate factory authorized representatives shall be present to calibrate and check all systems for operational status at no additional cost to the Owner. Factory authorized representatives shall also instruct Owner as to operational procedures and maintenance schedule.
- E. Storage Tank Monitoring and Fuel Management System Equipment: Install all monitoring and management equipment in strict accordance with the manufacturer's recommendations. Installation of the monitoring equipment shall be conducted by a manufacturer certified technician. Electrical wiring and connections shall be in accordance with Section 26 05 01 “Electrical General Requirements”. Following installation, programming, troubleshooting, and startup of installed systems, provide a minimum of 8 hours of training for the operation of tank monitor system and an additional 8-hours of training for the operation, programming, and reporting features of the fuel management systems by factory authorized technicians.
- F. Equipment Start-Up: The Contractor shall start up and operate the new equipment systems under direct responsibility and supervision of the manufacturer, and in the presence of the Owner’s representative. The Contractor shall provide all labor, equipment and materials that are required to facilitate the new equipment start-up and initial operation. The Contractor, under the direction of the respective manufacturer’s representative, shall perform all work of placing into operation all equipment systems provided by him, except as specifically noted otherwise. Make all adjustments to equipment that are necessary to assure proper operation as instructed by the manufacturer of the equipment.
- G. Warranty: All fuel storage systems equipment shall be warranted for a period of not less than two (2) years from acceptance date.

END OF SECTION

SECTION 26 05 01

ELECTRICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Electrical General Requirements, as shown on the Plans, as specified and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. Federal Specification (Fed. Spec.):
 - a. L-P-387A - Plastic Sheet, Laminated, Thermosetting (for Design Plates)
 - 2. American National Standards Institute (ANSI) Publications:
 - a. C37.20 - Switchgear Assemblies, Including Metal-Enclosed Bus
 - b. Z35.1 - Accident Prevention Signs
 - 3. Institute of Electrical and Electronics Engineers (IEEE) Publication:
 - a. 100 - Standard Dictionary of Electrical and Electronics Terms
 - 4. National Electrical Manufacturers Association (NEMA) Publication:
 - a. ICS 6 - Enclosures for Industrial Controls and Systems
 - 5. National Fire Protection Association (NFPA) Publications:
 - a. 70B - Electrical Equipment Maintenance
 - b. 70 - National Electrical Code

1.03 APPLICATION

- A. This Section applies to all sections of Division 26, "Electrical", of this project except as specified otherwise in each individual section.

1.04 DEFINITION OF ELECTRICAL TERMS

- A. Unless otherwise specified or indicated, electrical terms used in these Specifications, and on the drawings, shall be as defined in IEEE Standard No. 100.

1.05 ELECTRICAL UTILITY COORDINATION & ELECTRICAL SYSTEM VERIFICATION

- A. Contractor shall coordinate all pre and post construction activities with the Electrical Utility (EU) provider per the EUs written bulletin/specification requirements. For new service, Contractor must submit a complete set of shop drawings of the new service entrance equipment for the utility's approval.
- B. Prior to shop drawing submittals, prior to commencing any demolition and/or prior to commencing any new construction activities, electrical characteristics for all existing and/or proposed electrical systems (including service, premises wiring systems and/or separately derived systems) shall be verified by this Contractor.
- C. The Contractor shall coordinate and confirm, in writing, the following information from the Electrical Utility prior to commencement of any work under this Contract:
 - 1. Voltage
 - 2. Number of phases
 - 3. Type of system grounding
 - 4. Metering arrangement and Style
 - 5. Electrical Service Capacity
 - 6. System impedances and available fault current at point of common coupling (PCC)
- D. Should the Contractor's verification of any existing or proposed electrical system indicate a discrepancy with the Contract Documents, report them immediately to the Owner and/or Owners designated representative.
- E. Submitting shop drawings and/or commencing any work under this Contract prior to all electrical systems verification/confirmation as required above signifies that Contractor accepts all existing and proposed electrical system characteristics and conditions.

1.06 SUBMITTALS

- A. Obtain approval before procurement, fabrication, or delivery of items to the job site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Military, industry, and technical society publication references, and other information necessary to establish contract compliance of each item to be furnished. Furnish a minimum of six (6) copies of shop drawings for each major device specified or electronic shop drawings as specified herein. All hard copy shop drawings shall be a minimum of 8.5 inches by 11 inches in size.
- B. Shop Drawings: In addition to the requirements specified elsewhere, shop drawings shall meet the following requirements. Drawings shall include complete

ratings information, wiring diagrams, and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to assure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. If equipment is disapproved, revise drawings to show acceptable equipment and resubmit.

- C. **Manufacturer's Data:** Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.
- D. **Publication Compliance:** Where equipment or materials are specified to conform to industry and technical society publications of organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), and Underwriters' Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears. In lieu of the label or listing, submit a certificate from an approved independent testing organization, adequately equipped and competent to perform such services, stating that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's publication.
- E. **Submittals Required:** Supply shop drawing submittal information as otherwise noted in each individual section.
- F. **Electronic Shop Drawings:** If allowed by other sections of these Contract Documents, electronic submittals shall be submitted to Engineer in accordance with procedures outlined in these Contract Documents, as established at a preconstruction meeting and/or per Engineer's written instructions.
 - 1. Electronic shop drawings shall be submitted in an OCR (searchable) PDF file format or per Engineer's instructions. Each shop drawing shall be a single electronic file with correct orientation of all sheets contained within.
 - 2. Electronic shop drawings shall be scaled to print at 8.5 inches by 11 inches (for general information, manufacturer's product data, etc.) and as required for drawings (layout drawings, coordination drawings, schematics, site drawings, electronic copy), except as specified otherwise.
 - 3. Engineer shall make final determination on clarity of electronic shop drawings and will reject electronic shop drawing if resolution is not acceptable.

1.07 OPERATION AND MAINTENANCE MANUAL

- A. Submit as required for systems and equipment indicated in the technical sections. Furnish 3 copies, bound in hardback binders or an approved equivalent. Furnish one complete manual prior to performance of systems or equipment tests, and furnish the remaining manuals prior to contract completion. Inscribe the following identification on the cover: the words "OPERATION AND MAINTENANCE MANUAL", the name and location of the system, equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment. Include a table of contents and assemble the manual to conform to the table of contents, with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include:
1. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the system or equipment.
 2. A control sequence describing startup, operation, and shutdown.
 3. Description of the function of each principal item of equipment.
 4. Installation and maintenance instructions.
 5. Safety precautions.
 6. Diagrams and illustrations.
 7. Testing methods.
 8. Performance data.
Lubrication schedule including type, grade, temperature range, and frequency.
 9. Parts list. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.
 10. Appendix: List qualified permanent servicing organizations for support of the equipment, including addresses and certified qualifications.
- B. Electronic Version: Provide a complete O&M as a single PDF file, or multiple files if there are significant amounts of data. PDF file(s) shall be an optical character recognition (OCR) or searchable file.

1.08 SPARE PARTS

- A. Provide spare parts for all equipment installed under this Contract, as indicated in individual specification sections.

1.09 POSTED OPERATING INSTRUCTIONS

- A. Furnish approved operating instructions for systems and equipment indicated in the technical sections for use by operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams, and control sequence for each principal system and equipment. Print or engrave operating instructions and frame under glass or in approved laminated plastic.

Post instructions as directed. Attach or post operating instructions adjacent to each principal system and equipment including startup, proper adjustment, operating, lubrication, shutdown, safety precautions, procedure in the event of equipment failure, and other items of instruction as recommended by the manufacturer of each system or equipment. Provide weather-resistant materials or weatherproof enclosures for operating instructions exposed to the weather. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.10 INSTRUCTION TO OWNER'S PERSONNEL

- A. Where indicated in the technical sections, furnish the services of competent instructors to give full instruction to Owner's personnel in the adjustment, operation, and maintenance of systems and equipment, including pertinent safety requirements as required. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Owner for regular operation. The number of man days (8 hours) of instruction furnished shall be as specified in each individual section.

1.11 LAYOUT OF THE WORK

- A. Coordinate the proper relation of the work to the building structure, existing utilities and to the work of all trades. Visit the premises and become familiar with the dimensions in the field, and advise the Owner's Representative of any discrepancy before performing any work.
 - 1. Contract Drawings: The Contract Drawings represent the general intent as to layout and equipment arrangements. All locations and dimensions shown shall be field verified and minor alterations made if so required. Where dimensions are not given for the location and arrangement of mechanical systems, locations may be assumed to be approximate, and may be altered if required. Major modifications to the indicated arrangements shall be approved by the Owner's Representative prior to the installation of mechanical systems. Schematic diagrams represent the overall system requirements and do not necessarily indicate the physical orientation, location or dimensions of that system.
 - 2. Coordination Drawings: Each Contractor and/or his Subcontractor shall submit drawings showing the coordination of work between work of their respective trade and with the work of the other trades and structural and architectural elements of the work. Items to be shown on the drawings shall include, but are not limited to, ductwork systems, control dampers, HVAC piping, plumbing piping, plumbing fixtures, fire protection piping, sprinkler head layout, smoke detectors, heat detectors, light fixtures, electrical equipment, pull boxes, and conduit runs that utilize a 1-inch diameter or larger conduit. Drawings shall be in sufficient detail to show overall dimensions of related items, clearances and relative location of work in the allotted spaces. Drawings shall indicate any routing changes that are required to be made to resolve clearance problems between the elements of various trades.
 - a. Each Contractor and/or his Subcontractor shall be solely responsible for the generation of the coordination drawings including distribution to, and collection of related information from each Contractor or Subcontractor. Drawings shall be produced in AutoCAD format and submitted on sheets no larger

than 24 x 36-inches. Upon written request, background drawings will be provided to the Contractor for the purpose of coordination drawing development. The Owner or Engineer does not warranty the accuracy of any background drawings provided and the Contractor shall be responsible to field verify all background drawings. Submit complete drawings to Engineer a minimum of one week prior to the intended start of the related construction.

3. Record Drawings: The Contractor shall maintain a record of the progress of the work and shall submit three (3) hard copy sets of As-Built Drawings upon completion of the project.

1.12 DELIVERY AND STORAGE

- A. Handle, store, and protect equipment and materials in accordance with the manufacturer's recommendations and with the requirements of NFPA 70B, Appendix I, titled "Equipment Storage and Maintenance During Construction". Replace damaged or defective items with new items.

1.13 SPECIAL CONDITIONS

- A. When performing work within active DPW areas, the Contractor shall be responsible to coordinate with the Owner regarding planned interruptions to electrical services and/or road access. Contractor must maintain in service the existing electrical services at the existing DPW unless otherwise coordinated with the Owner.
- B. Protection of Existing Work: The Contractor shall take all necessary precautions to ensure against damage to existing work to remain in place, or to be reused. The Contractor shall ensure that structural elements are not overloaded and additional structural supports required as a result of any cutting, removal or demolition work performed under any part of this Contract are added. Unless specified otherwise, the Contractor shall submit for review detailed shop drawings applicable to the Contract work for all structural supports, hangers and related devices, structural modifications, temporary rigging and associated rigging plans. Commencement of such work prior to the submission and review of applicable shop drawings shall be at the sole risk of the Contractor.
- C. Upon damage to existing equipment, buildings, and/or structures, the Contractor shall immediately notify the Owner. All damages shall be repaired by the Contractor, or shall be replaced if beyond repair, to match the existing to the Owner's satisfaction.
- D. Protection of Buildings from the Weather: The interior of the buildings and all materials and equipment shall be protected from the weather at all times.
- E. Protection of Personnel: Where the safety of non-contractor personnel is endangered in the area of the work, barricades shall be used. Additional

protection shall be provided if required, to preserve the safety of non-contractor personnel in the immediate area of the work.

- F. Contractor shall maintain open road access at all times to the existing DPW. Contractor shall stage construction such that at least one lane of the existing access road is open at all times. Contractor shall coordinate with the Owner a minimum of one week prior to any planned road closings.
- G. Construction in Existing Buildings: Verify with Owner expected routing of new wire and/or conduit within existing equipment or buildings prior to field construction of systems. Coordinate with the Owner a minimum of ten (10) working days prior to any planned disruption of existing working systems.

1.14 CATALOGED PRODUCTS/SERVICE AVAILABILITY

- A. Materials and equipment shall be current products by manufacturers regularly engaged in the production of such products. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The 2-year period shall be satisfactorily completed by a product for sale on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished. The equipment items shall be supported by service organizations which are reasonably convenient to the equipment installation in order to render satisfactory service to the equipment on a regular and emergency basis during the warranty period of the Contract.

1.15 MANUFACTURER'S RECOMMENDATIONS

- A. Where installation procedures or any part thereof are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendations shall be cause for rejection of the equipment or material. Obtain manufacturer's recommendations from the Owner for equipment and/or material provided by the Owner.

1.16 MOTORS AND MOTOR CONTROLS FOR MECHANICAL EQUIPMENT

- A. The electrical components of mechanical equipment, such as motors, motor starters, control or push button stations, float or pressure switches, solenoid valves, and other devices functioning to control mechanical equipment, and control wiring and conduit for circuits rated 100 volts or less, are specified in the section covering the associated mechanical equipment, rather than in Division 26, unless otherwise shown. The interconnecting power wiring and conduit, control wiring rated 120 volts (nominal) and conduit, and the electrical power circuits

shall be furnished and installed under Division 26 in accordance with other sections and/or as shown on the Contract Drawings.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. All materials, equipment, and devices shall, as a minimum, meet the requirements of UL where UL standards are established for those items, and the requirements of NFPA 70. All items shall be new unless specified or indicated otherwise.

2.02 NAMEPLATES

- A. Fed. Spec. L-P-387. Provide laminated plastic nameplates for each panelboard, equipment enclosure, relay, switch, and device. Each nameplate inscription shall identify the function and, when applicable, the position. Nameplates shall be melamine plastic, 0.125-inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the black core. Minimum size of nameplates shall be 1.0 inch by 2.5 inches. Lettering shall be a minimum of 0.25-inch high normal block style.
- B. For sites with power generation equipment: Provide permanent nameplate at service entrance equipment indicating type and location of on-site generation power source (generator, PV, co-gen, etc.) in accordance with NEC Article 705. Provide same nameplate at generation sources main disconnect indication type and location of service entrance equipment.

PART 3 - EXECUTION

3.01 NAMEPLATE MOUNTING

- A. Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of two sheet-metal screws or two rivets.
- B. Provide nameplates for all equipment as required by other sections.
- C. Provide nameplates for all owner furnished equipment that is installed by this Contractor.

3.02 PAINTING OF EQUIPMENT

- A. Factory Applied: Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA ICS 6

corrosion-resistance test, except equipment specified to meet requirements of ANSI C37.20 shall have a finish as specified in ANSI C37.20.

3.03 TESTS

- A. General: Perform and record all tests in the presence of the Owner's authorized representative and/or the Engineer. Furnish all instruments and personnel. Perform preliminary tests and correct all defective material and/or workmanship prior to witness of tests. Perform tests as indicated and as otherwise noted in other Sections of the Division 26.
- B. Conduct field tests in the sequence listed below:
 - 1. Insulation Resistance Tests: As required per individual specification sections.
- C. Load Balance Test: Make test by energizing all lighting, motors and other electrical equipment simultaneously for a three-hour period. Alter fuses, circuit breakers, circuit connections, etc., as required for satisfactory performance. Take voltage and amperage readings on each circuit at all panels.
- D. Check the amperage draw, voltage and direction of rotation of each motor in the presence of the equipment contractor and the Owner's representative. Make all necessary changes to obtain proper rotation, motor terminal voltage, motor protection, etc. Revise heater elements as necessary for proper motor protection. Similarly check all other electrically connected equipment.
 - 1. Make the test at a time during the day or night that is mutually satisfactory to the Owner at least one week prior to substantial completion. Make all arrangements and notify all parties in writing at least seventy-two hours prior to the test.
- E. Equipment Operation Test - Show by demonstration in service that all circuits are in good operating condition. Cycle all control equipment under load at least five times.
- F. Equipment and apparatus factory tests - Manufacturer's normal quality control tests are acceptable, unless specific factory witnessed tests are specified in other sections.
- G. Perform all other field tests as required in individual specification sections.

3.04 CLEANING

- A. When directed, just prior to final acceptance, clean all equipment including, but not limited to, the following:
 - 1. Lighting fixtures, panelboards, control centers, switchgear, receptacles and switch plates - Remove all tags and labels; leave ready for use
 - 2. All equipment to be painted, removing all rust, etc., and leave ready for painting

3. Building, by removing all debris, conduits, wire, insulation, cartons, etc., left as a result of this work.

3.05 THIRD PARTY INSPECTION AND MISC SERVICES COORDINATION

- A. Contractor shall provide and pay for inspection of electrical work by an AHJ approved electrical inspection agency.
- B. Contractor shall coordinate with the Owner regarding connections to existing systems and work within existing buildings and equipment.

3.06 WORK WITHIN EXISTING BUILDINGS

- A. Contractor shall install new feeder breakers in existing panels and shall install new conduit and wire systems within existing buildings. Contractor shall use care in installation of new work and shall protect existing work and finishes in his work area. Contractor shall immediately notify Owner of any damages to existing equipment or finishes and shall restore damaged items to Owner's satisfaction.

END OF SECTION

SECTION 26 05 02

MINOR ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Interior demolition, removal and abandonment of interior electrical systems.
- B. Cleaning and repair of existing equipment to remain.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching work: As specified in individual sections.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as shown on drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents. Report discrepancies to Engineer before disturbing existing installation.
- D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Provide temporary wiring and connections to maintain existing systems in service during construction.
- C. Maintain existing systems in service until new systems are complete and ready for operation. Disable systems only to make switch overs and connections. Closely coordinate interruptions with Owner, providing at least 48 hours notice prior to outages. Minimize outage durations. Such work will normally be performed

nights, weekends, or other times when building is not occupied for normal operations.

3.03 DEMOLITION EXISTING ELECTRICAL WORK

- A. Remove existing installations to accommodate requirements for new construction.
- B. Remove abandoned wiring to source of supply, unless otherwise noted on Contract Drawings.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.
- E. Disconnect and remove abandoned panelboards and distribution equipment.
- F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- G. Repair adjacent construction and finishes damaged during demolition work.
- H. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

3.04 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections.
- C. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

END OF SECTION

SECTION 26 05 19

WIRING/CABLE, 600 VOLTS AND UNDER

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials, equipment and accessories for Wiring/Cable, 600 Volts and Under, as shown on the Plans, as specified and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only and shall be the most current version.
 - 1. National Electrical Manufacturers Association (NECA) Publication:
 - a. Standard of Installation
 - 2. International Electrical Testing Association (NETA) Publication:
 - a. ATS - Electrical Power Distribution Equipment and Systems
 - 3. National Fire Protection Association (NFPA) Publication:
 - a. 70 - National Electrical Code
 - 4. American Society for Testing and Materials (ASTM) Publications:
 - a. B1 - Hard-Drawn Copper Wire
 - b. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
 - c. E14 - Fire Tests of Through-Penetration Fire Stops
 - 5. Underwriters Laboratories, Inc. (UL) Publications:
 - a. 854 - Service Entrance Cables
 - b. 486A - Wire Connector and Soldering Lugs for Use with Copper Conductors
 - c. 486C - Splicing Wiring Connectors
 - d. 1569 - Metal-Clad Cables

1.03 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.
- B. Specification required test results.

1.04 PRODUCT DELIVERY

- A. Mark and tag insulated conductors and cables for delivery to the site. Include:
 - 1. Contractor's name.
 - 2. Project title and number.

3. Date of manufacture (month & year).
4. Manufacturer's name.
5. Environmental suitability information (listed or marked "sunlight resistant" where exposed to direct rays of sun; wet locations listed/marked for use in wet locations; other applications listed/marked suitable for the applications).

PART 2 - PRODUCTS

2.01 INSULATED CONDUCTORS AND CABLES

- A. Date of Manufacture: No insulated conductor more than one year old when delivered to the site will be acceptable.
- B. Acceptable Companies: American Insulated Wire Corp., BICC General Cable Industries, Inc., Cerro Wire & Cable Co. Inc., Pirelli Cable Corp., Owl Cable Corp., or Southwire Co.
- C. Conductors: Annealed uncoated copper or annealed coated copper in conformance with the applicable standards for the type of insulation to be applied on the conductor. Conductor sizes No. 12 and larger shall be stranded.
- D. Types:
 1. Lighting and Power Wiring:
 2. Insulation: Unless specified or indicated otherwise or required by NFPA 70, power and lighting wires shall be 600-volt, Type THW, THWN, XHHW, or RHW, except that grounding wire may be Type TW. Where lighting fixtures require 90-degree C conductors, provide only conductors with 90-degree C insulation or better. Class 1, 2, 3 Wiring: Minimum size for branch circuits shall be No. 12 AWG; for Class 1 remote-control and signal circuits, No. 14 AWG; and for Class 2 low-energy, remote-control and signal circuits, No. 16 AWG.

2.02 CONNECTORS

- A. General:
 1. Connectors specified are part of a system. Furnish connectors and components, and use specific tools and methods as recommended by connector manufacturer to form complete connector system.
 2. Connectors shall be capable of continuous operation at the current rating of the cables on which they are used.
 3. Connectors shall be UL 486 A listed, or UL 486 B listed for combination dual rated copper/aluminum connectors (marked AL7CU for 75 degrees C rated circuits and AL9CU for 90 degrees C rated circuits).

- B. Splices:
1. Spring Type:
 - a. Rated 105° C, 600V; Buchanan/Ideal Industries Inc.'s B-Cap, Electrical Products Div./3M's Scotchlok Type Y, R, G, B, O/B+, R/Y+, or B/G+, or Ideal Industries Inc.'s Wing Nuts or Wire Nuts.
 - b. Rated 150° C, 600V; Ideal Industries Inc.'s High Temperature Wire-Nut Model 73B, 59B.
 2. Indent Type with Insulating Jacket: Rated 105° C, 600V; Buchanan/Ideal Industries Inc.'s Crimp Connectors, Ideal Industries Inc.'s Crimp Connectors, Penn-Union Corp.'s Penn-Crimps, or Thomas & Betts Corp.'s STA-KON.
 3. Indent Type (Uninsulated): Anderson/Hubbell's Versa-Crimp, VERSAtile, Blackburn/T&B Corp.'s Color-Coded Compression Connectors, Electrical Products Div./3M's Scotchlok 10000, 11000 Series, Framatome Connectors/Burndy's Hydent, Penn-Union Corp.'s BCU, BBCU Series, or Thomas & Betts Corp.'s Compression Connectors.
 4. Connector Blocks: NIS Industries Inc.'s Polaris System, or Thomas & Betts Corp.'s Blackburn AMT Series.
 5. Resin Splice Kits: Electrical Products Div./3M's Scotchcast Brand Kit Nos. 82A Series, 82-B1 or 90-B1, or Scotchcast Brand Resin Pressure Splicing Method.
 6. Heat Shrinkable Splices: Electrical Products Div./3M's ITCSN, Raychem Corp.'s Thermofit Type WCS, or Thomas & Betts Corp.'s SHRINK-KON Insulators.
 7. Cold Shrink Splices: Electrical Products Div./3M's 8420 Series.
- C. Gutter Taps: Anderson/Hubbell's GP/GT with GTC Series Covers, Blackburn/T&B Corp.'s H-Tap Type CF with Type C Covers, Framatome Connectors/Burndy's Polytap KPU-AC, H-Crimp Type YH with CF-FR Series Covers, ILSCO's GTA Series with GTC Series Covers, Ideal Industries Inc.'s Power-Connect GP, GT Series with GIC covers, NSI Industries Inc.'s Polaris System, OZ/Gedney Co.'s PMX or PT with PMXC, PTC Covers, Penn-Union Corp.'s CDT Series, or Thomas & Betts Corp.'s Color-Keyed H Tap CHT with HTC Covers.
- D. Terminals: Nylon insulated pressure terminal connectors by Amp-Tyco/Electronics, Electrical Products Div./3M, Framatome Connectors/Burndy, Ideal Industries Inc., Panduit Corp., Penn-Union Corp., Thomas & Betts Corp., or Wiremold Co.
- E. Lugs:
1. Single Cable (Compression Type Lugs): Copper, 1 or 2 hole style (to suit conditions), long barrel; Anderson/Hubbell's VERSAtile VHCL, Blackburn/T&B Corp.'s Color-Coded CTL, LCN, Framatome Connectors/Burndy's Hylug YA, Electrical Products Div./3M Scotchlok 31036 or 31145 Series, Ideal Industries Inc.'s CCB or CCBL, NSI

- Industries Inc.'s L, LN Series, Penn-Union Corp.'s BBLU Series, or Thomas & Betts Corp.'s 54930BE or 54850BE Series.
- 2. Single Cable (Mechanical Type Lugs): Copper, one or 2 hole style (to suit conditions); Blackburn/T&B Corp.'s Color-Keyed Locktite Series, Framatome Connectors/Burndy's Qiklug Series, NSI Industries Inc.'s Type TL, Penn-Union Corp.'s VI-TITE Terminal Lug Series, or Thomas & Betts Corp.'s Locktite Series.
- 3. Multiple Cable (Mechanical Type Lugs): Copper, configuration to suit conditions; Framatome Connectors/Burndy's Qiklug Series, NSI Industries Inc.'s Type TL, Penn-Union Corp.'s VI-TITE Terminal Lug Series, or Thomas & Betts Corp.'s Color-Keyed Locktite Series.

2.03 TAPES

- A. Insulation Tapes:
 - 1. Plastic Tape: Electrical Products Div./3M's Scotch Super 33+ or Scotch 88, Plymouth Rubber Co.'s Plymouth/ Bishop Premium 85CW.
 - 2. Rubber Tape: Electrical Products Div./3M's Scotch 130C, or Plymouth Rubber Co.'s Plymouth/Bishop W963 Plysafe.
- B. Moisture Sealing Tape: Electrical Products Div./3M's Scotch 2200 or 2210, or Plymouth Rubber Co.'s Plymouth/Bishop 4000 Plyseal-V.
- C. Electrical Filler Tape: Electrical Products Div./3M's Scotchfil, or Plymouth Rubber Co.'s Plymouth/Bishop 125 Electrical Filler Tape.
- D. Color Coding Tape: Electrical Products Div./3M's Scotch 35, or Plymouth Rubber Co.'s Plymouth/Bishop Premium 37 Color Coding.
- E. Arc Proofing Tapes:
 - 1. Arc Proofing Tape: Electrical Products Div./3M's Scotch 77, Mac Products Inc.'s AP Series, or Plymouth Rubber Co.'s Plymouth/Bishop 53 Plyarc.
 - 2. Glass Cloth Tape: Electrical Products Div./3M's Scotch 27/Scotch 69, Mac Products Inc.'s TAPGLA 5066,, or Plymouth Rubber Co.'s Plymouth/Bishop 77 Plyglas.
 - 3. Glass-Fiber Cord: Mac Products Inc.'s MAC 0527.

2.04 WIRE-PULLING COMPOUNDS

- A. To suit type of insulation; American Polywater Corp.'s Polywater Series, Electric Products Div./3M's WL, WLX, or WLW, Greenlee Textron Inc.'s Y-ER-EAS, Cable Cream, Cable Gel, Winter Gel, Ideal Industries Inc.'s Yellow 77, Aqua-Gel II, Agua-Gel CW, or Thomas & Betts Corp.'s Series 15-230 Cable Pulling Lubricants, or Series 15-631 Wire Slick.

2.05 TAGS

- A. Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
- B. Phenolic: Two color laminated engraver's stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
- C. Aluminum: Standard aluminum alloy plate stock, minimum .032 inch thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.

2.06 WIRE MANAGEMENT PRODUCTS

- A. Cable Clamps and Clips, Cable Ties, Spiral Wraps, etc: Catamount/T&B Corp., or Ideal Industries Inc.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install conductors in raceways after the raceway system is completed.
Exceptions: Type TC, MI, or other type specifically indicated on the drawings not to be installed in raceways.
- B. No grease, oil, or lubricant other than wire-pulling compounds specified may be used to facilitate the installation of conductors. Completely and thoroughly swab raceway/wire before installing wire/cable.
- C. All splices and connections shall be made in accessible boxes and cabinets only.

3.02 CIRCUITING

- A. Wiring and cables of different systems shall not be run in same raceway. Power wiring shall not be run in same raceway for remote control/signal wiring.
- B. Class 2, 3 plenum rated cables shall be run without raceway when concealed above accessible ceilings unless otherwise indicated on Contract Drawings. These cables shall be run parallel and perpendicular to building surfaces, and shall be neatly bundled and shall be supported independently from the accessible ceiling utilizing bridle rings or similar. Cables shall effectively be routed horizontal. Provide conduit sleeves at wall penetrations.

3.03 COMMON NEUTRAL CONDUCTOR

- A. A common neutral shall not be used. Provide individual neutral per each circuit.

3.04 COLOR CODING

- A. Color Coding for 120/208/240 Volt Electric Light and Power Wiring:
1. Color Code:
 - a. 2 wire circuit - black, white.
 - b. 3 wire circuit - black, red, white.
 - c. 4 wire circuit - black, red, blue, white.
 2. White to be used only for an insulated grounded conductor (neutral). If neutral is not required use black and red, or black, red and blue for phase to phase circuits.
 - a. "White" for Sizes No. 6 AWG or Smaller:
 - 1) Continuous white outer finish, or:
 - 2) Three continuous white stripes on other than green insulation along its continuous length.
 - b. "White" for Sizes Larger Than No. 6 AWG:
 - 1) Continuous white outer finish, or:
 - 2) Three continuous white stripes on other than green insulation along its continuous length, or:
 - 3) Distinctive white markings (color coding tape) encircling the conductor, installed on the conductor at time of its installation. Install white color coding tape at terminations, and at 1' 0" intervals in gutters, pull boxes, and manholes.
 3. Colors (Black, Red, Blue):
 - a. For Branch Circuits: Continuous color outer finish.
 - b. For Feeders:
 - 1) Continuous color outer finish, or:
 - 2) Color coding tapes encircling the conductors, installed on the conductors at time of their installation. Install color coding tapes at terminations, and at 1' 0" intervals in gutter, pull boxes, and manholes.
- B. More Than One Nominal Voltage System Within A building: Permanently post the color coding scheme at each branch-circuit panelboard.
- C. Existing Color Coding Scheme: Where an existing color coding scheme is in use, match the existing color coding if it is in accordance with the requirements of NFPA 70.
- D. Color Code For Wiring Other Than Light and Power: In accordance with ICEA/NEMA WC-30 "Color Coding of Wires and Cables". Other coding methods may be used, as approved.
- E. On 3-phase, 4-wire delta system, high leg shall be orange, as required by NFPA 70.

3.05 IDENTIFICATION

- A. Identification Tags: Use tags to identify feeders and designated circuits. Install tags so that they are easily read without moving adjacent feeders or requiring removal of arc proofing tapes. Attach tags with non-ferrous wire or brass chain.
 - 1. Interior Feeders: Identify each feeder in pull boxes and gutters. Identify by feeder number and size.
 - 2. Exterior Feeders: Identify each feeder in manholes and in interior pull boxes and gutters. Identify by feeder number and size, and also indicate building number and panel designation from which feeder originates.
 - 3. Street and Grounds Lighting Circuits: Identify each circuit in manholes and lighting standard bases. Identify by circuit number and size, and also indicate building number and panel designation from which circuit originates.
- B. Identification Plaque: Where a building or structure is supplied by more than one service, or has any combination of feeders, branch circuits, or services passing through it, install a permanent plaque or directory at each service, feeder and branch circuit disconnect location denoting all other services, feeders, or branch circuits supplying that building or structure or passing through that building or structure and the area served by each.
- C. All control conductors as specified herein shall be labeled at each termination point. Labeling shall be permanently labeled with printed Brady type labels or equivalent.

3.06 WIRE MANAGEMENT

- A. Use wire management products to bundle, route, and support wiring in junction boxes, pull boxes, wireways, gutters, channels, and other locations where wiring is accessible.

3.07 EQUIPMENT GROUNDING CONDUCTOR

- A. Install Equipment Grounding Conductor:
 - 1. Where specified in other Sections or indicated on the Contract Drawings.
 - 2. In conjunction with circuits recommended by equipment manufacturers to have equipment grounding conductor.
- B. Equipment grounding conductor is not intended as a current carrying conductor under normal operating circumstances.
- C. Color Coding For Equipment Grounding Conductor:
 - 1. Color Code: Green.
 - 2. "Green" For sizes No. 6 AWG or Smaller:
 - a. Continuous green outer finish, or:
 - b. Continuous green outer finish with one or more yellow stripes, or:

- c. Bare copper (see exception below). “Green” For Sizes Larger Than No. 6:
 - d. Stripping the insulation or covering from the entire exposed length (see exception below).
 - e. Marking the exposed insulation or covering with green color coding tapes.
 - f. Identify at each end and at every point where the equipment grounding conductor is accessible.
3. Exception For use of Bare Copper: Not allowed for use where NFPA 70 specifically requires equipment grounding conductor to be insulated, or where specified in other sections or indicated on the drawings to be insulated.

3.08 SPECIAL GROUNDING CONDUCTORS

- A. Technical Power System Grounding (Equipment grounding conductor isolated from the premises grounded conductor except at a single grounded termination point): Install an insulated grounding conductor running with the circuit conductors for isolated receptacles or utilization equipment requiring an isolated ground.
- 1. Color Code: Green.
 - 2. “Green” For Isolated Grounding Conductor:
 - a. Continuous green outer finish, or:
 - b. Continuous green outer finish with one or more yellow stripes, and:
 - c. Different than the “green” used for the equipment grounding conductor run with the circuit (where required).
 - 3. Install label at every point where the conductor is accessible, identifying it as an “Isolated Grounding Conductor”.

3.09 ARC PROOFING

- A. Arc proof 600V and under cables only where routed in a manhole/handhole that also contains medium voltage cable/feeders as follows:
- 1. Arc proof new 600V and under cables.
 - 2. Arc proof existing 600V and under cables that are spliced to new 600V and under cables.
 - 3. Arc proof each 600V and under cable as a unit (except cables consisting of multiple sets of conductors).
 - 4. Arc proof 600V and under cables consisting of multiple sets of conductors by arc proofing each set of conductors as a unit.
 - 5. Arc proof with half-lapped layer of 55 mils thick arc proofing tape and random wrapped or laced with glass cloth tape or glass-fiber cord. For arc proofing tape less than 55 mils thick, add layers to equivalent of 55 mils thick arc proofing tape.

3.10 INSULATED CONDUCTOR AND CABLE SCHEDULE - TYPES AND USE

- A. Electric Light and Power Circuits:
 - 1. FEP, THHN, THW, THW-2, THWN, THWN-2, XHH, XHHW, or XHHW-2: Wiring in dry or damp locations (except where special type insulation is required).
 - 2. THWN, THWN-2, XHHW, XHHW-2, USE, or USE-2: Wiring in wet locations (except where type USE or USE-2 insulated conductors are specifically required, or special type insulation is required).
 - 3. THHN, THWN or THWN-2: Wiring installed in existing raceway systems (except where special type insulation is required).
 - 4. THHN, THW-2, THWN-2, XHHW, or XHHW-2: Wiring for electric discharge lighting circuits (fluorescent, HID), except where fixture listing requires wiring rated higher than 90° C.
 - 5. THWN Marked "Gasoline and Oil Resistant": Wiring to gasoline and fuel oil pumps.
 - 6. USE, or USE-2: Wiring indicated on the drawings to be direct burial in earth.
 - 7. USE, or USE-2 Marked "Sunlight Resistant":
 - a. Service entrance wiring from overhead service to the service equipment.
 - b. Wiring exposed to the weather and unprotected (except where special type insulation is required).
- B. Emergency Feeder Circuits: Use electrical circuit protective system.
- C. Class 1 Circuits: Use Class 1 wiring specified in Part 2 (except where special type insulation is required).
- D. Class 2 Circuits: Use Class 2 wiring specified in Part 2 (except where special type insulation is required).
- E. Class 3 Circuits: Use Class 3 wiring specified in Part 2 (except where special type insulation is required).
- F. Control Wiring: Provide conductors rated for outdoor installation when exterior to buildings.

3.11 CONNECTOR SCHEDULE - TYPES AND USE

- A. Temperature Rating: Use connectors that have a temperature rating, equal to, or greater than the temperature rating of the conductors to which they are connected.
- B. Splices:
 - 1. Dry Locations:
 - a. For Conductors No. 8 AWG or Smaller: Use spring type pressure connectors, indent type pressure connectors with insulating jackets,

or connector blocks (except where special type splices are required).

- b. For Conductors No. 6 AWG or Larger: Use connector blocks or uninsulated indent type pressure connectors. Fill indentions in uninsulated connectors with electrical filler tape and apply insulation tape to insulation equivalent of the conductor, or insulate with heat shrinkable splices or cold shrink splices.
- c. Gutter Taps in Panelboards: For uninsulated type gutter taps fill indentions with electrical filler tape and apply insulation tape to insulation equivalent of the conductor, or insulate with gutter tap cover.
- 2. Damp Locations: As specified for dry locations, except apply moisture sealing tape over the entire insulated connection (moisture sealing tape not required if heat shrinkable splices or cold shrink splices are used).
- 3. Wet Locations: Use uninsulated indent type pressure connectors and insulate with resin splice kits, cold shrink splices or heat shrinkable splices. Exception: Splices aboveground which are totally enclosed and protected in NEMA 3R, 4, 4X enclosures may be spliced as specified for damp locations.

C. Terminations:

- 1. For Conductors No. 10 AWG or Smaller: Use terminals for:
 - a. Connecting wiring to equipment designed for use with terminals.
- 2. For Conductors No. 8 AWG or Larger: Use compression or mechanical type lugs for:
 - a. Connecting cables to flat bus bars.
 - b. Connecting cables to equipment designed for use with lugs.
- 3. For Conductor Sizes Larger Than Terminal Capacity On Equipment: Reduce the larger conductor to the maximum conductor size that terminal can accommodate (reduced section not longer than one foot). Use compression or mechanical type connectors suitable for reducing connection.

3.12 TESTING

- A. Insulation Resistance Tests: Make tests after all wiring is completed and connected ready for the attachment of fixture and/or equipment. Repeat test when all fixtures and/or equipment are connected ready for use. Make tests with an instrument capable of measuring the resistance involved at a voltage of at least 500 VDC for equipment rated at 100 to 500 VAC, 1500 VDC for equipment rated at 151 to 600 VAC. Apply voltage continuously for one minute prior to taking reading. Measure insulation resistance between each pair of insulated conductor separately and between each insulated conductor and ground. Make tests at each panelboard distribution panel, and switchboard on every circuit with the circuit protective device open but connected. The minimum acceptable measured insulation resistance for wiring completed and ready for connection of fixtures and/or equipment is 50 meg ohms.

END OF SECTION

SECTION 26 05 26

GROUNDING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Grounding and bonding of electrical installations as shown on the Plans, as specified and/or directed.
- B. Existing site conditions may necessitate use of alternative grounding systems to achieve required ohm values. Existing site conditions are to include minimum soil cover over bedrock and exposed bedrock.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. American National Standards Institute (ANSI), Electronic Industries Alliance (EIA), Telecommunications Industry Association (TIA)
Publication: (ANSI/EIA/TIA)
 - a. 607 - Commercial Building Grounding and Bonding Requirements for Telecommunications
 - 2. Institute of Electrical and Electronics Engineers (IEEE) Publications:
 - a. 81 - Guide for Measuring Earth Receptivity, Ground Impedance and Earth Surface Potential of a Ground System
 - b. 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems
 - c. 1100 - Recommended Practice for Powering and Grounding Sensitive Electronic Equipment
 - 3. National Fire Protection Association (NFPA) Publication:
 - a. 70 - National Electrical Code (NEC)
 - 4. Underwriters Laboratories, Inc. (UL) Publications:
 - a. 83 - Thermoplastic-Insulated Wires and Cables
 - b. 44 - Rubber-Insulated Wires and Cables
 - c. 467 - Grounding and Bonding Equipment

1.03 SUBMITTALS

- A. Product Data. Provide data for grounding electrodes and connectors.
- B. Test Reports: Indicate overall resistance to ground.

- C. Manufacturer's Instructions: Include instructions for preparation, installation and examination of exothermic connectors, as applicable.
- D. Certifications: Two weeks prior to final inspection, deliver to the Owner's designated representative four copies of the certification that the material and installation is in accordance with the drawings and specifications and has been properly installed.

PART 2 - PRODUCTS

2.01 GROUNDING WIRES

- A. General Purpose: UL and NEC approved types, copper, with TW, THW, XHHW or dual rated THHN-THWN insulation color identified green.
- B. Isolated Power System: Type XHHW insulation with a dielectric constant of 3.5 or less.
- C. Size wire not less than what is shown and not less than required by the NEC.
- D. Stranded bare copper ground conductor where indicated on drawings.

2.02 GROUND RODS

- A. Copper clad steel, 3/4-inch diameter by 10 feet long.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Ground as shown and as hereinafter specified in accordance with the NEC.
- B. System Grounding:
 - 1. Ground the electrical service system neutral at service entrance equipment to grounding electrodes. Concrete encased electrodes shall be connected as the most effective grounding electrodes. Provide a completely grounded system in accordance with Article 250 of the NEC.
 - 2. Ground each separately-derived system neutral to separate grounding electrode system. Transformer, UPS systems, power conditioners, inverters, or other power supplies are separately derived systems. Standby or emergency generators are separately derived systems if the neutral is bonded to the generator frame and if there is no direct connection of the generator neutral conductor to the service neutral conductor.
 - 3. Provide communications system grounding conductor connected to separate electrode (ground bus) that is shall be installed in each IT room. Bond together system neutrals, service equipment enclosures, exposed

non-current carrying metal parts of electrical equipment, metal raceway systems, cable trays, auxiliary gutters, meter fittings, boxes, cable armor, cable sheath, ground bus in electrical rooms and IT rooms, metal frame of the building or structure, ground ring, lightning down lead conductor, grounding conductor in raceways and cables, receptacle ground connectors, and metal underground water pipe. Bonding jumpers shall be installed around non-metal fittings or insulating joints to ensure electrical continuity. Bonding shall be provided where necessary to ensure electrical continuity and the capacity to conduct safely any fault current likely to be imposed.

4. Secondary service neutrals ground at the supply side of the secondary disconnecting means and at the related transformers.
5. Separately derived systems (transformers downstream from the service entrance) ground the secondary neutral.
6. Isolation transformers and isolated power systems shall not be system grounded.

C. Equipment Grounding:

1. Metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, and other conductive items in close proximity with electrical circuits shall be grounded for personnel safety and to provide a low impedance path for possible ground fault currents.

3.02 PRIMARY EQUIPMENT AND CIRCUITS

- A. Switchgear: Provide a bare grounding electrode conductor from the switchgear ground bus to a grounding electrode system, metal underground water pipe and driven ground rods for the grounding electrode. Where a new foundation/footer is constructed for a building/structure the grounding electrode system shall also be bonded to the concrete-encased electrode (reinforcing steel in foundation/footer). Coordinate with General Contractor.
- B. Duct Banks and Manholes:
1. Provide a bare equipment grounding conductor in each duct bank containing medium or high voltage cables. Connect the grounding conductors to the switchgear ground bus, to all manhole hardware, to the cable shielding of medium or high voltage cable splices and terminations, and equipment enclosures.
 2. Provide a grounding conductor having at least 50 percent ampacity of the largest phase conductor in the duct bank.
 3. Connect the equipment grounding conductor to the ground rod.
- C. Outdoor Fences: Connect outdoor fences around electrical equipment to the grounding electrode system.
- D. Metallic Conduit: Metallic conduits which terminate without mechanical connection to a housing of electrical equipment by means of locknut and bushings

or adapters, provided with grounding bushings. Connect bushings with a bare grounding conductor to the equipment ground bus.

- E. Lightning Arresters: Connect lightning arrester grounds to the equipment ground bus, or ground rods as applicable.

3.03 SECONDARY EQUIPMENT AND CIRCUITS

- A. Main Bonding Jumper: Connect the secondary service neutral to the ground bus in the service equipment.
- B. Water Pipe and Supplemental Electrode:
 - 1. Provide a ground conductor connection between the service equipment ground bus and the metallic water pipe system. Jumper insulating joints/meter in the water pipe.
 - 2. Provide a supplemental ground electrode and bond to the water pipe ground, or connect to the service equipment ground bus.
 - 3. Where a new foundation/footer is constructed for a building/structure, the grounding electrode system shall also be bonded to the concrete-encased electrode (reinforcing steel in foundation/ footer). Coordinate with General Contractor.
- C. Service Disconnect (Separate Individual Enclosure): Provide a ground bar bolted to the enclosure with lugs for connecting the various grounding conductors.
- D. Switchgear and Switchboards:
 - 1. Connect the various feeder green grounding conductors to the ground bus in the enclosure with suitable pressure connectors.
 - 2. Connect the grounding electrode conductor to the ground bus.
 - 3. Connect the neutral to the ground bus (main bonding jumper).
 - 4. Connect metallic conduits, which terminate without mechanical connection to the housing, by grounding bushings and ground wire to the ground bus.
- E. Conduit Systems:
 - 1. Ground all metallic conduit systems.
 - 2. Non-metallic conduit systems shall contain a grounding conductor.
 - 3. Conduit provided for mechanical protection containing only a grounding conductor, bond to that conductor at the entrance and exit from the conduit.
- F. Feeders and Branch Circuits: Install green grounding conductors with feeders and branch circuits as follows:
 - 1. Feeders.
 - 2. Branch Circuits.
 - 3. Receptacle Outlets.
 - 4. Directly Connected Equipment, Appliances and Devices.
 - 5. Motors and Motor Controllers.

6. Fixed Equipment and Appurtenances.
 7. Items of equipment where the final connection is made with flexible metal conduit shall have a grounding wire.
 8. Additional locations and systems as shown.
- G. Boxes, Cabinets, Enclosures and Panelboards:
1. Bond the grounding wires to each pull box, junction box, outlet box, cabinets, and other enclosures through which the ground wires pass.
 2. Provide lugs in each box and enclosure for ground wire termination.
 3. Provide ground bars in panelboards, bolted to the housing, with sufficient lugs for terminating the ground wires.
- H. Motors and Starters:
1. Provide lugs in motor terminal box and starter housing for ground wire termination.
 2. Make ground wire connections to ground bus in motor control centers.
- I. Receptacles are not approved for grounding through their mounting screws. Ground with a ground wire from green ground terminal on the receptacle to the outlet box ground screw.
- J. Ground lighting fixtures to the green grounding conductor of the wiring system. During renovation, provide the green ground if it is not part of the system, or ground the fixtures through the conduit systems per means acceptable under the NEC. Fixtures connected with flexible conduit shall have a green ground wire included with the power wires from the fixture through the flexible conduit to the first outlet box.
- K. Fixed electrical appliances and equipment shall have a ground lug installed for termination of the green ground conductor.

3.04 CONDUCTIVE PIPING

- A. Bond all conductive piping systems in the building to the electrical system ground. Bonding connections shall be made as close as practical to the water pipe ground or service equipment ground bus.

3.05 GROUND RESISTANCE

- A. Grounding system ground resistance must comply with NEC. Provide additional ground rods as required until resistance reading is compliant with NEC.
- B. Services at power company interface points shall comply with the power company ground resistance requirements.
- C. Make necessary modifications to the ground electrodes for compliance that is needed without additional cost to the Owner, including the provisions of a multi-rod system.

3.06 GROUND ROD INSTALLATION

- A. Drive each rod vertically in the earth for not less than ten feet in depth.
- B. Where permanently concealed ground connections are required, make the connections by the exothermic process to form solid metal joints. Make accessible ground connections with mechanical pressure type ground connectors.
- C. Where rock prevents the driving of vertical ground rods, install grounding electrodes in horizontal trenches to achieve the specified resistance.
- D. In manhole, install ground rods with 4 to 6 inches above the floor with connections of grounding conductors fully visible and accessible.

END OF SECTION

SECTION 26 05 34

CONDUIT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Conduit as shown on the Plans, as specified, and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. American National Standards Institute (ANSI) Publications:
 - a. C80.1 - Rigid Steel Conduit, Zinc Coated
 - b. C80.3 - Electrical Metallic Tubing, Zinc Coated
 - c. C80.5 - Rigid Aluminum Conduit
 - 2. National Electrical Manufacturers Association (NEMA) Publications:
 - a. FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies
 - b. RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
 - c. TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
 - d. TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing
 - 3. National Electrical Contractors Association (NECA) Publication:
 - a. Standard of Installation

1.03 SECTION INCLUDES

- A. Rigid steel conduit.
- B. PVC coated rigid steel conduit.
- C. Flexible metal conduit.
- D. Liquid-tight flexible metal conduit.
- E. Electrical metallic tubing.
- F. Nonmetallic conduit.
- G. Flexible nonmetallic conduit.

H. Electrical nonmetallic tubing.

I. Fittings and conduit bodies.

1.04 RELATED SECTIONS

A. Section 26 05 01, "Electrical General Requirements", applies to this Section with additions and modifications specified herein.

1.05 SUBMITTALS

A. Conduit and fittings (each type).

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

B. Protect PVC conduit from sunlight.

1.07 PROJECT CONDITIONS

A. Verify that field measurements are as shown on the Contract Drawings.

B. Field verify all conduit routing and coordinate proposed conduit routing with all existing equipment, structure features, proposed equipment locations for equipment furnished by this Contractor and all other Contractors, Owner furnished equipment, etc. prior to rough-in.

C. Conduit routing, when shown on the Contract Drawings, are in approximate locations unless dimensioned. Route as required to complete wiring system.

D. Plans (drawings) are diagrammatic and show only approximate locations of equipment, fixtures, devices, etc. Plans may not show exact quantity and locations of junction and pull boxes required for a complete installation. Exact locations and routing of conduit shall be determined in the field and shall suit the job conditions. Quantities and locations of outlet, junction, and pull boxes shall be provided to suit the installed arrangement and meet all NEC and local code requirements.

1.08 QUALITY ASSURANCE

A. In each standard referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" has been substituted for "should" wherever it appears.

B. Verify routing and termination locations of conduit prior to rough-in.

- C. Conduit routing when shown on the Contract Drawings are in approximate locations unless dimensioned. Route as required to complete wiring system.

1.09 QUALITY ASSURANCE

- A. In each standard referred to herein, consider the advisory provisions to be mandatory, as though the word “shall” has been substituted for “should” wherever it appears.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials, equipment, and devices shall, as a minimum, meet requirements of UL, where UL standards are established for these items, and requirements of NFPA 70.
- B. Provide conduit types in specific installations as scheduled on Contract Drawings. Specific conduit material and installation specifications for the scheduled conduit type are specified herein.

2.02 CONDUIT AND FITTINGS

- A. Rigid Steel Conduit (Zinc-coated): ANSI C80.1, UL 6.
- B. Rigid Aluminum Conduit: ANSI C80.5, UL 6.
- C. Rigid Nonmetallic Conduit: UL 651, UL 1684
 - 1. PVC Type EPC-40 and EPC-80, in accordance with NEMA TC2.
 - 2. Fiberglass conduit in accordance with NEMA TC14.
- D. Intermediate Metal Conduit (IMC): UL 1242, zinc-coated steel only.
- E. Electrical Metallic Tubing (EMT): UL 797, ANSI C80.3.
- F. Electrical Nonmetallic Tubing (ENT): NEMA TC13.
- G. Plastic-coated Rigid Steel and IMC Conduit: NEMA RN1, Type 40 (40 mils thick).
- H. Flexible Metal Conduit: UL 1.
 - 1. Liquid-tight Flexible Metal Conduit, Steel: UL 360.
- I. Fittings for Metal Conduit, EMT, and Flexible Metal Conduit: UL 514B. Ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514B. Fittings shall match conduit type and material.

1. Fittings for Rigid Metal Conduit and IMC: Threaded-type. Split couplings unacceptable.
 2. Fittings for EMT: set screw type.
 3. Fittings for Use in Hazardous Locations: UL 886.
- J. Fittings for Rigid Nonmetallic Conduit: NEMA TC3. Fittings shall match conduit type and material.

2.03 FIBER OPTIC SYSTEMS

- A. For conduit systems that are intended for the installation of fiber optic cables, all conduit bends radii shall meet or exceed minimum radius in accordance with installed fiber optic bending limitation specifications.
- B. Where conduit bodies are used in 90 degree sections of conduit runs, only "Optical LB", or equivalent shall be used.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Electrical installations shall conform to requirements of NFPA 70 and to requirements specified herein.
- B. Hazardous Locations: Work in hazardous locations, as defined by NFPA 70, shall be performed in strict accordance with NFPA 70 for particular "Class", "Division", and "Group" of hazardous locations involved. Provide conduit and cable seals where required by NFPA 70. Conduit shall have tapered threads.
- C. Service Entrance Identification: Service entrance disconnect devices, switches, or enclosures shall be labeled or identified as such.
1. Labels: Wherever work results in service entrance disconnect devices in more than one enclosure, as permitted by NFPA 70, each enclosure, new and existing, shall be labeled as one of several enclosures containing service entrance disconnect devices. Label, at minimum, shall indicate number of service disconnect devices housed by enclosure and shall indicate total number of enclosures that contain service disconnect devices. Provide laminated plastic labels. Use lettering of at least 0.25 inch in height, and engrave on black-on-white matte finish. Service entrance disconnect devices in more than one enclosure shall be provided only as permitted by NFPA 70.
- D. Wiring Methods: Provide insulated conductors installed in conduit, except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Provide insulated, green equipment grounding conductor in feeder and branch circuits, including lighting circuits. Grounding conductor shall

be separate from electrical system neutral conductor. Provide insulated, green conductor for grounding conductors installed in conduit or raceways. Minimum conduit size shall be 1/2 inch in diameter for low voltage lighting and power circuits. Vertical distribution in multiple story buildings shall be made with metal conduit in fire-rated shafts. Metal conduit shall extend through shafts for minimum distance of 6 inches. Conduit which penetrates fire walls, fire partitions, or floors shall be metallic on both sides of fire walls, fire partitions, or floors for minimum distance of 6 inches.

1. Aluminum Conduit: Do not install underground or encase in concrete. Do not use brass or bronze fittings.
2. Restrictions Applicable to EMT:
 - a. Do not install underground.
 - b. Do not encase in concrete.
 - c. Do not use in areas subject to severe physical damage.
 - d. Do not use in hazardous areas.
 - e. Do not use outdoors.
3. Nonmetallic Conduit: Conduit shall not penetrate fire walls, fire partitions, or floors.
4. ENT: ENT may be provided in walls, floors, and ceilings only when protected by thermal barriers identified as having minimum 15-minute finish rating. If ENT is used, provide required thermal barriers, whether indicated or not.
 - a. Following restrictions apply to ENT:
 - b. Do not route exposed.
 - c. Do not route above suspended ceilings (i.e., between suspended ceilings and permanent ceilings).
 - d. Do not use in feeder circuits.
 - e. Do not install underground.
 - f. Do not encase in concrete.
 - g. Do not use in areas subject to severe physical damage including, but not limited to, mechanical equipment rooms, electrical equipment rooms, hospitals, power plants, missile magazines, and other such areas.
 - h. Do not use in hazardous areas.
 - i. Do not use outdoors.
 - j. Do not use in sizes larger than 2 inches.
 - k. Do not use in penetrating fire rated walls, partitions, etc.
5. Restrictions applicable to PVC Schedule 40 and PVC Schedule 80.
 - a. Do not use in feeder circuits unless otherwise indicated.
 - b. Do not use in areas subject to severe physical damage including, but not limited to, mechanical equipment rooms, electrical equipment rooms, hospitals, power plants, missile magazines, and other such areas.
 - c. Do not use in hazardous areas.
 - d. Do not use in penetrating fire-rated walls or partitions, fire rated floors, etc.

6. Service Entrance Conduit, Overhead: Rigid steel or IMC from service entrance to service entrance fitting or weatherhead outside building.
 7. Service Entrance Conduit, Underground: Galvanized rigid steel or steel IMC. Underground portion shall be encased in minimum of 3 inches of concrete and shall be installed minimum 18 inches below slab or grade.
 8. Underground Conduit Other Than Service Entrance: Plastic-coated rigid steel; plastic-coated steel IMC; PVC, Type EPC-40; or fiberglass. Convert nonmetallic conduit, other than PVC Schedule 40 or 80, to plastic-coated rigid, or IMC, steel conduit before rising through floor slab; plastic coating shall extend minimum 6 inches above floor.
 9. Conduit in Floor Slabs: Rigid steel; steel IMC; fiberglass, or PVC, Type EPC-40.
 10. Conduit Interior to Buildings for 400 Hz Circuits: Aluminum or nonmetallic. Where 400-Hz circuit runs underground or through concrete, conduit shall be PVC Schedule 80.
 11. Conduit for Circuits Rated Greater Than 600 Volts: Rigid metal conduit or IMC only.
- E. Conduit Installation: Unless indicated otherwise, conceal conduit within finished walls (existing or proposed), above ceilings, below floors or within floor slabs. With written approval by the Owner's Designated Representative where conduit cannot physically be installed concealed, install decorative surface metal raceway as manufactured by Wiremold Series 2400, or approved equal.
1. For new conduit runs in existing locations, Contractor to field verify all proposed locations prior to installation. Installation of conduit shall be located and installed:
 - a. So as to not interfere with existing utilization equipment.
 - b. Not in front of intake/exhaust fans and louvers.
 - c. Not in front of access panels.
 - d. Not in front of doors or windows.
 - e. In a location that does not allow maintenance and clearance to existing and proposed mechanical and electrical equipment
 - f. Not on floor or at a height above floor so as to be a tripping hazard,
 - g. Not installed in dedicated space that would limit an overhead cranes or similar lifting device's ability to remove intended equipment below. This includes but is not limited to access hatches, crane trucks, crane hoists, movement along crane rails, jib crane full swinging arc/areas, etc.
 2. Contractor to notify Owner and Owners Designated Representative of all potential conduit installation conflicts with existing equipment, HVAC, plumbing, building or structural systems prior to field construction of conduit systems.
- F. Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.

1. Conduit Through Floor Slabs: Where conduits rise through floor slabs, curved portion of bends shall not be visible above finish slab.
2. Conduit Support: Support conduit by pipe straps, wall brackets, hangers, or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; and by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. Load applied to fasteners shall not exceed one-fourth proof test load. Fasteners attached to concrete ceiling shall be vibration- resistant and shock-resistant. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete joints shall not cut main reinforcing bars. Fill unused holes. In partitions of light steel construction, use sheet metal screws. In suspended- ceiling construction, run conduit above ceiling. Do not support conduit by ceiling support system. Spring-steel fasteners may be used for lighting branch circuit conduit supports in suspended ceilings in dry locations. Support exposed risers in wire shafts of multi-story buildings by U-clamp hangers at each floor level and at 10-foot maximum intervals. Where conduit crosses building expansion joints, provide suitable watertight expansion fitting that maintains conduit electrical continuity by bonding jumpers or other means. Support raceways within three (3) feet of each outlet box, junction box, cabinet or enclosure.
3. Directional Changes in Conduit Runs: Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of obstructions.
4. Pull Wire: Install pull wires in empty conduits in which wire is to be installed by others. Pull wire shall be plastic having minimum 200-pound tensile strength. Leave minimum 12 inches of slack at each end of pull wire.
5. Telephone and Signal System Conduits: Install in accordance with specified requirements for conduit and with additional requirement that no length of run shall exceed 150 feet for trade sizes 2 inches and smaller and shall not contain more than two 90-degree bends or equivalent. Provide pull or junction boxes where necessary to comply with these requirements. Inside radii of bends in conduits 1-inch trade size and larger shall be minimum five times nominal diameter. Terminate conduit in terminal cabinet with two locknuts and plastic bushing.
6. Conduit Installed in Concrete Floor Slabs: Locate so as not to adversely affect structural strength of slabs. Install conduit within middle 1/3 of concrete slab. Space conduits horizontally minimum three diameters, except at cabinet locations. Curved portions of bends shall not be visible above finish slab. Increase slab thickness as necessary to provide

minimum 1-inch cover over conduit. Where embedded conduits cross expansion joints, provide suitable watertight expansion fittings and bonding jumpers. Conduit larger than 1-inch trade size shall be parallel with or at right angles to main reinforcement; when at right angles to reinforcement, conduit shall be close to one of supports of slab. Where nonmetallic conduit is used, raceway must be converted to rigid steel or steel IMC before rising above floor, unless specifically indicated otherwise.

7. Locknuts and Bushings: Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use minimum single locknut and bushing. Locknuts shall have sharp edges for digging into wall of metal enclosures. Install bushings on ends of conduits, and provide insulating type where required by NFPA 70.
8. Stub-ups: Provide conduits stubbed up through concrete floor for connection to free-standing equipment with adjustable top or coupling threaded inside for plugs, set flush with finished floor. Extend conductors to equipment in rigid steel conduit, except that flexible metal conduit may be used 6 inches above floor. Where no equipment connections are made, install screwdriver-operated threaded flush plugs in conduit end.
9. Flexible Connections: Provide flexible connections of short length, 6-foot maximum, for recessed and semi-recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for motors. Provide liquid-tight flexible conduit in wet locations. Provide separate ground conductor across flexible connections.
10. Arrange conduit to maintain headroom and present neat appearance.
11. Cut conduit square using saw or pipe cutter; deburr cut ends. For field cut threaded conduits, provide field applied anti-corrosion material to the threads in accordance with the manufacturer's instructions and per the NEC. Product shall be Thomas & Betts KOPR-Shield or approved equal.
12. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
13. Install no more than equivalent of three 90 degree bends between boxes.
14. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
15. Provide suitable fittings to accommodate expansion and deflection where conduit crosses expansion joints.
16. Use Suitable caps to protect installed conduit against entrance of dirt and moisture.
17. Ground and bond conduit under as per NEC 250.

3.02 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods specified in other sections.

- B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation. Coordinate installation with representative of roofing material manufacturer to maintain any roof warranty.

END OF SECTION

SECTION 26 05 35

OUTLET, JUNCTION AND PULL BOXES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Outlet, Junction and Pull Boxes, as shown on the Plans, as specified, and/or directed.
- B. Plans (drawings) are diagrammatic and show only approximate locations of equipment, fixtures, devices, etc. Plans may not show exact quantity and locations of Junction and Pull Boxes required for a complete installation. Exact locations and routing shall be determined in the field and shall suit the job conditions. Quantities and locations of Outlet, Junction, and Pull Boxes shall be provided to suit the installed arrangement and meet all NEC and local code requirements.

1.02 REFERENCES

- A. NEMA
- B. UL. (Specifically UL 514A)
- C. NFPA 70

1.03 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.
 - 1. For fire rated construction, prove that materials and installation methods proposed for use are in accordance with the listing requirements of the classified construction.
- B. Shop Drawings: Plans, elevations, sections, and details for all custom enclosures and cabinets

1.04 GENERAL REQUIREMENTS

- A. Section 26 05 01, "Electrical General Requirements", applies to this Section, with the additions and modifications specified herein.

PART 2 - PRODUCTS

2.01 GALVANIZED STEEL OUTLET BOXES

- A. Standard galvanized steel boxes and device covers by Appleton Electric Co., Cooper/Crouse-Hinds, Hubbell, or approved equal.

2.02 GALVANIZED STEEL JUNCTION AND PULL BOXES

- A. Code gage, galvanized steel screw cover boxes by Hoffman Enclosures Inc., Hubbell Wiegmann, or approved equal

2.03 THREADED TYPE BOXES

- A. Outlet Boxes: For Dry, Damp Locations: Zinc electroplate malleable iron or cast iron alloy boxes by Appleton Electric Co., Cooper/Crouse-Hinds Co., or approved equal with zinc electroplate steel covers to suit application. For classified spaces, provide outlet boxes rated for Class I, Div. 1, group D hazardous areas as manufactured by Crouse-Hinds, Appleton or approved equal.
- B. For Wet Locations: Malleable iron or cast iron alloy boxes with hot dipped galvanized or other specified corrosion resistant finish as produced by Cooper/Crouse-Hinds (hot dipped galvanized or Corro-free epoxy powder coat), or OZ/Gedney Co. (hot dipped galvanized), with stainless steel cover screws, and malleable iron covers gasketed to suit application.
- C. Junction and Pull Boxes:
 - 1. For Dry, Damp Locations: Zinc electroplate cast iron boxes by Appleton Electric Co., Cooper/Crouse-Hinds, or approved equal with zinc electroplate steel or cast iron cover.
 - 2. For Wet Locations: Cast iron boxes by Cooper/Crouse-Hinds' (hot dipped galvanized or Corro-free epoxy powder coat), or OZ/Gedney Co. (hot dipped galvanized), or approved equal, with stainless steel cover screws and cast iron cover gasketed to suit application.
 - 3. For classified spaces, provide junction and pull boxes rated for Class I, Div. 1, group D hazardous areas as manufactured by Crouse-Hinds, Appleton or approved equal.
- D. Conduit Bodies, Threaded (Provided with a Volume Marking):
 - 1. For Dry, Damp Location: Zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, or approved equal.
 - 2. For Wet Locations: Malleable iron or cast iron alloy bodies with hot dipped galvanized or other specified corrosion resistant finish; Cooper/Crouse-Hinds' Condulets (hot dipped galvanized or Corro-free epoxy power coat), or OZ/Gedney Co.'s Conduit Bodies (hot dipped galvanized) or approved equal, with stainless steel cover screws and malleable iron covers gasketed to suit application.

3. For classified spaces, provide outlet conduit bodies rated for Class I, Div. 1, group D hazardous areas as manufactured by Crouse-Hinds, Appleton, or approved equal.

2.04 SPECIFIC PURPOSE OUTLET BOXES

- A. As fabricated by manufacturers for mounting their equipment.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Before proceeding with the installation of junction and pull boxes, check the locations with the Director's Representative and have same approved.

3.02 INSTALLATION

- A. Mounting Position of Wall Outlets For Wiring Devices: Unless otherwise indicated, install boxes so that the long axis of each wiring device will be vertical.
- B. Height of Wall Outlets: Unless otherwise indicated, locate outlet boxes with their center lines at the following elevations above finished floor:

Switches	4'-0"
Single & Duplex Receptacles	1'-6"
Special Purpose Receptacles	4'-0"
Telephone/Data Outlets	1'-6"
Telephone Outlets (Wall Phones)	4'-0"
Above-Counter Devices	8" Above Counter
Fire Alarm Manual Station	4'-0"
Fire Alarm Notification Device	7'-0"

- C. Wall Outlet Location: Locations shown on drawings are approximate only. Locate wall outlet boxes as near to position indicated as possible, but so as to avoid conflicts with other trades (architectural, mechanical, plumbing, structural, etc.).
- D. Where devices of different mounting heights are shown on drawings at same location, align outlet boxes along a common vertical line.
- E. Outlet boxes in a common wall serving separate rooms shall not be installed back-to-back.
- F. Outlet boxes shall be sized to accommodate the device that is to be installed.
- G. Provide box extensions and/or trim rings as required to accommodate construction of wall/ceiling in which boxes are recessed.

- H. Supplementary Junction and Pull Boxes: In addition to junction and pull boxes indicated on the drawings and required by NFPA 70, provide supplementary junction and pull boxes as follows:
 - 1. When required to facilitate installation of wiring.
 - 2. At every third 90 degree turn in conjunction with raceway sizes over 1 inch.
 - 3. At intervals not exceeding 100 feet in conjunction with raceway sizes over 1 inch.
- I. All Junction and Pull Boxes shall have a screw-on cover plate. Cover plate shall match box material and construction.
- J. Junction and Pull Boxes shall be installed in locations that are readily accessible, and shall not be blocked by equipment, piping, ducts, structural supports, etc.

3.03 OUTLET, JUNCTION, AND PULL BOX SCHEDULE

- A. Boxes For Concealed Conduit System:
 - 1. Non-Fire Rated Construction:
 - a. Depth: To suit job conditions and comply with NFPA 70 Article 370.
 - b. For Lighting Fixtures: Use galvanized steel outlet boxes designed for the purpose.
 - 1) For Fixtures Weighing 50 lbs. or Less: Box marked "FOR FIXTURE SUPPORT".
 - 2) For Fixtures More Than 50 lbs: Box listed and marked with the weight of the fixture to be supported (or support fixture independent of the box).
 - c. For Ceiling Suspended Fans:
 - 1) For Fans Weighing 35 lbs or Less: Marked "Acceptable for Fan Support."
 - 2) For Fans Weighing More Than 35 lbs, up to 70 lbs: Marked "Acceptable for Fan Support up to 70 lbs (or support fan independent of the box)."
 - d. For Junction and Pull Boxes: Use galvanized steel boxes with flush covers.
 - e. For Switches, Receptacles, Etc:
 - 1) Plaster or Cast-In-Place Concrete Walls: Use 4 inch or 4-11/16 inch galvanized steel boxes with device covers.
 - 2) Walls Other Than Plaster or Cast-In-Place Concrete: Use type of galvanized steel box which will allow wall plate to cover the opening made for the installation of the box.
- B. Boxes For Exposed Conduit System:
 - 1. Dry and Damp Locations: Use zinc electroplate or hot dipped galvanized threaded type malleable iron or cast iron alloy outlet, junction, and pull boxes or conduit bodies provided with a volume marking in conjunction

with ferrous raceways unless otherwise specified or indicated on the drawings.

- a. Galvanized steel boxes may be used in conjunction with conduit sizes over 1 inch in non-hazardous dry and damp locations.
 - b. Galvanized steel boxes may be used in conjunction with electrical metallic tubing where it is allowed (specified) to be installed exposed as branch circuit conduits at elevations over 10'-0" above finished floor.
2. Wet Locations: Use threaded type malleable iron or cast iron alloy outlet junction, and pull boxes or conduit bodies (provided with a volume marking) with hot dipped galvanized or other specified corrosion resistant coating in conjunction with ferrous raceways unless otherwise specified or indicated on the drawings.
- a. Use corrosion resistant boxes in conjunction with plastic coated rigid ferrous metal conduit.
- C. Specific Purpose Outlet Boxes: Use to mount equipment when available and suitable for job conditions. Unless otherwise specified, use threaded type boxes with finish as specified for exposed conduit system, steel (painted) for surface metal raceway system and galvanized steel for recessed installations.

3.04 LABELING

- A. Identify junction and pull boxes for system served (i.e. power, lighting, fire alarm, telephone, data, public address, nurse call, etc.), using stencil lettering on box cover.
- B. Identify panelboard and circuit number of all conductors contained within junction and pull boxes, using stencil lettering on box cover.
- C. Identify junction and pull boxes for systems over 600V as follows: "DANGER HIGH VOLTAGE – KEEP OUT." Label shall be white stencil lettering, minimum 1" text height, on box cover.

END OF SECTION

SECTION 26 05 43

UNDERGROUND ELECTRICAL WORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Underground Electrical Work, as shown on the Plans, as specified, and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
1. Federal Specification (Fed. Spec.):
 - a. RR-F-621C - Frame, Covers, Gratings, Steps, Sump and Catch Basin, Manhole
 2. American Association of State Highway and Transportation Officials (AASHTO) Publications:
 - a. HB-12 - Highway Bridges, Including Interim Specifications
 - b. M 198 - Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
 3. American Concrete Institute (ACI) Publications:
 - a. 315 - Details and Detailing of Concrete Reinforcement
 - b. 318 - Building Code Requirements for Reinforced Concrete
 4. American National Standards Institute (ANSI) Publication:
 5. C2 - National Electrical Safety Code (NESC)
 6. American Society for Testing and Materials (ASTM) Publications:
 - a. B1 - Hard-Drawn Copper Wire
 - b. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
 - c. C32 - Sewer and Manhole Brick (Made from Clay or Shale)
 - d. C260 - Air-Entraining Admixtures for Concrete
 - e. C309 - Liquid Membrane-Forming Compounds for Curing Concrete
 - f. D698 - Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (2.49-kg) Rammer and 12-in. (305-mm) Drop
 - g. D1556 - Density of Soil in Place by the Sand-Cone Method
 - h. D1557 - Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop
 - i. D1682 - Breaking Load and Elongation of Textile Fabrics

7. Association of Edison Illuminating Companies (AEIC) Publications:
 - a. Impregnated-Paper-Insulated Lead Covered Cable, Solid Type (10th Edition)
8. National Electrical Manufacturer's Association (NEMA) Publications:
 - a. RN 1 - Polyvinyl-Chloride Externally Coated Galvanized Rigid Steel Conduit and Electrical Metallic Tubing
 - b. TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80)
 - c. TC 3 - PVC Fittings for Use With Rigid PVC Conduit and Tubing
 - d. TC 6 - PVC and ABS Plastic Utilities Duct for Underground Installation
 - e. TC 9 - Fittings for ABS and PVC Plastic Utilities Duct for Underground Installation
 - f. WC 7 - Cross-Linked-Thermosetting- Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (ICEA S-66-524)
 - g. WC 8 - Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy (ICEA S-68-516)
9. National Fire Protection Association (NFPA) Publication:
 - a. 70 - National Electrical Code (NEC)
10. U.S. Department of Agriculture, Rural Electrification Administration (REA) Bulletins:
 - a. 344-2 - List of Materials Acceptable for Use on Telephone Systems of REA Borrowers
 - b. 345-6 - Splicing Plastic-Insulated Cables (PC-2)
 - c. 345-14 - Direct Burial Telephone Cable (Air Core) (PE-23)
 - d. 345-26 - Buried Plant Housings (PE-35)
 - e. 345-67 - Filled Telephone Cables (PE-39)
11. Underwriters Laboratories Inc. (UL) Publications:
 - a. 6 - Rigid Metal Conduit
 - b. 467 - Grounding and Bonding Equipment
 - c. 510 - Insulating Tape
 - d. 514A - Metallic Outlet Boxes
 - e. 514B - Fittings for Conduit and Outlet Boxes
 - f. 854 - Service-Entrance Cables
 - g. 1242-83 - Intermediate Metal Conduit

1.03 GENERAL REQUIREMENTS

- A. The following Sections apply to this Section with additions and modifications specified herein:
 1. Section 26 05 01, "Electrical General Requirements"
 2. Section 26 05 19, "Wiring/Cable, 600Volts and Under".
 3. Section 26 05 26, "Grounding".
 4. Section 26 05 34, "Conduit".

- B. Laboratory Tests:
 - 1. Determine soil-density relationships for compaction of backfill material in accordance with ASTM D1557, Method D.

1.04 SUBMITTALS

- A. Shop Drawings including Manufacturer's Data:
 - 1. Conduit spacers for encased concrete duct bank buried detectable warning tape
 - 2. Bedding material
 - 3. Backfill material
 - 4. Concrete
 - 5. Rebar and reinforcing materials
 - 6. Splice box
 - 7. Insulating tape
 - 8. Manhole frame and cover handhole frame and cover
 - 9. Sealing material for precast manhole and handhole joints
 - 10. Telephone pedestals
 - 11. Precast manholes and handholes: Calculations and shop drawings for precast manholes and handholes shall bear the seal of a registered professional engineer.
 - a. Material description (i.e., f_c and f_y)
 - b. Manufacturer's printed assembly and installation instructions
 - c. Design calculations
 - d. Reinforcing shop drawings prepared in accordance with ACI 315
 - e. Plans and elevations showing opening and pulling-in iron locations and details
 - f. Pulling-in iron
- B. Manufacturer's Instructions:
 - 1. Manufacturer's directions for use of ground megger with proposed method indicated
 - 2. Terminator manufacturer's installation instructions
- C. Certificates of Compliance:
 - 1. Material and Equipment: Provide manufacturer's statement certifying that the product supplied meets or exceeds contract requirements.
 - a. Precast hand hole and accessories
 - b. Hand hole frame and cover

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Provide materials and equipment listed by UL or approved by Factory Mutual (FM) System when such equipment is listed or approved.

- B. Conduit: Shall be per Section 26 05 34 "Conduit".
- C. Plastic Insulating Tape: UL 510.
- D. Wire and Cable Shall be per Section 26 05 19 "Wiring/Cable, 600Volts and Under"
 - 1. Connectors and Terminals: Shall be designed and approved for use with the associated conductor material, and shall provide a uniform compression over the entire contact surface. Solderless terminal lugs shall be used on stranded conductors. For connecting aluminum to copper, connectors shall be the circumferentially compressed, metallurgically bonded type.
- E. Grounding and Bonding Equipment: Per Section 26 05 26 "Grounding".
- F. Materials for Manholes and Hand Holes: Referred to throughout this Section as "structures" or "underground structure".
 - 1. Brick shall be sewer and manhole brick conforming to ASTM C32, Grade MS.
 - 2. Metal Frames and Covers: Provide steel frames and covers conforming to Fed. Spec. RR-F-621 except where rolled steel floor plate is indicated.
 - 3. Fiberglass Hand Holes: Shall be matched die molded of dark green fiberglass. When buried, the unit shall be capable of supporting an ultimate downward load of 6500 pounds distributed over a 6-inch by 6-inch area imposed anywhere on the cover surface (H10 loading per AASHTO HB-12). Unit shall have precut 6-inch by 6-inch cable entrance at the center bottom of each side. A fiberglass weatherproof cover with nonskid surface shall be provided for each hand hole. Covers shall be capable of being locked into position.
 - 4. Polymer Concrete Hand Holes: Shall be matched die molded of dark green fiberglass. When buried, the unit shall be weight load rated as Tier T22: 22,000 pound design and 33,750 pound test (ANSI). Unit shall have precut 6-inch by 6-inch cable entrance at the center bottom of each side. A weatherproof cover with nonskid surface shall be provided for each hand hole. Covers shall be capable of being locked into position.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Underground installation shall conform to ANSI C2 and NFPA 70 except as otherwise specified or indicated.
- B. Contractor Damage: The Contractor shall promptly repair any indicated utility lines or systems damaged by Contractor operations. If the Contractor is advised in writing of the location of a non-indicated line or system, such notice shall

provide that portion of the line or system with "indicated" status in conformance with the Contract Documents. The Contractor shall immediately notify the Engineer of any such damage to any underground line that is indicated on Contract Drawings, indicated by supplemental information from the Engineer or not indicated.

- C. Direct Burial System: Bury cables directly in earth, except under railroad tracks, paved areas, and roadways; install cables in conduit encased in concrete. Slope ducts to allow drainage. Trenches in which the cables are placed shall be excavated by hand or with mechanical trenching equipment. Provide a minimum cable cover of 24 inches below finished grade for power conductors operated at less than 600 volts. Trenches shall be not less than 6 inches wide, and shall be in straight lines between cable markers. Bends in trenches shall have a radius of not less than 36 inches. Where two or more cables are laid parallel in the same trench, space cables laterally at least 3 inches apart. If rock is encountered, remove rock to a minimum depth of 3 inches below the cable and fill the space with sand or clean earth free from particles larger than 1/4 inch. Cables shall not be unreeled and pulled into the trench from one end. However, the cable may be unreeled on grade and lifted into position. Provide a plastic warning tape as specified herein.
1. Cables crossing other cables or metal piping shall be separated from the other cables or pipe by not less than 3 inches of well-tamped earth.
 2. Cables shall be in one piece without splices between connections except where the distance exceeds the lengths in which the cable is furnished.
 3. Bends in cables shall be not less than those specified in NFPA 70 for the type of cable specified.
 4. Horizontal slack of approximately 3 feet shall be left in the ground on each end of cable runs, on each side of connection boxes, and at all points where connections are brought above ground. Where cable is brought aboveground, leave additional slack to make necessary connections.
- Identification Slabs Markers: Provide a slab at each change of direction of the cable, over the ends of ducts or conduits which are installed under paved areas and roadways, and over each splice. Identification slabs shall be concrete, approximately 20 inches square by 6 inches thick, and shall be set flat in the ground so that the top surface projects not less than 3/4 inch, nor more than 1-1/4 inches aboveground. The concrete shall have a minimum compressive strength of 3000 psi and shall have a smooth, troweled finish on exposed surface. Inscribe an identifying legend such as "cable", "duct", "splice", or other applicable designation on the top surface of slab before the concrete hardens. Inscribe circuit identification symbols on slabs as directed. The letters or figures shall be approximately 2 inches high, and the grooves shall be approximately 1/4 inch in width and depth. Install the slabs so that the side nearest the inscription on the top shall include an arrow indicating the side nearest the cable.
- D. Underground Duct Without Concrete Encasement: Direct buried ductbank systems. Shall be as shown on the Contract Documents.

1. The top of the conduit shall be not less than 24 inches below grade, shall have a minimum slope of 3 inches in each 100 feet away from buildings and toward manholes and other necessary drainage points, and shall run in straight lines except where a change of direction is necessary. As each conduit run is completed, a testing mandrel not less than 12 inches long with a diameter 1/4 inch less than the inside diameter of the conduit shall be drawn through each conduit, after which a stiff-bristled brush shall be drawn through until the conduit is clear of earth, sand, or gravel particles. Conduit plugs shall then immediately be installed. Ensure a minimum 3-inch clearance from the conduit to each side of the trench. Grade the bottom of the trenches smooth; where rock, soft spots, or sharp-edged materials are encountered, excavate the bottom for an additional 3 inches; fill with sand or earth, free from particles that would be retained on a 1/4-inch sieve; and tamp level with the original bottom.
2. Under roads, paved areas, and railroad tracks, install conduits in concrete encasement of rectangular cross-section providing a minimum of 3-inch concrete cover around ducts. The concrete encasement shall extend at least 8 feet beyond the edges of paved areas and roads, and 12 feet beyond the rails on each side of railroad tracks. Conduits to be installed under existing paved areas which are not to be disturbed, and under roads and railroad tracks, shall be zinc-coated, rigid steel, jacked into place.
3. Separate multiple conduits with a minimum concrete thickness of 2 inches, except that light and power conduits shall be separated from control, signal, and telephone conduits by a minimum distance of 12 inches. Stagger the joints of the conduits by rows and layers to strengthen the conduit assembly. Provide plastic duct spacers that interlock vertically and horizontally. Spacer assembly shall consist of base spacers, intermediate spacers, and top spacers to provide a completely enclosed and locked-in conduit assembly. Install spacers per manufacturer's instructions, but provide a minimum of two spacer assemblies per 10 feet of conduit assembly.

E. Underground Duct With Concrete Encasement: Encased only and reinforced concrete duct banks. Shall be constructed of individual conduits encased in concrete. Except where rigid galvanized steel conduit is indicated or specified, the conduit shall conform to NEMA TC 6, Type EB. The type of conduit used shall not be mixed in any one duct bank. Ducts shall be a minimum of 4 inches in diameter unless otherwise indicated. The concrete encasement surrounding the bank shall be rectangular in cross-section and shall provide at least 3 inches of concrete cover around ducts. Separate conduit by a minimum concrete thickness of 2 inches, except separate light and power conduits from control, signal, and telephone conduits by a minimum concrete thickness of 12 inches.

1. The top of the concrete envelope shall be a minimum of 18 inches below grade, except under roads and pavement, concrete envelope shall be a minimum of 24 inches below grade.
2. Duct banks shall have a continuous slope downward toward underground structures and away from buildings with a minimum pitch of 3 inches in

100 feet. Except at conduit risers, changes in direction of runs exceeding a total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet; sweep bends may be composed of one or more curved or straight sections or combinations thereof. Manufactured bends shall have a minimum radius of 18 inches for use with conduits of less than 3 inches in diameter and a minimum radius of 36 inches for ducts of 3 inches in diameter and larger. Excavate trenches along straight lines from structure to structure before ducts are laid or structure constructed so the elevation can be adjusted, if necessary, to avoid unseen obstruction.

3. Terminate conduits in end-bells where ducts enter underground structures. Stagger the joints of the conduits by rows and layers to strengthen the duct bank. Provide plastic duct spacers that interlock vertically and horizontally. Spacer assembly shall consist of base spacers, intermediate spacers, and top spacers to provide a completely enclosed and locked-in duct bank. Install spacers per manufacturer's instructions, but provide a minimum of two spacer assemblies per 10 feet of duct bank. Before pouring concrete, anchor duct bank assemblies to prevent the assemblies from floating during concrete pouring. Anchoring shall be done by driving reinforcing rods adjacent to every other duct spacer assembly and attaching the rod to the spacer assembly.
4. As each section of a duct bank is completed from structure to structure, a testing mandrel not less than 12 inches long with a diameter 1/4 inch less than the inside diameter of the conduit shall be drawn through each conduit, after which a stiff-bristled brush, having the diameter of the conduit shall be drawn through until the conduit is clear of earth, sand, and gravel particles. Conduit plugs shall then be immediately installed.
5. New conduit indicated as being unused or empty shall be provided with plugs on each end. Plugs shall contain a weep hole or screen to allow water drainage. Provide a plastic pull rope (minimum 200# rating) having 3 feet of slack at each end of unused or empty conduits.
6. Connections to Manholes/Handholes: Duct bank envelopes connecting to underground structures shall be flared to have an enlarged cross-section at the manhole entrance to provide additional shear strength. The dimensions of the flared cross-section shall be larger than the corresponding manhole opening dimensions by no less than 12 inches in each direction. The perimeter of the duct bank opening in the underground structure shall be flared toward the inside or keyed to provide for a positive interlock between the duct bank and the wall of the structure. Vibrators shall be used when this portion of the envelope is poured to assure a seal between the envelope and the wall of the structure.
 - a. For connection to precast concrete and cast-in-place concrete handholes/manholes: Provide concrete encasement for all conduit ductbank systems (direct buried conduit ductbank, concrete encased conduit ductbank, reinforced concrete encased ductbank) connections at handholes a minimum of 48" from

manhole/handhole. Concrete shall be keyed into manhole/handhole.

7. Connections to Existing Hand Holes: For duct bank connections to existing structures, break the structure wall out to the dimensions required and preserve the steel in the structure wall. Cut the steel and extend it into the duct bank envelope. Chip the perimeter surface of the duct bank opening to form a key or flared surface, providing a positive connection with the duct bank envelope.
 8. Connections to Concrete Pads: For duct bank connections to concrete pads, break an opening in the pad out to the dimensions required and preserve the steel in the pad. Cut the steel and extend it into the duct bank envelope. Chip out the opening in the pad to form a key for the duct bank envelope.
 9. Connections to Existing Ducts: Where connections to existing duct banks are indicated, excavate the banks to the maximum depth necessary. The banks shall be cut off and loose concrete removed from the conduits before new concrete-encased ducts are installed. A reinforced concrete collar, poured monolithically with the new duct bank, shall be provided to take the shear at the joint of the duct banks. Remove existing cables which constitute interference with the work. Abandon in place the unused ducts and cables which do not interfere with the work.
 10. Partially Completed Duct Banks: During construction wherever a construction joint is necessary in a duct bank, prevent debris such as mud, sand, and dirt from entering ducts by providing suitable conduit plugs. Fit concrete envelope of a partially completed duct bank with reinforcing steel extending a minimum of 2 feet back into the envelope and a minimum of 2 feet beyond the end of the envelope. Provide one No. 4 bar in each corner, 3 inches from the edge of the envelope. Secure corner bars with two No. 3 ties, spaced approximately 1 foot apart. Restrain reinforcing assembly from moving during concrete pouring.
- F. Concrete for Electrical Requirements: Concrete shall be 4,000 psi minimum ultimate 28-day compressive strength with 1-inch maximum aggregate conforming to the requirements of Section 03 30 00, "Cast-in-Place Concrete".
- G. Buried Utility Warning and Identification Tape: Provide detectable aluminum foil plastic-backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried cable and conduit. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 2 inches minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED ELECTRIC CABLE BELOW or similar. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material. Bury tape with the printed side up at a depth of 12 inches below the top surface of earth or the top surface of the subgrade under pavements.

H. Reconditioning of Surfaces:

1. Unpaved surfaces disturbed during the installation of duct or direct burial cable shall be restored to the original elevation and condition. Sod or topsoil shall be preserved carefully and replaced after the backfilling is completed. Replace damaged sod with sod of equal quality. Where the surface is disturbed in a newly seeded area, the disturbed surface shall be reseeded with the same quantity and formula of seed as that used in the original seeding.
2. Paving Repairs: Where trenches, pits, or other excavations are made in existing roadways and other areas of pavement where surface treatment of any kind exists, such surface treatment or pavement shall be restored to the same thickness and in the same kind as previously existed, except as otherwise specified, and to match and tie into the adjacent and surrounding existing surfaces in a neat and acceptable manner.

I. Cable Pulling: Test existing ducts with a mandrel and thoroughly swab out to remove foreign material before the pulling of cables. Cables shall be pulled down grade with the feed-in point at the manhole or buildings of the highest elevation. Flexible cable feeds shall be used to convey cables through the manhole opening and into the ducts. Cable lubricants shall be lubricants specifically recommended by the cable manufacturer. Cable-pulling tensions shall not exceed the maximum pulling tension recommended by the cable manufacturer. Do not exceed the specified cable bending radii when installing cable under any conditions, including turnups into switches, transformers, switchgear, switchboards, and other enclosures. Cable with tape shield shall have a bending radius not less than 12 times the overall diameter of the completed cable. Cable with wire shield shall have a bending radius not less than eight times the overall diameter of the completed cable. If basket-grip type cable-pulling devices are used to pull cable in place, cut off the section of cable under the grip before splicing and terminating.

1. Installation of Cables in Manholes, Hand Holes, and Vaults: Route cables along walls providing the longest route and the maximum spare cable lengths. Form cables to closely parallel walls without interference to duct entrances. Support cables on brackets and cable insulators at a maximum of 4 feet. In existing manholes, hand holes, and vaults where new ducts are to be terminated, or where new cables are to be installed, the existing installation of cables, cable supports, and grounding shall be modified as required with cables arranged and supported as specified for new cables. Identify each cable by corrosion-resistant embossed metal tags attached in each underground structure in accordance with the cable schedule and as approved by the Engineer. Example: 600V cable, Circuit 4-Sub. NB - to SP. Identify each phase of the 600V cable.

J. Hand Holes:

1. Workmanship: Underground structures shall be precast construction as specified herein. Horizontal concrete surfaces of floors shall have a smooth trowel finish. Locate duct entrances and windows in the center

of end walls (shorter) and near the corners of sidewalls (longer) to facilitate cable racking and splicing. Covers for underground structures shall fit the frames without undue play. Steel and iron shall be formed to shape and size with sharp lines and angles. Castings shall be free from warp and blowholes that may impair strength or appearance. Exposed metal shall have a smooth finish and sharp lines and arises. Provide necessary lugs, rabbets, and brackets. Set pulling-in irons and other built-in items in place before depositing concrete. The words "electric" and "telephone" shall be cast in the top face of power and telephone manhole covers, respectively.

2. Precast Concrete Construction: Precast units shall be the product of a manufacturer regularly engaged in the manufacture of precast concrete products, including precast manholes and hand holes.

- a. General: Precast concrete structures shall have the same accessories and facilities as required for poured-in-place structures. Likewise, precast structures shall have plan area and clear heights not less than those of poured-in-place structures. Concrete materials and methods of construction shall be the same as for poured-in-place concrete construction, as modified herein. Slope in floor may be omitted provided precast sections are poured in reinforced steel forms. Concrete for precast work shall have an ultimate 28-day compressive strength of not less than 4000 psi. Structures may be precast to the design and details indicated for poured-in-place construction, precast monolithically and placed as a unit, or structures may be assembled sections, designed and produced by the manufacturer in accordance with the requirements specified. Structures shall be identified with the manufacturer's name embedded in, or otherwise permanently attached to, an interior wall face.

- b. Design for Precast Structures: ACI 318. In the absence of detailed on-site soil information, design for the following soil parameters/site conditions:

Angle of Internal Friction (ϕ) = 30 degrees

Unit Weight of Soil (γ) = 110 pcf

Coefficient of Lateral Earth Pressure (K_o) = 0.50

Ground Water Level = 3 feet below ground elevation

Vertical design loads shall include full dead, superimposed dead, and live loads including a 30 percent magnification factor for impact. Live loads shall consider all types and magnitudes of vehicular (automotive, industrial, or aircraft) traffic to be

encountered. The minimum design vertical load shall be for H20 highway loading per AASHTO HB-12.

Horizontal design loads shall include full geostatic and hydrostatic pressures for the soil parameters, water table, and depth of installation to be encountered. Also, horizontal loads imposed by adjacent structure foundations, and horizontal load components of vertical design loads, including impact, shall be considered, along with a pulling-in iron design load of 6000 pounds.

Each structural component shall be designed for the load combination and positioning resulting in the maximum shear and moment for that particular component.

Design shall also consider the live loads induced in the handling, installation, and backfilling of the manholes. Provide lifting devices to ensure structural integrity during handling and installation.

- c. Construction: Structure top, bottom, and walls shall be of a uniform thickness of not less than 6 inches. Thin-walled knock-out panels for designed or future duct bank entrances shall not be permitted. Quantity, size, and location of duct bank entrance windows shall be as directed, and cast completely open by the precaster. The size of the windows shall exceed the nominal duct bank envelope dimensions by at least 12 inches in each direction to preclude in-field window modifications made necessary by duct bank misalignment. However, the sides of precast windows shall be a minimum of 6 inches from the inside surface of adjacent walls, floors, or ceilings. Form the perimeter of precast window openings to have a keyed or inward flared surface to provide a positive interlock with the mating duct bank envelope. Provide welded wire fabric reinforcing through window openings for in-field cutting and flaring into duct bank envelopes. Provide additional reinforcing steel comprised of at least two No. 4 bars around window openings. The minimum concrete cover for reinforcing steel shall be 2 inches. Provide drain sumps for precast structures a minimum of 12 inches in diameter and 4 inches deep.
- d. Joints: Provide tongue-and-groove joints on mating edges of precast components. Shiplap joints shall not be allowed. Design joints to firmly interlock adjoining components and to provide waterproof junctions and adequate shear transfer. Seal joints watertight using preformed plastic strip conforming to AASHTO M 198, Type B. Install sealing material in strict accordance with the sealant manufacturer's printed instructions. Provide waterproofing at conduit/duct entrances into structures and, where access frame meets the top slab, provide continuous grout seal.

3. Metal Frames and Covers: Frames and covers of steel shall be welded by qualified welders in accordance with standard commercial practice. Steel covers shall be rolled-steel floor plate having an approved anti-slip surface. Hinges shall be of galvanized steel with bronze hinge pin, 5 by 5 inches by approximately 3/16 inch thick, without screw holes, and shall be for full surface application by fillet welding. Hinges shall have non-removable pins and five knuckles. The surfaces of plates under hinges shall be true after the removal, by grinding or other approved method, of raised lugs.
 4. Precast Hand Holes Installation: Installation shall conform to the manufacturer's instructions.
 5. Field Painting: Cast-iron frames, covers, and gratings not buried in masonry shall be cleaned of mortar, rust, grease, dirt, and other deleterious materials, and coated with bituminous paint. Steel frames not buried in masonry and steel covers shall be cleaned of mortar, dirt, and grease by an approved blasting process. Surfaces that cannot be cleaned satisfactorily by blasting shall be cleaned to bare metal by wire brushing or other mechanical means. Surfaces contaminated with rust, dirt, oil, grease, or other contaminants shall be washed with solvents until thoroughly cleaned. Immediately after cleaning, surfaces shall be coated with a pretreatment coating or a crystalline phosphate coating. As soon as practicable after the pretreatment coating has dried, treated surfaces shall be coated with zinc chromate primer and synthetic exterior gloss enamel. Pretreatment primer and paint shall be as specified for shop painting in Section 26 05 01, "Electrical General Requirements".
 6. Removal of Ducts: Where duct banks are removed from existing underground structures, close the openings to waterproof the structure. Chip out the wall opening to provide a key for the new section of wall.
- K. Excavating, Backfilling, and Compacting: Excavate underground structures to depths indicated. If hard material is encountered, the provisions of the Contract respecting an adjustment for changed conditions shall apply, subject to the requirements of notification thereunder being given. Hard material shall be defined as solid rock; firmly cemented unstratified masses; conglomerate deposits possessing the characteristics of solid rock not ordinarily removed without systematic drilling and blasting; or any boulder, masonry, or concrete (except pavement) exceeding 1/2 cubic yard in volume.
1. Excavated materials not required or suitable for backfill shall be removed from the project site. Provide sheeting and shoring as necessary for protection of work and safety of personnel. Remove water from excavation by pumping or other approved method.
 2. Backfilling around structures shall consist of earth, loam, sand-clay, or sand and gravel, free from large clods of earth or stones over 1 inch in size. Backfill materials shall be placed symmetrically on all sides in loose layers not more than 9 inches deep. Each layer shall be moistened, if necessary, and compacted with mechanical or hand tampers to 90 percent compaction.

3. Backfilling Trenches: Place backfill in layers not more than 6 inches thick, and compact each layer. Backfilling shall progress as rapidly as the construction, testing, and acceptance of the work permits. Backfill shall be free from roots, wood scrap material, and other vegetable matter and refuse. Compaction of backfill shall be to 90 percent of ASTM D698 density. The first layer shall be earth or sand, free from particles that would be retained on a 1/4-inch sieve and extending not less than 3 inches above the top of the conduit or cables. The succeeding layers shall be excavated material having stones no larger than would pass through a 4-inch ring. The backfill may be moistened. The backfill shall be level with the adjacent surface, except that in sodded areas, leave a space equal to the thickness of the sod.
- L. Cable Terminating: Protect terminations of insulated power and lighting cables from accidental contact, deterioration of coverings, and moisture by the use of terminating devices and materials. Make terminations by using materials and methods indicated or specified herein or as designated by the written instruction of the cable manufacturer and termination kit manufacturer. Adequately support cables and cable terminations to avoid any excessive strain on the termination and the conductor connection.
- M. Splices for 600-Volt Class Cables: Splices in underground conduit systems shall be made only in accessible locations such as manholes and hand holes, using a compression connector on the conductor and by insulating and waterproofing by one of the following methods suitable for continuous submersion in water.
 1. Cast-type splice insulation shall be provided by means of a molded casting process employing a thermosetting epoxy resin insulating material which shall be applied by a gravity-poured method or by a pressure-injected method. The component materials of the resin insulation shall be in a packaged form ready for convenient mixing without removing from the package. Do not allow the cables to be moved until after the splicing material has completely set.
 2. Gravity-poured method shall employ materials and equipment contained in an approved commercial splicing kit which includes a mold suitable for the cables to be spliced. When the mold is in place around the joined conductors, prepare and pour the resin mix into the mold. Do not allow cables to be moved until after the splicing materials have completely set.
- N. Grounding: Shall be per Section 26 05 26, "Grounding".
- O. Special Conditions: During the construction of duct banks and underground structures located in access roads, streets and similar traffic areas, these area shall remain open to traffic. Plan and execute the work to meet this condition. At locations where duct banks cross railroad tracks and the work requires closing of the tracks, secure permission from the Engineer and Railroad Owner for each track closure.

3.02 FIELD TESTS

- A. As an exception to requirements that may be stated elsewhere in the Contract, notify the Engineer in writing at least 5 working days prior to each tests. Furnish labor, equipment, and incidentals required for testing, except that the Owner will provide electric power required for the tests. Correct defects in the work provided by the Contractor and repeat tests until the work is in compliance with contract requirements. Show by demonstration in service that circuits and devices are in good operating condition. Tests shall be such that each item of control equipment will function not less than five times.
- B. Compaction: Backfill shall be tested in accordance with ASTM D1556, one test per lift per 2000 square feet.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials, equipment and accessories for Panelboards, as shown on the Plans, as specified and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only and shall be the most current version.
 - 1. National Electrical Contractors Association (NECA) Publication:
 - 2. Standard of Installation
 - 3. National Electrical Manufacturers Association (NEMA) Publications:
 - a. AB1 - Molded Case Circuit Breakers
 - b. PB 1 - Panelboards
 - c. PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less
 - 4. National Fire Protection Association (NFPA) Publication:
 - a. 70 - National Electrical Code

1.03 SUBMITTALS

- A. Submittal Packages: Submit the shop drawings, product data, and the quality control submittals specified below at the same time as a package.
- B. Shop Drawings: Include the following for each panelboard.
 - 1. Cabinet and gutter size.
 - 2. Voltage and current rating.
 - 3. Panelboard short circuit rating. Indicate if rating is Fully Rated Equipment Rating, or where acceptable, UL listed Integrated Equipment Short Circuit Rating.
 - 4. Circuit Breaker Enumeration (Frame, Poles, KAIC.): Indicate if circuit breakers are suitable for the panelboards' Fully Rated Equipment Rating, or where acceptable, are series connected devices that have been test verified and listed with UL (include documentation proving the compatibility of the proposed circuit breaker combinations). Circuit breakers do not have to be listed as series connected devices when all of the circuit breaker interrupting ratings are equal to, or greater than, the short circuit rating of the panelboard.

- 5. Accessories.
- C. Product Data:
 - 1. Catalog sheets, specifications and installation instructions.
 - 2. Bill of materials.
- D. Maintenance Data: Include spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.
- E. Contract Closeout Submittals:
 - 1. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to Owner.

PART 2 - PRODUCTS

2.01 PANELBOARDS

- A. As produced by Cutler-Hammer/Eaton Corp, General Electric Co., , or Square D Co., having:
 - 1. Flush or surface type cabinets as indicated on the Contract Drawings.
 - 2. Increased gutter space for gutter taps, sub-feed wiring, through-feed wiring, oversize lugs.
 - 3. UL label "SUITABLE FOR USE AS SERVICE EQUIPMENT" where used as service equipment.
 - a. Where indicated, equip panelboards used as service equipment with secondary surge arresters; GE's Tranquell Series, Joslyn's Mfr. Co.'s Surge Tec Series, Intermatic Incorp.'s AG2401 or AG6503, Square D Co.'s SDSA 1175 or SDSA 3650, to suit system primary (transformer size, available current) and secondary characteristics.
 - 4. Door and one piece trim. Door fastened to trim with butt or piano hinges. Trim fastened to cabinet with devices having provision for trim adjustment. Provide door-in-door trim.
 - 5. Door lock. 2 keys with each lock. All locks shall be keyed alike.
 - 6. Solid copper bus bars. Ampere rating of bus bars not less than frame size of main circuit breaker.
 - 7. Full capacity copper isolated neutral bus in panelboards where neutrals are required and the panel is not utilized as service equipment.
 - 8. Copper equipment grounding bus in panelboards where equipment grounding conductors are required.
 - 9. Sections designated "space" or "provision for future breaker" equipped to accept future circuit breakers.
 - 10. Lock on devices for exit light, fire alarm, stair well circuits or as indicated on Contract Drawings.

11. Provisions for padlocking circuit breaker handle in OFF position where indicated.
12. Blank circuit directories in plastic pockets.
13. Short circuit rating not less than indicated on panelboard schedule. Furnish panelboards having Fully Rated Equipment Rating (the short circuit rating of the panelboard is equal to the lowest interrupting rating of any device installed in the panelboard).
14. Molded Case Circuit Breakers.
 - a. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles. Do not use tandem circuit breakers. Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. The fault interrupter shall detect and trip on current imbalance of 6 milliamperes or greater per requirements of UL 943 for Class A GFCI devices.
 - b. Components: See panelboard schedule for specific components required for each circuit breaker. In addition to the specific components, equip each circuit breaker with additional components as required to achieve a coordinated selective scheme between the main circuit breaker and the branch/feeder circuit breakers when indicated on the panelboard schedule that a coordinated selective scheme is required.
 - c. Single pole 15 amp and 20 amp circuit breakers marked SWD where used as switches.
 - d. Single pole and two pole 15, 20, and 30 amp circuit breakers rated for high intensity discharge lighting loads when applicable.
15. Size of circuit breakers and rating of main lugs shall be as indicated on Contract Drawings.
16. Enclosure: NEMA rating as shown on Contract Documents.

2.02 NAMEPLATES

- A. General: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
 1. Phenolic: Two color laminated engravers stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
 2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.
 3. Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.
 4. Provide the following information on the panelboard door:
 - a. Panel designation
 - b. "Fed from". Descriptive location and/or main feeder connection indication.
 - c. Volts
 - d. 1 or 3 Phase indication and wire indication

- e. Bus Amperage
- f. Feeder phase/wire color designations.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install panelboards in accordance with NEMA Publication No. PB1.1 "General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less".
- B. Flush Cabinets: Set flush cabinets so that edges will be flush with the finished wall line. Where space will not permit flush type cabinets to be set entirely in the wall, set cabinet as nearly flush as possible, and cover the protruding sides with the trim extending over the exposed sides of the cabinet and back to the finished wall line.
- C. Directory: Indicate on typewritten directory the equipment controlled by each circuit breaker, and size of feeder servicing panelboard. For power panelboards also include ATE rating and feeder size for each breaker.
- D. Identification:
 - 1. Install nameplates on front of each panelboard.
 - a. Identification of 120/208 Volt Circuit Conductors:
 - 1) 2 wire circuit - white*, black.
 - 2) 3 wire circuit - white*, black, red.
 - 3) 4 wire circuit - white*, black, red, blue.*White is used only as neutral. Where neutral is not required, black, red, or black, red, blue is used for phase to phase circuits.
 - b. Identification of 277/480 Volt Circuit Conductors:
 - 1) 2 wire circuit - natural gray**, brown.
 - 2) 3 wire circuit - natural gray**, brown, yellow.
 - 3) 4 wire circuit - natural gray**, brown, yellow, orange.**Natural gray is used only as neutral. Where neutral is not required, brown, yellow, or brown, yellow, orange is used for phase to phase circuits.
- E. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.
- F. Provide filler plates for unused spaces in panelboards.
- G. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

3.02 FIELD QUALITY CONTROL

A. System Acceptance Test:

1. Preparation: Notify Owner/Engineer at least 3 working days prior to the test so arrangements can be made prior to the test to have a Facility Representative witness the test.
2. Make the following tests:
 - a. Test circuit breakers that have ground fault protection.
 - b. Test programmable solid state trip devices in accordance with the manufacturer's recommendations.
 - c. Supply all equipment necessary for system adjustment and testing.
 - d. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Wiring Devices as shown on the Plans, as specified, and/or directed.

1.02 REFERENCES

- A. NEMA
- B. UL
- C. NFPA 70

1.03 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

1.04 RELATED SECTIONS

- A. Section 26 05 01, "Electrical General Requirements", applies to this Section, with the additions and modifications specified herein.

PART 2 - PRODUCTS

2.01 SWITCHES

- A. Local Switches, Single Pole: 20A, 120/277 V ac; Bryant's 4901, Crouse-Hinds/AH's 1991, Hubbell's 1121/1221, Leviton's 1121/1221, Pass & Seymour's 20AC1.
- B. Local Switches, Double Pole: 20A, 120/277 V ac; Bryant's 4902, Crouse-Hinds/AH's 1992, Hubbell's 1222/1122, Leviton's 1222/1122, Pass & Seymour's 20AC2.
- C. Local Switches, Three-Way: 20A, 120/277 V ac; Bryant's 4903, Crouse-Hinds/AH's 1993, Hubbell's 1223/1123, Leviton's 1223-2/1123-2, Pass & Seymour's 20AC3.
- D. Local Switches, Four-Way: 20A, 120/277 V ac; Bryant's 4904, Crouse-Hinds/AH's 1994, Hubbell's 1224/1124, Leviton's 1224-2/1124-2, Pass & Seymour's 20AC4.

- E. Local Switches, Dimming: 20A, 120/277 V ac; Eaton's WBSD-010SLD, Leviton's 66EV-10W, Pass & Seymour's WS4FBL3PW.

2.02 RECEPTACLES

- A. Federal Spec./NEMA Grade Receptacles:
 - 1. Single receptacle, NEMA 5-20R (20A, 125 V, 2P, 3W); Bryant's 5361, Crouse-Hinds/AH's 5361, Hubbell's 5361, Leviton's 5361, or Pass & Seymour's 5361.
 - 2. Duplex receptacle, NEMA 5-20R (20A, 125 V, 2P, 3W); Bryant's 5362, Crouse-Hinds/AH's 5739-S, Hubbell's 5362, Leviton's 5362, Pass & Seymour's 5362, or Daniel Woodhead's 5362 DW.
- B. Ground Fault Interrupter Receptacles: Duplex receptacle rated 20A (NEMA 5-20R), circuit ampacity 20A; Bryant's GFR53FT, Crouse-Hind/AH's GF5342, Hubbell's GF 5352, Leviton's 6899, Pass & Seymour's 2091S,

2.03 WALL PLATES

- A. Stainless Steel Wall Plates: Type 302 stainless steel with satin finish. All areas except finished spaces or wet locations.
- B. Weatherproof/Wet Location Covers: UL 514D type "extra duty". Thomas & Betts Red Dot Code Keeper type 2CKU or equal.
- C. Finished areas: Polycarbonate. Color to match device color.

2.04 NAMEPLATES

- A. Phenolic Type: Standard phenolic nameplates with 3/16 inch minimum size lettering engraved thereon.
- B. Embossed Aluminum: Standard stamped or embossed aluminum tags, 3/16 inch minimum size lettering, as produced by Seton Name Plate Corp. or Tech Products Inc.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install wiring devices in outlet boxes.
- B. Local Switches:
 - 1. Install local switches rated 20A, 120/277 V ac for switches unless otherwise shown on the drawings or specified.
 - 2. Where more than one switch occurs at same location in a 120 volt system, arrange switches in gangs and cover with one face plate.

3. Install single and double pole switches so that switch handle is up when switch is in the “On” position.
- C. Receptacles:
1. Install Specification Grade receptacles, NEMA 5-20R, 20A, 125 V, 2P, 3W, for duplex receptacles and single receptacles unless otherwise shown on the drawings or specified.
 2. Install receptacles with ground pole in the down position.
- D. Wall Plates:
1. Install wall plates on all wiring devices in dry locations, with finish to match hardware in each area.
- E. Weatherproof In-use Covers: Install weatherproof covers on wiring devices in damp and wet locations.
- F. Nameplates: Provide phenolic or embossed aluminum nameplate for each special purpose receptacle indicating phase, ampere and voltage rating of the circuit. Attach nameplate with rivets or tamperproof fasteners to wall plate or to wall above receptacle. Wall plates may be engraved with required data in lieu of separate nameplates.
- G. Labels: Provide electronically-generated, self-sticking label at each wiring device. Label shall indicate panel designation and circuit number associated with respective device. Label shall be attached to outside of wall plate.
- H. Where Contract Drawings call out a classified area all equipment/devices and wiring methods to be suitable for this area per NEC. Refer to Contract Drawings for classified area locations.

END OF SECTION

SECTION 26 28 14

CIRCUIT BREAKERS FOR EXISTING PANELBOARDS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Circuit Breakers For Existing Panelboards, as shown on the Plans, as specified and/or directed.

1.02 SUBMITTALS

- A. Not Required.

PART 2 - PRODUCTS

2.01 CIRCUIT BREAKERS

- A. Similar to existing circuit breakers.
- B. Compatible with existing panelboard.
- C. Number of poles and ampere trip rating as indicated on Contract Drawings.
- D. Complete with accessories required for installation.
- E. All heating and air conditioning circuit breakers shall be "HACR" rated.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install new circuit breakers in existing panelboards where indicated.
- B. Add new circuits equally across phases to prevent overloading any phase in the panelboard. After new and existing circuits are energized, take current reading on panelboard feeder during a heavy usage time period. If phases are substantially unbalanced, rearrange both new and existing circuits in panelboard to equally distribute load between all phases, and provide new typewritten directory indicating equipment controlled by each circuit breaker.

END OF SECTION

SECTION 26 28 16

SAFETY SWITCHES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Safety Switches as shown on the Plans, as specified, and/or directed.

1.02 SUBMITTALS

- A. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 - PRODUCTS

2.01 SAFETY SWITCHES (SINGLE THROW)

- A. NEMA KS1, switches serving as motor-disconnect means shall be horsepower rated. Provide heavy-duty type switches where indicated, where switches are rated higher than 240 volts, and for double-throw switches.
- B. Fused Switches: Provide fused switch as required or indicated. Fused switches shall utilize Class R fuse holders and fuses unless otherwise indicated.
- C. Enclosure: Enclosure shall be NEMA rated for installation environment.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install switches so that the maximum height above the floor to the center of the operating handle does not exceed 6'-6".
- B. Identify each safety switch, indicating purpose or load served:
 - 1. NEMA 1 Enclosures: Rivet or bolt nameplate to the cover.
 - 2. NEMA 12 Enclosures: Rivet or bolt and gasket nameplate to the cover.
 - 3. NEMA 3R, 4, 4X Enclosures: Attach nameplate to the cover using adhesive specifically designed for the purpose, or mount nameplate on wall or other conspicuous location adjacent to switch. Do not penetrate enclosure with fasteners.

END OF SECTION

SECTION 26 56 00

SITE LIGHTING

PART 1 - GENERAL

1.01 SCOPE

- A. The work under this section Site Lighting includes exterior luminaires and accessories, poles, and foundations.

1.02 RELATED WORK

- A. Applicable provisions of Division 26 govern work under this Section.

1.03 REFERENCE STANDARDS

- A. International Building Code IBC 1807.3 Embedded Posts and Poles
- B. RoHS – Restriction of Hazardous Substances. Council of the European Union (EC) Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- C. LM-79-08 (or latest) – IES Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products.
- D. LM-80-08 (or latest) – IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- E. TM-21-11 (or latest) – IES Technical Memorandum on Projecting Long Term Lumen Maintenance of LED Light Sources.
- F. NEMA SSL 1-2010 (or latest) – Electronic Drivers for LED Devices, Arrays, or Systems.

1.04 DEFINITIONS

- A. Driver: The power supply used to power LED luminaires, modules, or arrays.
- B. L70, L₇₀, or L₇₀%; The reported life of an LED component or system to reach 70% lumen maintenance, or 70% of the LEDs original light output. This test is being developed by the IES and is currently described by TM-21-11.
- C. LEDs: Broadly defined as complete luminaire with light emitting diode (LED) packages, modules, light bars or arrays, complete with driver.
- D. LED luminaire failure: Negligible light output from more than 10 percent of the LEDs constitutes luminaire failure.

1.05 SUBMITTALS

- A. Shop Drawings: Indicate dimensions and components for each luminaire, pole and base.
- B. Product Data:
 - 1. For each luminaire type, submit luminaire information including catalog cuts with highlighted catalog numbers, and required accessories:
 - a. Luminaire:
 - 1) Manufacturer and catalog number,
 - 2) Type (identification) as indicated on the plans and schedule,
 - 3) Delivered lumens,
 - 4) Input watts,
 - 5) Efficacy,
 - 6) Color rendering index,
 - 7) Performance data, and
 - 8) Effective Projected Area (EPA).
 - b. Driver:
 - 1) Manufacturer and catalog number,
 - 2) Type (Non-Dimming, Step-dimming, Continuous dimming, etc.),
 - 3) Power Factor, Crest Factor, THD, etc.
 - c. Pole (if applicable):
 - 1) Diameter
 - 2) Height
 - 3) Pole thickness
 - 4) Weight
- C. Manufacturer's Instructions:
 - 1. Indicate application conditions and limitations of use stipulated by product testing agency specified under "Regulatory Requirements".
 - 2. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
- D. Light Layout: Provide a computer-generated factory point-by-point foot-candle layout of the project for each area involved.
- E. Post Installation Report: Provide to the Engineer the results of the measured foot-candle level for each area involved.

1.06 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of each luminaire, pole, and underground circuit.

- B. Provide record drawings of the final, as installed and measured, point-by-point foot-candle layout for each area involved.

1.07 OPERATION AND MAINTENANCE DATA

- A. All operations and maintenance data shall comply with the submission and content requirements specified under Section General Requirements.

1.08 COORDINATION

- A. Use bolt templates and pole mounting accessories to install anchor bolts in pole base.

1.09 EXTRA MATERIALS

- A. Provide three (3) percent of each lamp type, but not less than one (1) of each type.
- B. Provide one (1) of each type of LED module, light bar, or array (if applicable). If the LEDs are integrated into the luminaire and are not separate components, then provide one (1) of each of these types of luminaires.
- C. Provide one (1) LED driver of each type.
- D. Provide five (5) percent of total fuses provided for each size, but not less than one (1) of each size.

PART 2 - PRODUCTS

2.01 LUMINAIRES

- A. See the Luminaire Schedule on the drawings for type of luminaires and catalog numbers. Catalog numbers are shown on the drawings for quality and performance requirements only. Luminaires manufactured by others are equally acceptable provided they meet or exceed the performance of the indicated luminaires, and meet the intent of the design.
- B. Luminaire shall be certified by a Nationally Recognized Testing Laboratory (UL, ETL, or IEC).
- C. Provide luminaires with quick-connect disconnecting means, similar to Thomas & Betts Sta-Kon.

2.02 LED LUMINAIRES

- A. LED Luminaires shall meet all DesignLights Consortium® (DesignLights.org) Product Qualification Criteria. This does not require that the luminaire be listed on the DesignLights Consortium's® Qualified Products List, but they must meet

the Product Qualification Criteria. The technical requirements that the luminaire shall meet for each Application Category are:

1. Minimum Light Output.
 2. Zonal Lumen Requirements.
 3. Minimum Luminaire Efficacy.
 4. Minimum CRI.
 5. L70 Lumen Maintenance.
 6. Minimum Luminaire Warranty of 5 years (not pro-rated) to include LED driver and all LED components.
- B. Color Temperature of 3000K-4100K for interior luminaires as listed in the Luminaire Schedule on the Plans. The color temperature of exterior LED luminaires should not exceed 4100K (nominal).
- C. Color Consistency: LED manufacturer shall use a maximum 3-step MacAdam Ellipse binning process to achieve consistent luminaire-to-luminaire color for interior luminaires. Exterior luminaires shall use a maximum 5-step MacAdam Ellipse binning process.
- D. Glare Control: Exterior luminaires shall meet DesignLights Consortium's® criteria for Zonal Lumen Distribution requirements or Backlight-Uplight-Glare (BUG) standards for exterior luminaires.
- E. Luminaire shall be mercury-free, lead-free, and RoHS compliant.
- F. Luminaire shall comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.
- G. Light output of the LED system shall be measured using the absolute photometry method following IES LM-79 and IES LM-80 requirements and guidelines.
- H. Luminaire shall maintain 70% lumen output (L70) for a minimum of 50,000 hours.
- I. Lumen output shall not depreciate more than 20% after 10,000 hours of use.
- J. Luminaire and driver shall be furnished from a single manufacturer to ensure compatibility.
- K. Luminaire Color Rendering Index (CRI) shall be a minimum of 80 for interior luminaires, and a minimum of 70 for exterior luminaires.
- L. LED luminaire shall be thermally designed as to not exceed the maximum junction temperature of the LED for the ambient temperature of the location the luminaire is to be installed. Rated case temperature shall be suitable for operation in the ambient temperatures typically found for the intended installation. Exterior luminaires to operate in ambient temperatures of -40°F to 104°F (-40°C to 40°C).

- M. Luminaire shall operate normally for input voltage fluctuations of plus or minus 10 percent.
- N. Luminaire shall have a maximum Total Harmonic Distortion (THD) of $\leq 20\%$ at full input power and across specified voltage range.
- O. All connections to luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed or shorted during the installation process.
- P. All luminaires shall be provided with knockouts for conduit connections.
- Q. The LED luminaire shall carry a limited 5-year warranty minimum for LED light engine(s)/board array, and driver(s).
- R. Provide all of the following data on submittals:
 - 1. Delivered lumens
 - 2. Input watts
 - 3. Efficacy
 - 4. Color rendering index.
- S. LED Luminaires used for Emergency Egress Lighting: The failure of one LED shall not affect the operation of the remaining LEDs.
- T. Emergency LED Luminaire Compatibility with Inverters: Emergency Inverters shall be sine-wave type, or have written confirmation from the luminaire manufacturer that the luminaire will function with a square-wave inverter.

2.03 LED DRIVERS

- A. General:
 - 1. Provide driver type (non-dimmed, step-dimmed, continuous-dimming, etc.) as indicated on the luminaire schedule on the drawings.
 - 2. Minimum Warranty of 5 years (not pro-rated) to include LED driver and all LED components.
 - 3. Driver shall have a rated life of 50,000 hours, minimum.
 - 4. Driver and LEDs shall be furnished from a single manufacturer to ensure compatibility.
 - 5. Driver shall have a minimum power factor (pf) of 0.9 and a maximum crest factor (cf) of 1.5 at full input power and across specified voltage range.
 - 6. Driver shall operate normally for input voltage fluctuations of plus or minus 10 percent.
 - 7. Driver shall have a maximum Total Harmonic Distortion (THD) of $\leq 20\%$ at full input power and across specified voltage range.
 - 8. Wiring connections to LED drivers shall utilize polarized quick-disconnects for field maintenance.

9. Fuse Protections: All luminaires shall have built-in fuse protection. All power supply outputs shall be either fuse protected or be Polymeric Positive Temperature Coefficient (PTC)-protected as per Class 2 UL listing.
 10. Provide all of the following data on submittals:
 - a. Input watts
 - b. Power Factor (pf)
 - c. Crest Factor (cf) at full input power
 - d. Total Harmonic Distortion (THD).
- B. Dimming Drivers:
1. LED driver shall be compatible with dimming controls where dimming is indicated on the plans. Dimmable drivers shall use Dimming Constant Current (DCC), Constant Voltage, or Pulse Width Modulation (PWM) operation.
 2. Step-Dimming Drivers: Easily switched from 0% to 50% to 100% output power. Both switch-leg inputs shall control 50% of the luminaire's light output equally.
 3. Continuous Dimming Drivers: LED luminaires shall dim to (20%, 15%, 10%, 5%, or 0.1%) as specified in the Luminaire Schedule on the plans without visible flicker or "popcorn effect". "Popcorn effect" is defined as the luminaire being on a pre-set dimmed level (less than 100%), and going to 100% prior to returning to the pre-set level when power is returned to the luminaire. Continuous Dimming Drivers shall use 0-10V control.
- C. Drivers for Bi-Level Switching:
1. Drivers shall be compatible with bi-level switching control by motion sensors where indicated on the drawings.

2.04 MOTION SENSORS FOR BI-LEVEL SWITCHING

- A. Provide luminaires with motion sensors for bi-level switching as indicated on the drawings. Luminaires shall normally operate at a low level during nighttime hours, but shall increase to 100% output when they sense motion. Motion sensor shall be selected based on pole/mounting height, coverage area, and shall be suitable for operation in the ambient temperatures typically found for the intended installation. Luminaire shall be compatible with bi-level switching operation.

2.05 FUSES

- A. Furnish and install a fuse holder and fuse in each ungrounded leg of the electrical circuit supplying the outdoor luminaire. If the voltage is 208, 240, or 480 volts, then the fuse holder needs to be a 2-pole fuse holder which simultaneously disconnects both ungrounded conductors. Every luminaire (including bollards) shall be separately fused with a water-resistant fuse holder. Size the fuse for the amperage of the luminaire. Tap the circuit conductors with a minimum #10 AWG

conductor to serve the luminaire. The fuse and holder shall be accessible through the handhole. Provide sufficient wire to bring fuse holder outside of handhole.

2.06 WIRING CONNECTORS

- A. Wiring Connectors shall meet the requirements of Section 26 05 19 Wiring/Cable, 600 Volts and Under.
- B. Twist-On Wire Connectors: Solderless twist-on spring connectors (wire-nuts) with insulating covers for copper wire splices and taps. All wire connectors used in site lighting applications shall be silicone gel-filled twist connectors or connectors designed for damp and wet locations. Gel-filled twist-on connectors may be used for copper conductor sizes 6 AWG and smaller for site lighting applications. The manufacturer's wire fill capacity must be followed.

2.07 POLES

- A. Provide poles designed for wind loading of 100 miles per hour determined in accordance with AASHTO LTS2 while supporting luminaires having effective projected areas indicated. Poles shall be anchor base type designed for use with underground supply conductors.
- B. Aluminum Poles: Provide aluminum poles manufactured of corrosion resistant aluminum alloys conforming to AASHTO LTS2 for Alloy 6063 T6 or Alloy 6005 T5 for wrought alloys and Alloy 356 T4 (3,5) for cast alloys. Poles shall be seamless extruded or spun seamless type. Provide a pole grounding connection designed to prevent electrolysis when used with copper ground wire.
- C. Handhole: With removable weatherproof cover.
- D. Anchor Bolts: As recommended by pole manufacturer. Provide template, flat washers, lock washers, and hex nuts for each pole.

2.08 FOUNDATIONS

- A. Provide foundations for poles, bollards, and ground-mounted flood and accent lighting. Construct from reinforced concrete in sizes as shown on drawings and to meet the minimum structural requirements of SPS 362.1807 Shallow Post Foundations, and IBC 1807.3 Embedded Posts and Poles.
- B. Place the anchor bolts in pole bases so that the luminaire will be oriented perpendicular to the curb/street/sidewalk/parking lot or as indicated on the plan.
 - 1. Provide a concrete-encased electrode (UFER) grounding system for grounding the foundation, luminaire, and pole:
 - 2. Provide twenty-five (25) feet of #4 bare stranded copper grounding electrode conductor.
 - 3. Extend three (3) feet of the grounding electrode conductor out the top of the foundation for connection to the luminaire/pole.

4. Clamp the grounding electrode conductor to the top of the rebar cage. Use a clamp rated for such use such as an Erico EK16 or similar.
 5. Spiral a minimum of ten (10) feet of the grounding electrode conductor around the outside of the rebar cage.
 6. Loop the remaining conductor around the rebar cage at the bottom of the foundation in direct contact with earth.
- C. The exposed surface area of the foundation shall have the forms removed and the concrete rubbed out to a smooth finish.
- D. Pole Base J-Boxes: For pole bases with multiple conduits to other poles/locations, the contractor may provide a non-metallic j-box with a curved cover mounted in the side of the exposed part of the base to accommodate the multiple conduits. Boxes shall be NEMA 3R Carlon Nonmetallic Curved Lid J-Boxes or equal. Mount j-box centered at 20" above grade. Use only in poles 18" in diameter and larger. Locate boxes 90-degrees or 180-degrees from traffic. Install boxes per manufacturer's recommendations.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Wood Poles: Stack poles stored for more than 2 weeks on creosoted or decay resisting skids arranged to support the poles without producing noticeable distortion. Pile poles to permit free circulation of air; the bottom poles of the piles shall be at least 1 foot above ground level or any growing vegetation. Do not permit decayed or decaying wood to remain underneath stored poles. Do not drag treated poles along the ground. Do not use pole tongs, cant hooks, and other pointed tools capable of producing indentation more than 1 inch in depth in handling the poles. Do not apply tools to the ground line section of any pole. The ground line section is that portion between 1 foot above and 2 feet below the ground line.
- B. Aluminum and Steel Poles: Provide anchor bases with galvanized steel anchor bolts, threaded at the top end and bent 90 degrees at the bottom end. Provide galvanized nuts, washers, and ornamental covers for anchor bolts. Thoroughly compact backfill with compacting arranged to prevent any pressure between conductor, jacket, or sheath and the end of conduit ell. Adjust poles as necessary to provide a permanent vertical position with the bracket arm in proper position for luminaire location. After installation, paint the exposed surfaces of steel poles with two finish coats of exterior oil paint of a color as indicated.
- C. Pole Setting: Depth shall be as indicated. Dig holes large enough to permit the proper use of tampers to the full depth of the hole. Place backfill in the hole in 6 inch maximum layers and thoroughly tamp. Place surplus earth around the pole in a conical shape and pack tightly to drain water away.

- D. Install in accordance with manufacturers' instructions.
- E. Minimum underground conduit size is 1 inch unless otherwise indicated.
- F. Underground and exterior wire shall be minimum #8 AWG conductors, type XHHW-2 or USE-2. #10 AWG conductors shall be utilized for vertical wire installed within pole and for overall circuit lengths of less than 100 LF.
- G. Protect anchor bolts 2 inches (50 mm) minimum above base.
- H. Install all anchor bolts and handhole fasteners with anti-seize compound.
- I. Install poles plumb. Provide shims or double nuts to adjust plumb.
- J. Use belt slings or non-chafing ropes to raise and set pre-finished luminaire poles.
- K. Bond each luminaire, each metal accessory, the ground rod and the pole to the branch circuit equipment ground conductor with a separate ground wire sized per NEC or as shown on the drawings.
- L. Dimmed luminaire circuits shall have separate neutrals.
- M. Dimmed luminaires shall have a positive OFF, which requires turning off the circuit to the luminaire so that the luminaires do not "glow" at the lowest dimmed setting. This shall be accomplished using a switch, relay, or some other means acceptable to Engineer.

3.02 FIELD QUALITY CONTROL

- A. Operate each luminaire after installation and connection. Inspect for improper connections and operation.

3.03 ADJUSTING

- A. Aim and adjust luminaires as indicated on drawings or as required to meet the performance specifications.
- B. All new lamps shall be operational at the Substantial Completion of the project.
- C. Adjust motion sensors to provide proper coverage for bi-level switching operation.

3.04 CLEANING

- A. Clean photometric control surfaces.
- B. Clean finishes and touch up damage.

END OF SECTION

SECTION 31 05 13

SOILS FOR EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. General Fill.
 - 2. Topsoil.

1.02 REFERENCE STANDARDS

- A. The following is a list of standards that may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - b. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - c. D4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - d. D4972, Standard Test Method for pH of Soils.
 - e. D6913, Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
 - f. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.
 - g. D7928, Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis.
 - h. F1647, Standard Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes.

1.03 SUBMITTALS

- A. Comply with Section 01 33 00, Submittal Procedures.
- B. Action submittals:
 - 1. Submit gradations and sieve analyses, Atterberg limits, and Proctor densities to demonstrate conformance with these requirements.
 - 2. Submit name of imported materials source.
 - 3. Submit mineral analysis and nutrient content.

- C. Informational submittals:
 - 1. Copies of agreements between Contractor and private landowner accepting spoil material.

1.04 QUALITY ASSURANCE

- A. Furnish each General Fill and/or topsoil material from single source throughout Work.

PART 2 - PRODUCTS

2.01 FILL AND BACKFILL MATERIALS

- A. Material specifications included herein are designated as “fill” materials and apply to both fill and backfill unless otherwise specified.
- B. General Fill:
 - 1. Excavated and reused material, graded.
 - 2. Free of lumps larger than 3 inches, rocks larger than 4 inches in any dimension, debris, roots wood, scrap material, vegetable matter, refuse, soft unsound particles, frozen deleterious, or other objectionable materials.
 - 3. Conforming to ASTM D2487 Group Symbol GW, GM, GC, SW, SM, or ML, or as otherwise approved by the Engineer.
- C. Imported General Fill:
 - 1. Bank run gravel, conforming to NYSDOT 733-11.
 - 2. Percent passing by weight per sieve size:
 - a. 4-inch: 100.
 - b. No. 40: 0 to 70.
 - c. No. 200: 0 to 15.
- D. Borrow Material: When insufficient job-excavated material is available, off-site borrow material meeting the requirements of General Fill and Imported General Fill may be used.

2.02 TOPSOIL MATERIALS

- A. Native topsoil:
 - 1. Excavated and reused material, graded.
 - 2. Free of roots, rocks larger than 2 inch, subsoil, debris, large weeds and foreign matter.
 - 3. Screening: Double screened.
 - 4. Conforming to ASTM D2487 Group Symbol OH or PT.
 - 5. Acidity range (pH) of 5.5 to 7.6.
 - 6. Containing minimum of 4 percent and maximum of 20 percent organic matter.

- B. Imported topsoil:
 - 1. Imported borrow, from approved borrow site.
 - 2. Friable loam.
 - 3. Reasonably free of roots, rocks larger than 2 inch, subsoil, debris, large weeds, and foreign matter.
 - 4. Screening: Double screened.
 - 5. Acidity range (pH) of 5.5 to 7.6.
 - 6. Containing minimum of 4% and a maximum of 20% of organic material.
 - 7. Conforming to ASTM D2487 Group Symbol OH or PT.

2.03 SOURCE QUALITY CONTROL

- A. Furnish materials of each type from the same source throughout Work.
- B. Testing and analysis of topsoil: Perform in accordance with ASTM D2487, ASTM F1647, and ASTM D4972.
- C. When tests indicate materials do not meet specified requirements, change material and retest.
- D. Furnish materials of each type from same source throughout Work.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Excavate subsoil and/or topsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.
- B. All sod cut during excavation shall be removed and stored during construction so as to preserve the grass growth, and shall be replaced in position on completion of the Work.
- C. Stockpile excavated material meeting requirements for General Fill materials and topsoil materials.
- D. Remove excess excavated materials not intended for reuse from the Site.
- E. All spoil materials shall be lawfully disposed off-site at appropriate locations selected and obtained by Contractor.
- F. No environmentally sensitive areas shall be used for spoil areas.
- G. Comply with requirements for stockpile storage included in the NYS Stormwater Permit for Construction Activity.

- H. A copy of the signed agreement between the property owner and Contractor granting permission to deposit spoil shall be submitted to Engineer prior to placement.
- I. Remove excavated materials not meeting requirements for General Fill materials, and topsoil materials from the Site.

3.02 HAULING MATERIAL

- A. When it is necessary to haul material over the streets or pavements, Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements.
- B. In all cases where any materials are dropped from the vehicles, Contractor shall clean up the same at least daily or as often as directed and keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled materials.

3.03 STOCKPILING

- A. Stockpile materials on Site at locations designated and approved by Engineer and as otherwise required by Contract Documents.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. All excavation materials shall be stored in locations as to not endanger the Work, and so that easy access may be had at all times to all parts of the excavation.
- D. Separate differing materials with dividers or stockpile apart to prevent mixing.
- E. Stockpile topsoil 8 feet high, maximum.
- F. Prevent intermixing of soil types or contamination.
- G. Direct surface water away from stockpile sites to prevent erosion or deterioration of materials.
- H. Stockpile unsuitable materials on impervious material and cover to prevent erosion and leaching, until disposed.
- I. All excavated materials shall be kept clear of sidewalks, driveway entrances/exits, street crossings, and any other points that may inconvenience the public.
- J. Special precautions must be taken to permit access at all times to fire hydrants, fire alarm boxes, police and fire department driveways, and other points of public convenience.
- K. Where traffic is to be maintained, at least one-half of the street width must be kept open at all times.

- L. Approved types of bridging across trenches shall be constructed and maintained where necessary.
- M. Where conditions do not allow for storage of materials, materials excavated from the first 100 feet of any opening, or from such additional length as may be required, shall be removed from the street by Contractor as soon as excavated.
- N. The material subsequently excavated shall be used to refill the trench where the utility has been built, provided it fulfills the requirements for fill materials.
- O. If more material is excavated from any trench, excavation, or pit than can be refilled over the completed work or stored on the street, leaving space for traffic as herein provided, or within the limits of the right-of-way, the excess material shall be spoiled at locations selected and obtained by Contractor.
- P. When the facility is complete, Contractor shall bring back adequate amounts of satisfactory excavated materials as may be required to properly refill the trenches, excavations, or pits.
- Q. If directed by Engineer, Contractor shall refill such trenches, excavations, or pits with special backfill or other suitable materials, and excess excavated materials shall be disposed as spoil.

3.04 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade Site surface to prevent free standing surface water.
- B. When borrow area is indicated, leave area in clean and neat condition.
- C. Grade Site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 05 16

AGGREGATES FOR EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes material requirements and gradations for all unbound aggregates required by the Contract Documents.
- B. Aggregate mixes including in this specification include:
 - 1. Granular Fill.
 - 2. Pipe Bedding.
 - 3. Structural Fill.
 - 4. Drainage Fill.
 - 5. Sand Fill.
 - 6. Stone Dust Topping.
 - 7. Tank, Sump, and Piping Manufacturer Specified Fill

1.02 REFERENCE STANDARDS

- A. The following is a list of standards that may be referenced in this Section:
 - 1. American Association of State Highway Transportation Officials (AASHTO):
 - a. M147, Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
 - b. T180, Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.
 - 2. ASTM International (ASTM):
 - a. C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
 - b. C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - c. D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³).
 - d. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³).
 - e. D2487, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - f. D4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.03 SUBMITTALS

- A. Comply with Section 01 33 00, Submittal Procedures.

- B. Materials Source: Name of imported materials Suppliers.

1.04 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout Work.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All granular materials shall be free from any organic or other deleterious materials.
- B. The quality of the gravel or stone particles shall be demonstrated per ASTM C88.
- C. The maximum weight loss at four (4) cycles shall be 20 percent.

2.02 MATERIALS

- A. Granular Fill:
1. Crusher run gravel, conforming to NYSDOT 733-04, Type 2 or Type 4.
 2. Percent passing by weight per sieve size:
 - a. 2-inch: 100.
 - b. 1/4-inch: 25 to 65.
 - c. No. 40: 5 to 40.
 - d. No. 200: 0 to 10.
- B. Pipe Bedding:
1. Shall consist of clean, sound, crushed stone and shall be free from coatings.
 2. Conform to manufacturer installation requirements; otherwise conform to NYSDOT 703-02 for coarse aggregate requirements.
 3. NYSDOT No. 1 Stone Gradation, Table 703-4:
 - a. Percent passing by weight per sieve size:
 - 1) 1 inch: 100.
 - 2) 1/2 inch: 90 to 100.
 - 3) 1/4 inches: 0 to 15.
 - 4) No. 200: 0 to 1.
- C. Structural Fill:
1. Shall consist of clean, sound crushed stone and shall be free from coatings.
 2. Shall conform to NYSDOT 703-02 for coarse aggregate requirements.
 3. NYSDOT No. 2 Stone Gradation, Table 703-4:
 - a. Percent passing by weight per sieve size:
 - 1) 1-1/2 inch: 100.
 - 2) 1 inch: 90 to 100.
 - 3) 1/2 inch: 0 to 15.

- 4) No. 200: 0 to 1.

D. Drainage Fill:

1. Natural stone pea gravel, washed, free of clay, shale, organic matter; graded according to ASTM C136; to following limits:
 - a. Minimum Size: 1/8 inch.
 - b. Maximum Size: 3/8 inch.

E. Sand Fill:

1. Clean, hard, durable, uncoated particles, free from clay lumps and all deleterious substances.
2. Cushion sand, conforming to NYSDOT 703-06
3. Dry gradation, per Table 703-9:
 - a. Percent passing by weight per sieve size:
 - 1) 1/4-inch: 100.
 - 2) No. 50: 0 to 35.
 - 3) No. 100: 0 to 10.

F. Stone Dust Topping:

1. Limestone crusher fines.
2. Percent passing by weight per sieve size:
 - a. 3/8 inch: 100.
 - b. 1/4 inch: 65.
 - c. 3/16 inch: 50.
 - d. 1/8 inch: 35.
 - e. 1/16 inch: 25.

G. Tank, Sump, and Piping Manufacturer Specified Fill:

1. Refer to manufacturer specific installation instructions.

2.03 SOURCE QUALITY CONTROL

- A. Coarse Aggregate Material, Testing and Analysis: Perform sieve analysis, plasticity index, and soundness tests in accordance with ASTM C136, ASTM D4318.
- B. When tests indicate materials do not meet specified requirements, change material and retest at Contractor's expense.

PART 3 - EXECUTION

3.01 HAULING MATERIAL

- A. When it is necessary to haul material over the streets or pavements, Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements.

- B. In all cases where any materials are dropped from the vehicles, Contractor shall clean up the same at least daily or as often as directed and keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled material.

3.02 STOCKPILING

- A. Stockpile materials on Site at locations designated on the Drawings, the NYS General Stormwater Permit for Construction Activities, or as otherwise approved by Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.
- E. Stockpile unsuitable materials on impervious material and cover to prevent erosion and leaching, until disposed.

3.03 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition.
- B. Grade Site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 22 13

SUBGRADE PREPARATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Cutting, grading, filling, rough contouring, and compacting Site for structures, building pads, features, and roadways.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
 - 1. ASTM International (ASTM):
 - a. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
 - b. D5519, Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials.
 - c. D6913, Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
 - d. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.
 - e. D7928, Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Graded Soils Using the Sedimentation (Hydrometer) Analysis.

1.03 SUBMITTALS

- A. Informational submittals:
 - 1. Submit field Proctor curves for each subgrade soil type to be prepared.

1.04 DEFINITIONS

- A. Optimum moisture content: As defined in Section 31 23 23, Fill.
- B. Prepared ground surface: Ground surface after completion of clearing and grubbing, scalping of sod, stripping of topsoil, excavation to grade and scarification and compaction of subgrade.
- C. Relative compaction: As defined in Section 31 23 23, Fill.
- D. Subgrade: Layer of existing soil after completion of clearing, grubbing, scalping of topsoil prior to placement of fill, roadway structures or base for floor slab.

- E. Proof-rolling: Testing of subgrade by compactive effort to identify areas that will not support the future loading without excessive settlement.

1.05 SCHEDULING AND SEQUENCING

- A. Complete applicable Work specified in Section 02 40 00, Demolition and Removal; and Section 31 23 16, Excavation, prior to subgrade preparation.
- B. Prepare subgrade when unfrozen and free of ice and snow.

1.06 QUALITY ASSURANCE

- A. Notify the Engineer when subgrade is ready for compaction or proof-rolling or whenever compaction or proof-rolling is resumed after a period of extended inactivity.

PART 2 - PRODUCTS

(Not used)

PART 3 - EXECUTION

3.01 GENERAL

- A. Verify survey bench mark and intended elevations for Work are as indicated.
- B. Keep subgrade free of water, debris and foreign matter during compaction or proof-rolling.
- C. Bring subgrade to proper grade and cross-section and uniformly compact surface.
- D. Do not use sections of prepared ground as haul roads. Protect prepared subgrade from traffic.
- E. Maintain prepared ground surface in finished condition until next course or lift is placed.

3.02 FIELD PROCTORS

- A. Contractor shall collect representative samples of the subgrade soils to be prepared for improvement and send to an approved soils laboratory for determination maximum consolidation and optimum moisture in accordance with ASTM D1557.
- B. The Contractor shall determine optimum moisture and maximum density for each soil type incorporated into the Work and when the same subsoils are sourced from different suppliers.

3.03 PREPARATION

- A. Comply with 16 NYCRR 753 and call UDIG NY not less than three working days before performing Work.
- B. Request underground utilities to be located and marked within and surrounding construction areas.
- C. Identify required lines, levels, contours, and datum.
- D. Protect utilities and/or site features indicated to remain from damage.
- E. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- F. Protect bench marks from excavating equipment and vehicular traffic.

3.04 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be further excavated, or regraded.
- B. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.
- C. When excavating through roots, perform Work by hand and cut roots with sharp axe.
- D. Stockpile subsoil in area designated on Site to depth not exceeding 8 feet and protect from erosion.

3.05 FILLING

- A. Fill areas to contours and elevations with unfrozen materials.
- B. Tolerances: Top surface of subgrade shall be filled to +/-0.10 foot from Drawing elevation.

3.06 COMPACTION

- A. Under Unpaved Areas:
 - 1. Three passes with three-wheeled power roller weighing approximately 10 tons.
- B. Under Pavement Structure, Floor Slabs on Grades, or Granular Fill Under Structures: Compact the 6-inch to minimum 95 percent of the Modified Proctor.

3.07 MOISTURE CONDITIONING

- A. Acceptable subgrade moisture range shall be between +3% and -2% of Optimum Moisture, as determined by the field Proctor.
- B. Dry subgrade: Add water, then mix to make moisture content uniform throughout.
- C. Wet subgrade: Aerate material by blading, disking, harrowing, or other methods to hasten the drying process.

3.08 FIELD QUALITY CONTROL

- A. Proof-roll subgrade with equipment specified herein to detect soft or loose subgrade or unsuitable material.
- B. Suitability determination:
 - 1. Test soft areas identified through proof-rolling for Optimum Moisture and density, per ASTM D6938.
 - 2. Demonstrate that material meets the definition of General Fill, per Section 31 05 13, Soils for Earthwork.
 - 3. Unsuitable subgrade:
 - a. If moisture is within optimum tolerances established by the field Proctors and the material is still yielding under compactive effort, relative to adjacent subgrade, then the material will be deemed unsuitable.
 - b. Notify the Engineer of unsuitable material prior to over-excavation.
- C. Perform laboratory material tests according to ASTM D1557 and ASTM D422.
- D. Perform in place compaction tests according to following:
 - 1. Density and moisture tests: ASTM D6938.
- E. Minimum frequency of testing: Every 500 square feet of the prepared subgrade.

3.09 CORRECTIVE ACTION

- A. Soft or loose subgrade:
 - 1. Over-excavate the unsuitable material to no deeper than 2 feet, in accordance with Section 31 23 16, Excavation.
 - 2. Line over-excavation with soil stabilization fabric, backfill with Granular Fill, and compact to maximum density.
 - 3. Notify Engineer if unsuitable material extends to greater than 2 feet deep.

END OF SECTION

SECTION 31 23 16

EXCAVATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes performance requirements for excavation required to construct structures and utilities as shown on the Drawings.
- B. Excavation, in open cut, includes the loosening, removing, transporting, storage and disposal of all materials necessary to be removed for the construction and completion of all Work under the Contract.
- C. Compliance with 16 NYCRR 753:
 - 1. All excavation work shall be performed in accordance with 16 NYCRR 753, Protection of Underground Facilities.
 - 2. All operators operating excavating equipment under this contract shall be certified under the UDIG NY Certified Excavator Program.

1.02 QUALITY ASSURANCE

- A. Survey control:
 - 1. Provide adequate survey control to avoid unauthorized over-excavation.
 - 2. Identify required lines, levels, contours, and datum.

1.03 SUBMITTALS

- A. Informational submittals:
 - 1. Excavation plan, detailing the following:
 - a. Method and sequencing information.
 - b. Proposed locations of stockpiled excavated materials.
 - c. Proposed on-site and off-site spoil disposal sites.
 - d. Number, types, and sizes of equipment proposed to perform excavations.
 - e. Reclamation of on-site spoil disposal areas.

1.04 WEATHER LIMITATIONS

- A. Material excavated when frozen or when air temperature is less than 32 degrees F shall not be used as fill or backfill until material completely thaws.
- B. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

1.05 SEQUENCING AND SCHEDULING

- A. Comply with 16 NYCRR 753 and call UDIG NY not less than three working days before performing Work.
- B. Request underground utilities to be located and marked within and surrounding construction areas.
- C. Coordinate activities with utility owners.
- D. Demolition: Coordinate Work as shown and as specified in Section 024000, Demolition and Removal with excavations.
- E. Excavation support: Install and maintain as necessary to support sides of excavations and prevent detrimental settlement and lateral movement of existing facilities, adjacent property, and completed Work.

1.06 DEFINITIONS

- A. Earth: all materials such as sand, gravel, clay loam, pavements, ashes, cinders, mulch, roots, or pieces of timber, rippable rock, not requiring blasting, barring or wedging from its original bed, and specifically excludes all ledge and bed rock and individual boulders, concrete, or masonry larger than one-half cubic yard in volume.
- B. Backfill: selected materials for the backfilling of excavations and trenches up to the original surface of the ground or to other grades as may be shown or directed.
- C. Spoil: surplus excavated materials not required or not suitable for backfills or embankments.
- D. Embankments: fills constructed of selected materials above the original surface of the ground.
- E. Rock: ledge or bedrock requiring blasting, barring, or wedging from its original bed and individual boulders, concrete or masonry larger than one-half cubic yard in volume.

PART 2 - PRODUCTS

(Not used)

PART 3 - EXECUTION

3.01 GENERAL

- A. Perform all excavations in accordance with 16 NYCRR 753.

- B. Excavations shall be in accordance with details of applicable codes, rules, Laws and Regulations, including the Occupational Safety and Health Administration (OSHA) Title 29 Code of Federal Regulations (CFR) Part 1926, Subpart P – Excavations.
- C. Designate a “Competent Person” who shall be responsible for inspections of excavations on a daily basis and document and maintain daily trenching and excavation logs per OSHA 29 CFR 1926.
- D. Excavate to lines, grades, and dimensions shown and as necessary to accomplish the Work.
 - 1. Excavate to within tolerance of +/-0.1 foot, except where dimensions or grades are shown or specified as maximum or minimum.
 - 2. Allow for forms, sheeting/shoring, dewatering, working space, granular base, topsoil, and similar items, wherever applicable.
 - 3. Trim to neat lines where concrete is to be deposited against earth.
- E. Slope banks with machine to angle of repose or less until shored.
- F. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- G. Overexcavation:
 - 1. Do not overexcavate without written authorization of Engineer.
 - 2. Backfill unauthorized overexcavations with material as directed by Engineer at no additional cost to Owner.
- H. Notify utility company to remove and relocate utilities.
- I. Repair or replace items indicated to remain damaged by excavation.
- J. Use of explosives is not permitted.
- K. Notify Engineer of unexpected subsurface conditions.

3.02 EXCAVATION FOR STRUCTURES

- A. Excavate to specified foundation elevation utilizing a flat bottom bucket.
- B. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity in accordance with Section 31 23 23, Fill.
- C. Bearing capacity of footing subgrades shall be verified by a geotechnical engineer.
- D. Soft spots or soil that is determined to have inadequate capacity shall be overexcavated and replaced as specified in Section 310516, Aggregates for Earthwork and placed and compacted in accordance with Section 31 23 23, Fill.

- E. Footing subgrades that become saturated or unstable shall be over excavated 6-inches and replaced with a 6-inch layer of Structural Fill.
- F. Provide 12 inches minimum clearance between excavation faces and footing formwork.
- G. Under cutting excavation faces for extended footings is not permitted.

3.03 UNCLASSIFIED EXCAVATION

- A. Excavation is unclassified.
- B. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

3.04 EMBANKMENT AND CUT SLOPES

- A. Shape, trim, and finish embankments and cut slopes to conform to lines, grades, and cross-sections shown, with proper allowance for topsoil or slope protection, where shown.
- B. Remove stones and rock that exceeds 3-inch diameter and that are loose and may roll down slope.
- C. Remove exposed roots from cut slopes.
- D. Round tops of cut slopes in soil to not less than 6-foot radius, provided such rounding does not extend off-site or outside easements and rights-of-way, or adversely impacts existing facilities, adjacent property or completed Work.

3.05 STOCKPILING EXCAVATED MATERIAL

- A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.
- B. Post signs indicating proposed use of material stockpiled.
 - 1. Signs shall be readable from all directions of approach to each stockpile.
 - 2. Signs shall be clearly worded and readable by equipment operators from their normal seated position.
- C. Confine stockpiles to within easements, rights-of-way, and approved work areas.
- D. Do not obstruct roads or streets.
- E. Do not stockpile excavated material adjacent to trenches and other excavations, unless excavation side slopes and excavation support systems are designed, constructed, and maintained for stockpile loads.

- F. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed Work, if weight of stockpiled material could induce excessive settlement.
- G. Do not stockpile excavated material within the drip line of existing trees.

3.06 FIELD QUALITY CONTROL

- A. Perform inspection of excavation and controlled fill operations to confirm stability and accordance with OSHA standards and Laws and Regulations.
- B. Footing subgrades shall be verified for specified bearing capacity under all buildings by a geotechnical engineer.

3.07 PROTECTION

- A. Underpin adjacent structures which may be damaged by excavation work.
- B. Prevent displacement or loose soil from falling into excavation
 1. Maintain soil stability.
 2. All material which slides, falls, or caves into excavation due to any cause whatsoever shall be removed and disposed off-site.
- C. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing, oversaturation, and construction traffic.
- D. Protect structures, utilities and other facilities indicated to remain from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.
- E. Protect plant life, lawns, rock outcroppings and other features remaining as portion of final landscaping.
- F. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving and curbs from excavating equipment and vehicular traffic.
- G. Repair or replace items indicated to remain damaged by excavation.

3.08 DISPOSAL OF SPOIL

- A. Lawfully dispose of excavated materials which are unsuitable or exceed quantity needed for fill or backfill off-site.
- B. Dispose of debris resulting from removal of underground facilities, as specified in Section 02 40 00, Demolition and Removal and Section 02 65 00.20, Petroleum Bulk Storage Tank Demolition and Removal for demolition debris.

END OF SECTION

SECTION 31 23 23

FILL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Backfilling Site structures to subgrade elevations.
 - 2. Fill under paving.
 - 3. Fill for over-excavation.
- B. Related Work specified elsewhere:
 - 1. Section 31 05 13, Soils for Earthwork.
 - 2. Section 31 05 16, Aggregates for Earthwork.
 - 3. Section 31 22 13, Subgrade Preparation

1.02 REFERENCE STANDARDS

- A. ASTM International (ASTM):
 - 1. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft).
 - 2. D6938, Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.03 SUBMITTALS

- A. Material source: Submit name of imported fill materials suppliers.

1.04 DEFINITIONS

- A. Optimum moisture: the moisture content in a cohesive soil that results in a maximum compacted density, in accordance with ASTM D1557.
- B. Relative compaction:
 - 1. The reduction in volume of aggregates and aggregate mixes after vibratory compaction, expressed as a percent volume reduction from a loose, dumped state to a compacted state.
 - 2. Relative compaction is only measured on cohesionless soils.

PART 2 - PRODUCTS

2.01 FILL MATERIALS

- A. General Fill: As specified in Section 31 05 13, Soils for Earthwork.

- B. Structural Fill: As specified in Section 31 05 16, Aggregates for Earthwork.
- C. Granular Fill: As specified in Section 31 05 16, Aggregates for Earthwork.

2.02 ACCESSORIES

- A. Geotextile Fabric: Non-biodegradable, non-woven as shown on the Drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that sub-drainage, dampproofing, or waterproofing installation has been inspected.
- B. Verify underground tanks are anchored to their own foundations to avoid flotation after backfilling.
- C. Verify structural ability of unsupported walls to support loads imposed by fill.

3.02 PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Unsuitable Materials:
 - 1. Cut out soft areas of subgrade not capable of compaction in place.
 - 2. Backfill with Granular Fill and compact to density equal to or greater than requirements for subsequent fill material.
- C. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

3.03 BACKFILLING

- A. Backfill areas to contours and elevations with unfrozen materials.
- B. Systematically backfill to allow maximum time for natural settlement.
- C. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- D. Place material in continuous layers as follows if not specified elsewhere:
 - 1. General Fill: Maximum 8 inches compacted depth.
 - 2. Structural Fill: Maximum 6 inches compacted depth.
 - 3. Granular Fill: Maximum 6 inches compacted depth.
- E. Compaction:

1. Underneath Structures, Paving, Final Backfill for Trenches, and all Other Areas Not Specifically Identified: Compact to at least 95 percent of its maximum density, as determined by ASTM D1557.
 2. Underneath Sidewalks and Grassed Areas: Compact to at least 90 percent of its maximum density, as determined by ASTM D1557.
- F. Employ placement method that does not disturb or damage other Work.
- G. Maintain optimum moisture content of backfill materials to attain required compaction density.
- H. Remove surplus backfill materials from Site at no additional cost to Owner.
- I. Leave fill material stockpile areas free of excess fill materials.

3.04 TOLERANCES

- A. Top surface of backfilling under paved areas: Plus or minus 1 inch from required elevations.
- B. Top Surface of general backfilling: Plus or minus 1 inch from required elevations.

3.05 FIELD QUALITY CONTROL

- A. Perform laboratory material tests according to ASTM D1557.
- B. Perform in place compaction tests according to following:
1. Density tests: in accordance with ASTM D6938.
 2. Moisture Tests: in accordance with ASTM D6938.
- C. When tests indicate Work does not meet specified requirements, remove Work, replace, and retest.
- D. Frequency of Tests: once per lift.
- E. Proof roll compacted fill surfaces under paving.

3.06 PROTECTION OF FINISHED WORK

- A. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes all material and performance requirements for asphalt paving materials as called on the Drawings, including:
 - 1. Asphalt paving base course.
 - 2. Binder course.
 - 3. Top course.
 - 4. Tack coats.

1.02 REFERENCE STANDARDS

- A. The following is a list of standards which may be referenced in this Section:
 - 1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. M17, Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
 - b. M81, Standard Specification for Cut-Back Asphalt (Rapid Curing Type).
 - c. M82, Standard Specification for Cut-Back Asphalt (Medium Curing Type).
 - d. M140, Standard Specification for Emulsified Asphalt.
 - e. M208, Standard Specification for Cationic Emulsified Asphalt.
 - f. T166, Standard Method of Test for Bulk Specific Gravity of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens.
 - g. T176, Standard Method of Test for Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test.
 - h. T230, Standard Method of Test for Determining Degree of Pavement Compaction of Bituminous Aggregate Mixtures.
 - i. T245, Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.
 - j. T246, Standard Method of Test for Resistance of Deformation and Cohesion of Bituminous Mixtures by Means of Hveem Apparatus.
 - k. T247, Standard Method of Test for Preparation of Test Specimens of Bituminous Mixtures by Means of California Kneading Compactor.
 - l. T283, Standard Method of Test for Resistance of Compacted Bituminous Mixture to Moisture-Induced Damage.
 - m. T304, Standard Method of Test for Uncompacted Void Content of Fine Aggregate (Method A).

2. Asphalt Institute (AI):
 - a. Manual Series No. 2 (SP-2), Mix Design Methods for Asphalt Concrete.
 - b. Superpave Series No. 2 (SP-2), Superpave Mix Design.
3. ASTM International (ASTM):
 - a. D4318, Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - b. D4791, Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
 - c. D5281, Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.
 - d. E329, Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.
4. State of New York Department of Transportation, Standard Specifications.

1.03 DEFINITIONS

- A. Combined aggregate: All mineral constituents of asphalt concrete mix, including mineral filler and separately sized aggregates.
- B. Standard Specifications: State of New York Department of Transportation (NYSDOT) Standard Specifications.

1.04 DESIGN REQUIREMENTS

- A. All thicknesses of pavement courses described herein or shown on the Drawings represent compacted thicknesses.

1.05 SUBMITTALS

- A. Informational submittals:
 1. Test report for asphalt concrete:
 - a. Submit a minimum 10 days prior to start of production.
 - b. Show appropriate test method(s) for each material and the test results.
 2. Manufacturer's Certificate of Compliance for the following materials:
 - a. Aggregate: gradation, source test results as defined in Section 703 of the NYSDOT Standard Specifications.
 - b. Asphalt for binder: Type, grade, and viscosity-temperature curve.
 - c. Tack coat: Type and grade of asphalt.
 - d. Additives.
 - e. Mix: Conforms to job-mix formula.
 3. Statement of qualification for independent testing laboratory.
 4. Test results:
 - a. Mix design.
 - b. Asphalt concrete core.
 - c. Gradation and asphalt content of uncompacted mix.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with the Standard Specifications as amended and/or supplement herein.
- B. Qualifications:
 - 1. Independent Testing Laboratory: In accordance with ASTM E329.
 - 2. Asphalt concrete mix formula shall be prepared by approved, certified independent laboratory under the supervision of a certified asphalt technician.

1.07 AMBIENT CONDITIONS

- A. Weather and seasonal limitations shall comply with the Standard Specifications. NYSDOT Standard Specifications Section 402-3.01.

PART 2 - PRODUCTS

2.01 MATERIALS – NEW YORK STATE

- A. Mixtures: designed in accordance with NYSDOT standards:
 - 1. Top Course: 9.5 mm Superpave F2 Top Course HMA.
 - 2. Binder Course: 19.0 mm F9 Binder Course HMA.
 - 3. Base Course: 37.5 mm F9 Base Course HMA.
 - 4. Subbase Course: Item 304.12, Subbase Course, Type 2
- B. Tack coat:
 - 1. Shall be applied between all lifts of HMA courses and where new asphalt meets existing asphalt or concrete.
 - 2. Comply with the requirements of NYSDOT Section 702 Bituminous Materials

2.02 ASPHALT CONCRETE MIX – NEW YORK STATE

- A. General:
 - 1. Mix formula shall not be modified except with written approval of the Engineer.
 - 2. Source changes:
 - a. Should material source(s) change, establish new asphalt concrete mix formula before new material(s) is used.
 - b. Perform check tests of properties of plant-mix bituminous materials on first day of production and as requested by the Engineer to confirm that properties are in compliance with design criteria.
 - c. Make adjustments in gradation or asphalt content as necessary to meet design criteria.

- B. Asphalt concrete: as specified in Section 403 of the Standard Specifications.
- C. Composition:
 - 1. Hot-mix asphalt plant of aggregate, mineral filler if required, and paving grade asphalt cement.
 - 2. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that resulting mixture meets grading requirements of the mix.
- D. Aggregate:
 - 1. General: as specified in Section 703 of the Standard Specifications.
 - 2. RAP will not be acceptable.
- E. Mineral filler: in accordance with Section 703-08 of the Standard Specifications.
- F. Asphalt cement: Paving grades 18-60, as specified in Section 702 of the Standard Specifications.

PART 3 - EXECUTION

3.01 GENERAL

- A. Traffic control:
 - 1. Minimize inconvenience to traffic, but keep vehicles off freshly-treated or paved surfaces to avoid pickup and tracking of asphalt.
- B. Driveways: Repave driveways from which pavement was removed. Leave driveways in as good or better condition than before start of construction.

3.02 LINE AND GRADE

- A. Provide and maintain intermediate control of line and grade, independent of underlying base, to meet finish surface grades and minimum thickness.
- B. Shoulders: Construct to line, grade, and cross-section shown.

3.03 APPLICATION EQUIPMENT

- A. In accordance with the Standard Specifications.

3.04 PREPARATION

- A. Prepare subgrade and subbase in accordance with the Standard Specifications and as supplemented herein.

- B. Existing Roadways:
 - 1. Modify profile by grinding, milling, or overlay methods as approved, to provide meet lines and surfaces and to produce smooth riding connection to existing facilities.
 - 2. Remove existing material to a minimum depth of 1 inch.
 - 3. Paint edges to meet line with tack coat prior to placing new pavement.
- C. Thoroughly coat edges of contact surfaces (curbs, manhole frames) with emulsified asphalt or asphalt cement prior to laying new pavement. Prevent staining of adjacent surfaces.

3.05 PAVEMENT APPLICATION

- A. General: Place asphalt concrete mixture on approved, prepared subbase or base as applicable in accordance with the Standard Specifications and as shown on the Drawings.
- B. Tack coat:
 - 1. Prepare material, as specified in the Standard Specifications prior to application.
 - 2. Apply uniformly to clean, dry surfaces avoiding overlapping of applications.
 - 3. Do not apply more tack coat than necessary for the day's paving operation.
 - 4. Touch up missed or lightly-coated surfaces and remove excess material.
 - 5. Application rate: Minimum 0.05 to 0.15 gallons per square yard of asphalt (residual if diluted emulsified asphalt) of surface area or as specified in the Standard Specifications, whichever is greater.
- C. Pavement mix:
 - 1. Prior to paving:
 - a. Sweep primed surface free of dirt, dust, or other foreign material.
 - b. Patch holes in tack-coated surface with asphalt concrete pavement mix.
 - c. Blot excess tack material with sand.
 - 2. Total compacted thickness: As shown on the Drawings.
 - 3. Apply such that meet lines are straight and edges are vertical.
 - 4. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.
 - 5. Joints:
 - a. Offset edge of each layer a minimum of 6 inches so joints are not directly over the underlying layer.
 - b. Offset longitudinal joints in roadway pavements so longitudinal joints in wearing layer coincide with pavement centerlines and lane divider lines.
 - c. Form transverse joints by cutting back on the previous day's run to expose full vertical depth of layer.

6. Succeeding lifts: Apply tack coat to pavement surface between each lift.
 7. After placement of pavement, seal meet line by painting a minimum of 6 inches on each side of the joint with cut-back or emulsified asphalt. Cover immediately with sand.
- D. Compaction:
1. Comply with the requirements of the Standard Specifications.
 2. Joint compaction shall follow the requirements the Standard Specifications.
- E. Tolerances: Tolerances shall comply with the Standard Specifications.
- F. Seal coat:
1. General: Apply seal coat of paving grade or emulsified asphalt to finished surface at longitudinal and transverse joints, joints at abutting pavements, areas where asphalt concrete was placed by hand, patched surfaces, and other areas as directed by the Engineer.
 2. Preparation:
 - a. Surfaces that are to be sealed shall be maintained free of holes, dry, and clean of dust and loose material.
 - b. Seal in dry weather and when temperature is above 35 degrees F.
 3. Application:
 - a. Fill cracks over 1/16-inch in width with asphalt-sand slurry or approved crack sealer prior to sealing.
 - b. When sealing patched surfaces and joints with existing pavements, extend a minimum of 6 inches beyond edges of patches.

3.06 PAVEMENT OVERLAY

- A. Preparation:
1. Pavement overlay preparation shall comply with the Standard Specifications.
- B. Application:
1. Pavement overlay application shall comply with the Standard Specifications.

3.07 PATCHING

- A. Preparation:
1. Remove damaged, broken, or unsound asphalt concrete adjacent to patches.
 2. Trim straight lines exposing smooth, sound, vertical edges.
 3. Prepare patch subgrade as specified in the Standard Specifications.
- B. Application:
1. Patch thickness: 3 inches or thickness of adjacent asphalt concrete, whichever is greater.

2. Place asphalt concrete mix across full width of patch in layers of equal thickness.
 3. Spread and grade asphalt concrete with hand tools or mechanical spreader, depending on size of area to be patched.
- C. Compaction: Follow compaction requirements specified in the Standard Specifications.
- D. Tolerances: Comply with the Standard Specifications.

END OF SECTION

SECTION 32 91 19.13

TOPSOIL PLACEMENT AND GRADING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Topsoil Placement and Grading as shown on the Drawings, as specified, and/or directed.

1.02 SUBMITTALS

- A. The Contractor shall provide a pH test and organic content test for the Engineer's review for each source of topsoil to be used.

1.03 QUALITY ASSURANCE

- A. Topsoil will be visually inspected upon delivery and material that does not comply with the Specification will be rejected.

PART 2 - PRODUCTS

2.01 MATERIAL

- A. Topsoil
 1. Topsoil for such depth as directed shall be removed from areas of the site where excavations are to be made or embankments placed. The soil so removed shall be transported and stored in piles at convenient locations designated or approved and shall be kept separate from all other classes of excavated material. Should the Contractor fail to keep separate from other material any soil removed, he shall procure and furnish at his own expense an equivalent quantity of satisfactory topsoil.
 2. The Contractor is required to process the topsoil/compost. The material shall contain no admixture of refuse or any material toxic to plant growth and shall be free from subsoil, stones, clay lumps or similar objects larger than two inches in greatest dimension. Sod and herbaceous growth such as grass and weeds need not be removed. Topsoil shall not be delivered or placed in a frozen or muddy condition.
 3. Contractor to condition topsoil as necessary. Topsoil from on-site and off-site sources shall have an acidity range of pH 5.5 to 7.6 and shall contain 4 to 20% organic matter as determined by loss of ignition of moisture-free samples dried at 100 degrees C.
 - a. Where topsoil pH is below 5.5, lime shall be added at a rate of 2-1/2 lbs. per cubic yard of topsoil until the pH is above 5.5.

- b. Where topsoil pH is above 7.6, aluminum sulfate shall be added at a rate of 2-1/2 lbs. per cubic yard of topsoil until the pH drops below 7.6.
- B. Soil Amendments
 - 1. Lime: Natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.
 - 2. Aluminum Sulfate: Commercial grade, in dry powder form.

PART 3 - EXECUTION

3.01 PLACEMENT

- A. Topsoil shall include fine grading the surface of the ground upon which topsoil is to be placed and the furnishing and placing of topsoil in the areas to be seeded or planted.
- B. Depth of topsoil shall be minimum 4 inches unless otherwise shown or directed.
- C. After approval by the Engineer of the fine grading of the subgrade, the topsoil shall be spread and compacted with a light roller to the lines, grades and elevations shown on the drawings, or directed by the Engineer, without unsightly variations, ridges or other depressions which will hold water. Any stone, litter or objectionable material shall be removed from the topsoil and the surface raked to true lines. Any uneven spots shall be leveled. The work shall not be performed during unsuitable weather.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Seeding as shown on the Drawings, as specified, and/or directed.
- B. The Contractor shall seed new areas and disturbed areas where shown on the drawings, specified or directed by the Engineer. Contractor shall prepare the seed bed by scarifying or otherwise loosening topsoil to a depth of 2 inches, applying fertilizer, lime or aluminum sulfate, seed and mulch or rolled erosion control products at the rates specified.
- C. Topsoil shall be applied to the locations identified in the Contract Drawings and prepared as outlined in Section 32 91 19.13.

1.02 SUBMITTALS

- A. The Contractor shall submit to the Engineer for approval the method of seeding and the information outlined in Article 2.01.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Fertilizer:
 - 1. Commercial starter fertilizer (30-0-4) shall contain not less than thirty percent nitrogen, zero percent available phosphoric acid and four percent water soluble potash. The fertilizer shall be inorganic or a combination of inorganic and organic substances.
 - 2. If, as an alternative, the Contractor wishes to substitute another starter fertilizer, he may do so with the approval of the Engineer.
 - 3. Commercial fertilizer shall be delivered in original bags of the manufacturer, showing weight, analysis and the name of the manufacturer.
 - 4. If the commercial fertilizer is not used immediately after delivery, the Contractor shall store it in such a manner that its effectiveness will not be impaired.
- B. Seed:
 - 1. Grass seed shall be a mixture of the species and/or varieties specified, mixed in the proportions specified.

2. The seed shall be fresh, recleaned and of the latest crop year. It shall conform to Federal and State Standards. Each type of grass in the mixture shall meet or exceed the minimum percentage purity and germination listed for that type of grass.
3. The following seed mixture shall be used for ditches, slopes and all areas disturbed by construction.

<u>Percentage by Weight</u>	<u>Species or Variety</u>	<u>Percent Germination</u>
30	Kentucky 31 Tall Fescue	90%
30	Perennial Ryegrass	90%
20	New Zealand White Clover	90%
20	Creeping Red Fescue	90%

4. The balance of material in an acceptable seed mixture, other than specified pure live seed shall, for the most part consist of nonviable seed, chaff, hulls, live seeds of crop plants and harmless inert matter. The percentage of weed shall not exceed one percent by weight for the mixture.
5. All seed mixtures furnished under this Item shall be mixed by the vendor and shall be delivered in standard sized bags of the vendor, showing the weight, analysis and vendor's name.
6. All seed shall be properly stored by the Contractor at the site of the work and any seed damaged during storage shall be replaced.

C. Mulch:

1. Straw or hay mulch shall consist of oats, wheat, rye or other approved crops which are free of noxious weeds. Weight shall be calculated on the basis of the straw having not more than 15% of moisture content.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Time For Seeding

1. Grass seed shall be sown from March 15th to June 1st or from August 15th to October 1st, unless otherwise approved by the Engineer. All seeding shall be done in a dry or moderately dry soil and at times when the wind does not exceed a velocity of five miles per hour. The Contractor is required to water seeded areas as necessary to provide favorable growing conditions as necessary.

B. Preparation of Seed Bed

1. After the finished grading is completed and just before seeding, the areas to be seeded shall be loosened to a depth of two inches and free from depressions which will hold water. All sticks, stones, clods, roots or other

objectionable material which might interfere with the formation of a fine seed bed shall be removed from the soil.

2. Commercial fertilizer shall be evenly applied at the rate of 300 pounds per acre.

C. Seeding

1. Grass seed mixture shall be sown at the rate of 200 pounds per acre.
2. The seed shall be sown by hand or by an approved machine, in such a manner that a uniform stand will result.
3. After sowing, seeded areas shall be rolled with a light lawn roller weighing not more than one hundred pounds per foot of width.

D. Mulching

1. Within three days after the seed is sown, the seeded areas shall be covered with a uniform blanket of straw mulch at the rate of 1,000 pounds per acre of seeded area or as required to provide 90% coverage (i.e., lightly cover 90% of the surface).

E. Hydroseeding

1. The Contractor may substitute a hydroseeding process for hand seeding and mulching as specified above.
2. Where hydroseeding is used, the Contractor shall mix water, seed fertilizer, mulch and mulch anchorage at the following rates and apply to the prepared seed bed by means of a hand-held hose. No truck mounted spraying equipment shall be driven over the areas to be seeded. Discharge shall be in an uphill direction only unless otherwise approved by the Engineer.
 - a. Fertilizer - 300 lbs. per acre
 - b. Seed - 250 lbs. per acre
 - c. Mulch - Sufficient to equal 90% straw mulch coverage
 - d. Mulch Anchorage - Per Manufacturer's instructions
 - Chemical 750 lbs. wood fiber/acre
 - Wood Cellulose
3. Where the mulch anchorage is provided ready mixed with the mulch, no additional mulch anchorage will be required.
4. Mulch shall be a commercial cellulose hydromulch such as "Conwed 2000", "Turf Fiber", or equal. Soil seal or mulch anchorage used shall be approved by the Engineer. An asphalt emulsion shall not be used as mulch anchorage.

F. Maintenance and Protection

1. The Contractor shall maintain and protect all seeded areas until final acceptance of the Seeding portion of the Contract.
2. Final acceptance will not be made until an acceptable uniform stand of grass is obtained in all newly seeded areas except that the Engineer at his discretion may accept a portion or portions of the work at various times.

3. Upon final acceptance of a seeded area by the Engineer, the Owner will assume responsibility for maintenance and protection of that area.
4. Any portions of seeded areas which are unacceptable, and which fail to show a uniform stand of grass from any cause, shall be reseeded as before except the fertilizer shall be applied at one-half the original rate. The seeding shall be repeated until the seeded areas are satisfactorily covered with grass.

END OF SECTION