



The State University
of New York

Project Manual

For construction contracts greater than \$20,000

MULTI-PURPOSE SYNTHETIC TURF FACILITY SU-092923 (Electrical Work)

Dated November 30, 2023

Proposal Due Date
January 31, 2024

State University of New York Purchase College
735 Anderson Hill Road
Purchase, New York 10577-1402
Sheli Taylor, Associate Director

Project Number: SU-092923

Date: 11/30/23

Project Name: MULTI-PURPOSE SYNTHETIC TURF FACILITY (Electrical Work)

Agency/Div Code: SUNY Purchase College 28260

Contract No. D990228

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State University of New York Construction Agreement

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4. [Form 7554-07](#) – Contractor Proposal
5. [Form 7554-10](#) - Bid Bond and Acknowledgement (*required with bid*)
6. Affirmative Action and Minority & Women Owned Business Enterprises *from SUNY Procedure Item #7557 “Participation by Minority Group Members and Women (MWBES) with Respect to State*

University of New York Contract” (applies >\$100,000)

- a. [Form 7557-121b](#) – MWBE Prospective Bidders Notice
- b. [Form 7557-107](#) - M/WBE Utilization Plan (*required within seven days of the bid*)
- c. The Contractor’s EEO Policy Statement or [Form 7557-104](#) (*required within seven days of the bid*)
- d. [7557-108](#) - M/WBE-EEO Work Plan or EEO Staffing Plan (*required within seven days of the bid*)

Note: In accordance Procedure Item #7557 MWBE Utilization Plans, EEO policy statements and EEO Work Plans are due within seven days of submittal of the bid.

7. Service Disabled Owned Business Enterprise *from SUNY Procedure Item #7564 “Participation by Service-Disabled Veteran-Owned Business (SDVOBs) with Respect to State University of New York Contracts” (applies >\$100,000)*
 - a. [Form 7564-121b](#) – SDVOB Prospective Bidders Notice
 - b. [Form 7564-107](#) - SDVOB Utilization Plan (*required within seven days of the bid*)

Attachments –Additional Contractor Documentation (required after bid opening from the low bidder)

8. State Finance Law §§139-j and 139-k *from SUNY Procedure Item #7552 “Procurement Lobbying Procedure for State University of New York” (applies >\$15,000)*
 - a. [Form A](#) - Summary: Policy and Procedure of the State University of New York Relating to State Finance Law §§139-j and 139-k
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 - a. [Form 7554-20](#) Bidder’s Certifications
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 - a. [Form 7554-11](#) Labor & Materials and Performance Bonds (*applies >\$50,000*)
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12. Vendor Responsibility
 - a. OSC’s [VendRep - Online System](#) or [Link to paper forms](#) (*form applies ≥ \$100,000*)
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 - a. [Form 7554-13](#)
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Notice to Bidders and Newspaper Advertisement

The State University of New York at Purchase College will receive sealed bids for project number SU-092923 Multi-Purpose Synthetic Turf Facility (Electrical Work) until 3 p.m. local time on Wednesday, January 31, 2024, at the Procurement and Accounts Payable Office, Campus Center South, Purchase College, 735 Anderson Hill Road, Purchase New York 10577-1402 where such proposals will be publicly opened and read aloud. Proposals may be hand delivered or mailed to the above location and must be received by such time.

All work on this Contract is to be completed within 270 calendar days after the date of the Notice to Proceed.

A non-mandatory pre-bid conference and site walk-through for prospective Bidders will be held at 10 a.m. on Wednesday, December 13th, 2023, at Capital Facilities Office Conference Room, Purchase College, 735 Anderson Hill Road, Purchase New York 10577-1402. This will be the only guided walk-through of the subject project facilities.

For directions to Purchase College, see.

<https://www.purchase.edu/admissions/travel-and-transportation/#Directions>

For a campus map, see

<https://www.purchase.edu/live/files/220-campus-map>

Purchase College is dedicated to environmentally sustainable practices and development. To conserve resources and reduce waste, the Bidding and Contract Documents will only be available electronically in PDF format for viewing and downloading at the following website:

<https://www.purchase.edu/PurchaseMeansBusiness>

There will be a Question Period from December 6, 2023, through January 10, 2024, C.O.B. During this time, any questions must be submitted in writing (no telephone calls) to the following email address sayim.malik@purchase.edu. The email should reference the project in the subject line and include prospective bidder contact information. A response to all questions submitted within the Question Period and any required Addenda will be posted no later than the close of business on January 24, 2024.

Bids must be submitted in duplicate in accordance with the instructions contained in the Information for Bidders. Security will be required for each bid in an amount not less than five (5) percent of the Total Bid.

It is the policy of the State of New York and the State University of New York to encourage minority business enterprise participation in this project by contractors, subcontractors and suppliers, and all bidders are expected to cooperate in implementing this policy.

The Prevailing Rate Case (PRC) Number assigned to this project is PRC# 2023013528. The rates of wages and supplements determined by the Industrial Commissioner of the State of New York as prevailing in the locality of the site at which the work will be performed can be found at:

<https://apps.labor.ny.gov/wpp/publicViewProject.do?method=showIt&id=1559326>

Pursuant to State Finance Law §§139-j and 139-k, this solicitation includes and imposes certain restrictions on communications between Purchase College and an Offer or/Bidder during the procurement process. An Offer or/Bidder is restricted from making contacts from the earliest notice of intent to solicit proposals through final award and approval of the Procurement Contract by Purchase College/State University of New York and, if applicable, the Office of the State Comptroller ("restricted period") to other than designated staff unless it is a contact that is included among certain statutory exceptions set forth in State Finance Law §139-j(3)(a). Pursuant to the statute, Purchase College employees are also required to obtain certain information when contacted during the restricted period and maintain a record of the communication and

make a determination of a knowing and willful contact. Contact made to other than designated staff regarding this procurement may disqualify the vendor from the current award and affect future procurements with government entities in the State of New York.

The State University of New York reserves the right to reject any or all bids.

Designated Contacts:

Sayim Malik
Project Manager, Capital Facilities Planning
Purchase College
State University of New York
735 Anderson Hill Road
Purchase, NY 10577-1402
Tel: (914) 251-4479
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INFORMATION FOR BIDDERS

Section 1 Definitions

All definitions set forth in the Agreement are applicable to the Notice to Bidders, Information for Bidders and the Proposal, all of which documents are hereinafter referred to as the Bidding Documents.

Section 2 Issuance of Bidding and Contract Documents

Drawings and Specifications will be issued by the Consultant upon request after payment of the deposit specified in the Notice to Bidders.

Section 3 Proposals

- (1) Proposals must be submitted in duplicate on the forms provided by the University. They shall be addressed to the University in a sealed envelope, marked with the name and address of the bidder, the title of the Project and the Project number. The University accepts no responsibility for Proposals that may be delivered by any courier or other messenger service that does not contain all of the above-noted information on the outside of a sealed envelope. Facsimile or email copies of the Proposal will not be accepted.

Sealed Proposals are to be delivered to:

Sheli Taylor, Associate Director
SUNY, Purchase College
735 Anderson Hill Road
Purchase, NY 10577-1402
Tel: (914) 251-6089
Email: sheli.taylor@purchase.edu

- (2) All blank spaces in the Proposal must be filled in and, except as otherwise expressly provided in the Bidding Documents; no change is to be made in the phraseology of the Proposal or in the items mentioned therein.
- (3) Proposals that are illegible or that contains omissions, alterations, additions or items not called for in the Bidding Documents may be rejected as informal. In the event any bidder modifies, limits or restricts all or any part of its Proposal in a manner other than that expressly provided for in the Bidding Documents, its Proposal may be rejected as informal.
- (4) Any Proposal may be considered informal which does not contain prices in words and figures in all of the spaces provided or which is not accompanied by a bid security in proper form. In case any price shown in words and its equivalent shown in figures do not agree, the written words shall be binding upon the bidder. In case of a discrepancy in the prices contained in the Proposal forms submitted in duplicate by the bidder, the Proposal form which contains the lower bid shall be deemed the bid of the bidder; provided, however, the University at its election may consider the Proposal of such bidder informal.
- (5) If the Proposal is made by a corporation, the names and places of residence of the president, secretary and treasurer shall be given. If by a partnership, the names and places of residence of the partners shall be given. If by a joint venture, the names and addresses of the members of the joint venture shall be given. If by an individual, the name and place of residence shall be given.

- (6) No Proposal will be considered which has not been deposited with the University at the location designated in and prior to the time of opening of bids designated in the Bidding and Contract Documents or prior to the time of opening as extended by Addendum.
- (7) Bids may be modified, withdrawn or canceled only in writing or by email notice received by the University prior to the time of opening of bids designated in the Bidding and Contract Documents. A written or email notice of modification, withdrawal or cancellation shall be marked by the bidder with the name and address of the bidder, the title of the Project and the Project number. Upon receipt by the University a duly authorized employee of the University, who shall note thereon the date and time of receipt and shall thereupon attach said written or email notice of modification, withdrawal or cancellation to the envelope submitted by the bidder pursuant to subdivision (1) of this section.
- (8) Permission will not be given to modify, explain, withdraw or cancel any Proposal or part thereof after the time designated in the Bidding and Contract Documents for the opening of bids, unless such modification, explanation, withdrawal or cancellation is permitted by law and the University is of the opinion that it is in the public interest to permit the same.

Section 4 Examination of Bidding and Contract Documents

- (1) Prospective bidders shall examine the Bidding and Contract Documents carefully and, before bidding, shall make written request to the Consultant (with a copy thereof to the University) for an interpretation or correction of any ambiguity, inconsistency or error therein which should be discovered by a reasonably prudent bidder. Such interpretation or correction as well as any additional Contract provision the University shall decide to include will be issued in writing by the Consultant as an Addendum, which will be sent to each person recorded as having received a copy of the Bidding and Contract Documents from the Consultant, and which also will be available at the places where the Bidding and Contract Documents are available for inspection by prospective bidders. Upon such emailing or delivery and making available for inspection, such Addendum will become a part of the Bidding and Contract Documents and will be binding on all bidders whether or not the bidder receives or acknowledges the actual notice of it. Prospective bidders are responsible for ensuring that all addenda have been incorporated into the bid. The requirements contained in all Bidding and Contract Documents shall apply to all Addenda.
- (2) Only the written interpretation or correction so given by Addendum shall be binding. Prospective bidders are warned that no trustee, officer, agent or employee of the University or the Consultant is authorized to explain or interpret the Bidding and Contract Documents by any other method, and any such explanation or interpretation, if given, must not be relied upon.

Section 5 Computation of Bid

- (1) In computing their bids, bidders are not to include the sales and compensating use taxes of the State of New York or of any city and county in the State of New York for any supplies or materials which are incorporated into the completed Project as the University is exempt from such taxes.
- (2) Unit prices may be inserted in the Proposal by the University or the bidder at the discretion of the University. Any unit prices listed in the Proposal by the University are based upon the Consultant's appraisal of a fair cost for the work involved. Such listed prices will be binding upon both the bidder and the University unless the bidder wishes to change any of such unit prices by crossing out the listed unit price and inserting a revised unit price. Such revised unit price shall not be binding upon

the University unless it accepts the same, in writing, before it issues a Notice of Award. In the event the Proposal contains blank spaces for unit prices or the bidder revises any stated unit price, the amount of such unit prices for additions shall not vary by more than 15 percent from the prices inserted by the bidder for deductions, and, if the variance of such prices exceeds 15 percent, the University may adjust the deduction price inserted by the bidder so that it is only 15 percent lower than the addition price inserted by the bidder. In addition, the University may adjust any unit price filled in by a bidder to an amount agreeable to both the bidder and the University or it may reject any unit prices.

- (3) Alternates, if any, listed in the Proposal shall be accepted in the order indicated and will be used in combination with the Base Bid to determine the low bidder. Unit prices will not be used to determine the low bidder.
- (4) If a tie bid should occur the University reserves the right to use one of the following methods to determine the successful bidder. For tie bids between two contractors the University representative shall flip a coin, both affected contractors must be present for the coin toss. For tie bids between three or more contractors the University representative shall pull names from a bowl, hat or other container. The affected contractors must be present for the drawing.

Section 6 Payment of Bid Security

- (1) Each Proposal must be accompanied by the required amount of the bid security, which is 5% of the Total Bid, in the form of a bank draft or certified check, payable at sight to the University and drawn on a bank authorized to do business in the United States, or by a Bid Bond, on a form approved by the University, duly executed by the bidder as principal and having as surety thereon a surety company or companies, approved by the University, authorized to do business in the State of New York as a surety. Attorneys-in-fact who execute a Bid Bond on behalf of a surety must affix thereto a certified and effectively dated copy of their power of attorney.
- (2) The University will return, without interest, bid securities in accordance with the following procedure:
 - a. To all bidders except the apparent three (3) lowest bidders within two (2) working days after the opening of bids.
 - b. To any bidder submitting a Bid Bond as a replacement for a previously provided bank draft or certified check, within two (2) working days after the University's approval of such Bid Bond.
 - c. To the apparent three (3) lowest bidders, unless their bid security was previously returned, within two (2) working days after delivery to the University by the successful bidder of the executed Agreement and required Bonds, or within two (2) working days of the University's rejection of all bids or within two (2) working days after the expiration of forty-five (45) calendar days after the bid opening, whichever event shall occur first.
 - d. Bid Bonds, due to their nature, will not be returned.
- (3) The University reserves the right to deposit bid security drafts or checks pending final disposal of them.

Section 7 Qualifications of Bidders

- (1) A bidder must demonstrate, to the satisfaction of the University, that it has successfully completed three (3) contracts similar in size, scope and complexity to this contract within the last five (5) years.
 - a. For scope and complexity, similar work is defined as furnishing and installing a complete LED Sports Lighting System, with all associated work.
 - b. For size, the bidder should provide evidence that they have performed similar work at dollar amounts approximately equal (or greater) to the amount of bidder's bid.
 - c. The determination of relevant contract experience in terms of size, scope and complexity will be at the sole discretion of the University.
 - c. The above three projects shall be submitted on Attachment A of the Proposal (Form 7554-07), "List of Completed Similar Construction Projects" (the List). If the List is not provided or is missing information, and/or is found to have erroneous information or information that is no longer current, a Proposal may be rejected as not responsive. If requested by the University, the bidder may be permitted to add missing information, modify and/or explain erroneous information or information that is no longer current on the List. Modifications and/or explanations of the List must be received within 48 hours of receipt of the University's request.
- (2) All prospective bidders must demonstrate to the satisfaction of the University that they have the skill and experience, as well as the necessary facilities, ample financial resources, ability to manage staff and subcontractors effectively, ability to anticipate and plan construction work for optimal progress, ability to create, strive for and maintain working environments and relationships that are constructive, communicative and cooperative, organization and general reliability to do the work to be performed under the provisions of the Contract in a satisfactory manner and within the time specified.
- (3) Each bidder must demonstrate to the satisfaction of the University that it has working capital available for the Project upon which it is bidding in an amount equal to 15 percent of the first \$100,000 of the amount of its Base Bid plus 10 percent of the next \$900,000 plus 5 percent of the remainder of its Base Bid. Working capital is defined as the excess of current assets over current liabilities. The University defines current assets as assets which can be reasonably expected to be converted into cash within a year, and current liabilities as debts which will have to be paid within a year.
- (4). The University may make such investigation as the University deems necessary to determine the ability of any bidder to perform the Work. Bidders shall furnish to the University all information and data required by the University, including complete financial data, within the time and in the form and manner required by the University. The University reserves the right to reject any bid if the evidence submitted by or an investigation of such bidder fails to satisfy the University that such bidder is properly qualified to carry out its obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.
- (5) At the time of the bid opening, all bidders and subcontractors, domestic and foreign, must be in compliance with New York State business registration requirements. Contact the NYS Department of State regarding compliance.

Section 8 Submission of Post-Bid Information

- (1) Within forty-eight (48) hours after the opening of bids, each of the apparent three lowest bidders, unless otherwise directed by the University or otherwise provided in the Bidding and Contract Documents, shall submit to both the University and the Consultant:
- a. Evidence of a completed New York State Uniform Contracting Questionnaire (Vendor Responsibility Questionnaire For-Profit Construction (CCA-2)). Either email confirmation that the bidder's CCA-2 is current and certified in the New York State VendRep System (VendRep) within the last six months from the bid date, or deliver a certified paper format CCA-2, including all attachments, to the University.

The University recommends that vendors file the required CCA-2 online via the VendRep. To enroll in and use the VendRep, see the VendRep Instructions at https://www.osc.state.ny.us/vendrep/info_vrsystem.htm or go directly to the VendRep online at <https://portal.osc.state.ny.us>. To request assistance, contact the Office of the State Comptroller's ("OSC") Help Desk at 866-370-4672 or 518- 408-4672 or by email at ciohelpdesk@osc.state.ny.us.

The paper format CCA-2 and accompanying definitions are available on the OSC website at the following location:

http://www.osc.state.ny.us/vendrep/forms_vendor.htm

- b. A working plan and schedule showing clearly, in sequence and time-scale, all significant activities of the work. The working plan and schedule shall be in the form of suitable charts, diagrams or bar graphs and shall be based on the Contractor's logic and time estimates for the anticipated time of commencement and completion of the work and its significant phases and activities and the interrelationship between such significant activities and other items pertinent to the work. This requirement is in addition to and not a substitute for the schedule requirements of section 3.02 (Time Progress Schedule) of the Agreement. Although the working plan and schedule submitted shall not be used in determining the lowest responsible bidder, failure to submit the working plan and schedule may result in the rejection of the Proposal as not responsive.
- c. The names and addresses of the bidder's proposed subcontractor for the Asbestos Abatement work of any value, and proposed subcontractors for Electrical Work, the Heating, Ventilating and Air-Conditioning Work and the Plumbing Work for each of said work categories valued at \$100,000 or more.
 - i. For each proposed subcontractor named, provide a completed "List of Completed Similar Construction Projects (the List)." If the List is not provided or is missing information, and/or is found to have erroneous information or information that is no longer current, a proposed subcontractor may be rejected. If requested by the University, the bidder may be permitted to add missing information, modify and/or explain erroneous information or information that is no longer current on the List; modifications and/or explanations of the List must be received promptly after receipt of the University's request.
 - ii. Only one proposed subcontractor should be named for each of such trades. Proposed subcontractors of the bidder may not be changed except with the specific written

approval of the University.

- iii. The naming of the bidder itself for any of such work is not acceptable and may result in rejection of the bidder unless the bidder can demonstrate to the University that it has successfully completed or substantially completed three (3) contracts similar in size, scope and complexity for the designated work within the last five (5) years. The determination of relevant contract experience in terms of size, scope and complexity will be at the sole discretion of the University.
 - iv. The bidder will be required to establish, to the satisfaction of the Consultant and the University, the reliability and responsibility of each of their said proposed subcontractors to furnish and perform the work described in the sections of the Specifications pertaining to each of such proposed subcontractors' respective trades. By submission of the "List of Completed Similar Construction Projects," a proposed subcontractor must be able to demonstrate that they have successfully completed or substantially completed three (3) contracts similar in size, scope and complexity for the designated work within the last five (5) years. The determination of relevant contract experience in terms of size, scope and complexity will be at the sole discretion of the University.
 - v. For each of the proposed subcontractors, the bidders must submit to the University, within seven (7) calendar days after the bid opening, evidence of a completed New York State Uniform Contracting Questionnaire (Vendor Responsibility Questionnaire For-Profit Construction (CCA-2)). Either email confirmation that the subcontractor's CCA-2 is current and certified in the New York State VendRep System (VendRep) within the last six months from the bid date, or deliver a certified paper format CCA-2, including all attachments, to the University.
 - vi. In the event that the University and the Consultant reject any of said proposed subcontractors, the bidder, within two (2) working days after receipt of notification of such rejection, shall again submit to the University and the Consultant the name of another proposed subcontractor in place of the one rejected and it will be required to establish to the satisfaction of the University and the Consultant the reliability and responsibility of said proposed subcontractor; When naming another proposed subcontractor, the bidder must promptly submit the proposed subcontractor's completed "List of Completed Similar Construction Projects" and their completed CCA-2.
 - vii. The bidder will not be permitted to submit another proposed subcontractor if it designated itself for any of the aforesaid categories of work.
 - viii. Proposed subcontractors of the bidder, approved by the University and the Consultant, must be used on the work for which they were proposed and approved and they may not be changed except with the specific written approval of the University.
- d. A breakdown of the amount of the bidder's Proposal. Such breakdown shall be prepared in accordance with industry standards. No bidder shall be barred from revising, in the Contract breakdown required under the provisions of Section 4.08 of the Agreement, the various amounts listed in the bid breakdown required under the provisions of this Section. The amount set forth in said bid breakdown will not be considered as fixing the basis for additions to or deductions from the Contract consideration.

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- (2) Except for Contracts of \$100,000 or less, within seven (7) calendar days after the opening of bids, unless otherwise directed by the University, the three low bidders shall submit to the University for its approval, a Minority and Women-owned Business Enterprise Utilization Plan ([Form 7557-107](#)).
- (3) Except for contracts of \$100,000 or less, within seven (7) calendar days after the opening of bids, the three low bidders shall submit to the University for its approval, an Equal Employment Opportunity Statement and EEO Staffing Plan ([Form 7557-108](#)) to ensure equal employment opportunities without discrimination because of race, creed, color, sex or national origin. Such Statement and plan should demonstrate the bidder's intent to comply with the provisions of Article VI of the Agreement. The EEO plan should include the methods that the bidder will use to address nondiscrimination and affirmative action so that minorities and women will be included in the work force. The Equal Employment Opportunity ("EEO") Policy Statement that shall contain, but not necessarily be limited to, a provision that the bidder, as a precondition to entering into a valid and binding Contract with the University, shall during the performance of the Contract, agree to the following:
- a. It will not discriminate against any employee or applicant for employment because of race, creed, color, national origin, sex, age, disability or marital status, will undertake or continue existing programs of affirmative action to ensure that minority group membership and women are afforded equal employment opportunities without discrimination, and shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on the Contract.
 - b. It shall state in all solicitations or advertisements for employees that, in the performance of the Contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.
 - c. At the request of the University, it shall request each employment agency, labor union or authorized representative of workers, with which it has collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the bidder's obligations herein.
 - d. After the award of the contract, it shall submit to the University a work force utilization report, in a form and manner required by the University, of the work force actually utilized on the Contract, broken down by specified ethnic background, gender and Federal occupational categories or other appropriate categories specified by the University.
- (4) The above information and such other information as the University or the Consultant may request or obtain will be used by the University in determining the reliability and responsibility of the bidder and any proposed subcontractors. Each bidder must comply promptly with all requests by the University and the Consultant for information and must actively cooperate with the University and the Consultant in their efforts to determine the qualifications of the bidder and any proposed subcontractors. Failure to comply with the latter may result in the rejection of the Proposal as not responsive. All information required to be furnished to the University under this Section shall be sent to the State University at {insert address or email address}.

Section 9 Award of Contract

- (1) The award of the Contract shall be made to the bidder submitting the lowest bid that is responsive to the solicitation and who, in the sole opinion of the University, is qualified to perform the work. The University shall determine the lowest bid by adding to or deducting from the Base Bid of the bidders the additive or deductive alternates, if any, the University elects to accept after the opening of the Proposals. Alternates will be accepted in the order they are set forth in the Proposal. The unit prices set forth in the Proposal for additions to or deductions from the work shall not be considered in determining the lowest bid.

The lowest base bid shall not exceed the amount of funds then estimated by the University as available to finance the contract. If the lowest bidder exceeds such amount, the University may reject all bids, or may award the contract on the base bid combined with deductive alternates applied in the order they are set forth in the Proposal as produces the net amount which is within the available funds.

- (2) The right is reserved, if, in the University's judgment, the public interest will be promoted thereby, to reject any or all Proposals, to waive any informality in any Proposal received or to afford any bidder an opportunity to remedy any deficiency resulting from a minor informality or irregularity. Without limiting the generality of the foregoing:
- a. A Proposal may be rejected as not responsive if the bidder fails to furnish the required bid security or to submit the data required with or after its Proposal and this Information for Bidders.
 - b. A Proposal may be rejected as not responsive if the bidder cannot show to the satisfaction of the University: (i) that it has the necessary qualifications and capital; or (ii) that it owns, controls or can procure the necessary plant and equipment to commence the work at the time prescribed in the Contract and thereafter to prosecute and complete the work at the rate, or within the time specified; or (iii) that it is not already obligated by the performance of so much other work as is likely to delay the commencement, prosecution or completion of the work contemplated by the Contract.
 - c. A Proposal will be rejected as not responsive if it does not provide for the completion of the work by the date of completion specified in the Proposal.
- (3) The University also expressly reserves the right to reject any Proposal as not responsive if, in its opinion, considering the work to be performed, the facts, as to the bidder's business or technical organization, plant, financial and other sources of business experience compared with the work bid upon, justify rejection.
- (4) The award of the Contract shall not be construed as a guarantee by the University that the plant, equipment and the general scheme of operations and other data submitted by the bidder with or after its Proposal is either adequate or suitable for the satisfactory performance of the work.

Section 10 Required Bonds and Insurance

- (1) Unless otherwise agreed to by the University, within ten (10) working days after the receipt of Letter of Intent, the Contractor shall procure, execute and deliver to the University and maintain, at its own cost and expense:

- a. A Performance Bond and a Labor and Material Bond, both of which bonds shall be on the form prescribed by the University and in an amount not less than 100 percent of the total amount of the Contract awarded to the Contractor by the University said bonds must be issued by a surety company approved by the University and authorized to do business in the State of New York as a surety.
 - b. Attorneys-in-fact who execute said Bonds on behalf of a surety must affix thereto a certified and effectively dated copy of their power of appointment.
- (2) Prior to the commencement of work the Successful Bidder will provide, at its sole cost and expense, Certificates of Insurance in accordance with Section 5.06 and 5.07 of the Construction Agreement, which shall remain in force throughout the term of the agreement, or any extension thereof. Such Certificates of Insurances shall be from an insurance company licensed by the New York State Department of Insurance with a rating of at least "A-" as published with Standard & Poor's, and a liability insurance policy with limits no less than **\$2,000,000** per claim. If during the term of the policy, the carrier's rating falls below "A-", the liability insurance must be replaced no later than the renewal date of the policy with an insurer acceptable to the State of New York. Such policies shall name the STATE UNIVERSITY OF NEW YORK as an additional insured. The policy shall designate the State University of New York as the loss payee and shall contain a provision that the State University of New York shall receive at least thirty (30) days' notice prior to material change, cancellation or expiration of any such policy.
- (3) **Workers Compensation Insurance & Disability Benefits Coverage**
All employees of the Successful Bidder shall be adequately and properly covered by Workers' Compensation Insurance and Disability Benefits coverage for all work related to the resultant contract. Such policies shall name the STATE UNIVERSITY OF NEW YORK as an additional insured and are to be written by recognized and well-rated insurance companies authorized to transact business in the State of New York. The Successful Bidder shall deliver certificates of such coverage, or proof that such coverage is not required, in the required format, as required by the Workers' Compensation Board, to the following when the agreement is signed by the parties and thereafter not less than thirty (30) days prior to material change or cancellation of such coverage.
- (4) Proof of insurances with the specific coverage and limits required in Article V of the Agreement. Acceptable documents are:
 - a. Proof of NYS Worker's Compensation is only accepted on the C-105.2 or U-26.3 form.
 - b. Proof of Disability insurance is only accepted on the DB-120.1 form. Use the link below for a description of the required forms for Workers Compensation and Disability:
<http://www.osc.state.ny.us/agencies/guide/MyWebHelp/Content/XI/18/G.htm>
 - c. All other proof of insurance must be on the Acord 25 Certificate of Liability Insurance form.
- (5) A 120-day schedule
 - a. After receipt of the Letter of Intent but before receipt of the Contract is Awarded, the Contractor, unless otherwise directed by the University, shall update the working plan and schedule previously submitted in accordance with the Information for Bidders to define the contractor's planned operations during the first 120 days and submit it to the University and the Consultant for their acceptance. The updated working plan and schedule shall be in the form of suitable charts, diagrams or bar graphs and shall be based on the Contractor's logic and time estimates. When updated, such plan and

schedule shall be sufficiently detailed to show clearly, in sequence, all salient features of the work of each trade including: the anticipated time of commencement and completion of such work and the interrelationship between such work, submission of Shop Drawings and Samples for approval, approval of Shop Drawings and Samples, placing of orders of materials, fabrication and delivery of materials, installation and testing of materials, contiguous or related work under other contracts, and other items pertinent to the work. The Notice to Proceed may be withheld until this schedule is received and is deemed responsive to the project requirements.

- b. After Contract Award, but before processing second progress payment application, the Contractor, unless otherwise directed by the University, shall submit to the University and the Consultant for their acceptance its proposed working plan and project time schedule for all the work covered by the Contract, and shall include activities for preparation and submission of all Shop Drawings and Samples. Said proposed working plan and schedule shall be prepared in accordance with the form and requirements set forth in the preceding paragraph.

Section 11 Minority and Women-Owned Business Enterprises

- (1) Pursuant to New York State Executive Law Article 15-A, the University recognizes its obligation under the law to promote opportunities for maximum feasible participation of certified Minority and Women-Owned Business Enterprises and the employment of minority group members and women in the performance of University contracts.
- (2) For purposes of this solicitation, the University hereby establishes an overall goal of 15.16% for MWBE participation, 9.69% for Minority-Owned Business Enterprises (“MBE”) participation and 5.47% for Women-Owned Business Enterprises (“WBE”) participation (based on the current availability of qualified MBEs and WBEs). For additional information please refer to the MWBE requirements outlined in the Prospective Bidders Notice ([Form 7557-121b](#)) and Exhibit A-1.
- (3) For guidance on how the University will determine a Contractor’s “good faith efforts,” refer to 5 NYCRR §142.8.
- (4) Please note the forms identified in the Prospective Bidders Notice ([Form 7557-121b](#)) must be submitted within seven days of the bid opening. Required forms include the MWBE-EEO Policy Statement ([Form 7557-104](#) or equivalent), the MWBE Utilization Plan ([Form 7557-107](#)) and the EEO Staffing Plan ([Form 7557-108](#)).
- (5) Upon contract award and prior to contract execution the selected awardee will enter its Statewide Utilization Management Plan (SUMP) and document its good faith efforts to achieve the applicable MWBE participation goals by submitting evidence through the New York State Contract System, which can be viewed at: <http://ny.newnycontracts.com>, provided however, that the selected awardee may arrange to provide such evidence via a non-electronic method by contacting the SUNY Office of Diversity, Equity, and Inclusion.
- (6) Any modifications or changes to the MWBE Utilization Plan after the Contract award and during the term of the Contract must be reported on a revised MWBE Utilization Plan and submitted to the University. The University will review the submitted MWBE Utilization Plan and advise the Bidder of the University’s acceptance or issue a notice of deficiency within 30 days of receipt.
- (7) If a notice of deficiency is issued, Awardee agrees that it shall respond to the notice of deficiency

within seven (7) business days of receipt by submitting to SUNY [address phone and fax information], a written remedy in response to the notice of deficiency. If the written remedy that is submitted is not timely or is found by SUNY to be inadequate, SUNY shall notify the Awardee and direct the Awardee to submit, within five (5) business days, a request for a partial or total waiver of MWBE participation goals on [Form 7557-114](#). Failure to file the waiver form in a timely manner may be grounds for disqualification of the bid or proposal.

SUNY may disqualify a Bidder as being non-responsive under the following circumstances:

- i. If a Bidder fails to submit a MWBE Utilization Plan;
- ii. If a Bidder fails to submit a written remedy to a notice of deficiency;
- iii. If a Bidder fails to submit a request for waiver; or
- iv. If SUNY determines that the Bidder has failed to document good faith efforts.

Section 12 Equal Employment Opportunity Requirements

- (1) Pursuant to Article 15 of the Executive Law (the "Human Rights Law"), and all other State and Federal statutory and constitutional non-discrimination provisions, the Bidder will not discriminate against any employee or applicant for employment because of race, creed, color, sex, religion, national origin, military status, sexual orientation, gender identity or expression, age, disability, predisposing genetic characteristics, domestic violence victim status, familial status or marital status. The Bidder shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest. The Bidder will state in all solicitations or advertisements for employees that, in the performance of this Contract, all qualified applicants will be afforded equal employment opportunities without discrimination.
- (2) The Bidder will undertake, or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination, and, if awarded a Contract pursuant to this solicitation, will make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force during its legal engagement with SUNY.
- (3) By submission of a bid or proposal in response to this solicitation, the Bidder agrees with all of the terms and conditions of SUNY Exhibit A including Clause 12 - Equal Employment Opportunities for Minorities and Women and acknowledges that, if the Bidder is awarded a Contract, The Contractor is required to ensure that it and any subcontractors awarded a subcontract over \$25,000 for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon (the "Work") except where the Work is for the beneficial use of the Contractor, shall undertake or continue programs to ensure that minority group members and women are afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status. For these purposes, equal opportunity shall apply in the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, termination, and rates of pay or other forms of compensation. This requirement does not apply to: (i) work, goods, or services unrelated to the Contract; or (ii) employment outside New York State.
- (4) The Bidder further agrees, where applicable, to submit with the bid a staffing plan ([Form 7557-108](#)) identifying the anticipated work force to be utilized on the Contract and, if awarded a Contract, will, upon request, submit to SUNY a workforce utilization report identifying the workforce actually utilized on the Contract if known. Forms are available in SUNY Procurement Policies and Procedures Document 7557 online at: http://www.suny.edu/sunypp/documents.cfm?doc_id=611.

Please Note: Failure to comply with the foregoing requirements may result in a finding of non-responsiveness, non-responsibility and/or a breach of the Contract, leading to the withholding of funds, suspension or termination of the Contract or such other actions or enforcement proceedings as allowed by the Contract.

Section 13 Executive Order 162 (EO162)

- (1) Governor Cuomo's Executive Order 162 requires state contractors to disclose data on the gender, race, ethnicity, job title, and salary of employees performing work on state contracts.
- (2) Bidder agrees to submit Workforce Utilization Report ([Form 7557-110](#)) and to require the same information to be submitted by any of their subcontractors on the state contract, in such format as shall be required by SUNY on a monthly basis for all construction contracts and quarterly basis for all other contracts during the term of the contract. Empire State Development has provided specific details on this requirement at <https://esd.ny.gov/doing-business-ny/mwbe/mwbe-executive-order-162>.

Section 14 Executive Order 177 (EO177)

- (1) The New York State Human Rights Law, Article 15 of the Executive Law, prohibits discrimination and harassment based on age, race, creed, color, national origin, sex, sexual orientation, gender identity, disability, marital status, military status, or other protected status.
- (2) The Human Rights Law may also require reasonable accommodation for persons with disabilities and pregnancy-related conditions. A reasonable accommodation is an adjustment to a job or work environment that enables a person with a disability to perform the essential functions of a job in a reasonable manner. The Human Rights Law may also require reasonable accommodation in employment on the basis of Sabbath observance or religious practices.
- (3) Generally, the Human Rights Law applies to: (i) all employers of four or more people, employment agencies, labor organizations and apprenticeship training programs in all instances of discrimination or harassment; (ii) employers with fewer than four employees in all cases involving sexual harassment; and (iii) any employer of domestic workers in cases involving sexual harassment or harassment based on gender, race, religion or national origin.
- (4) In accordance with Executive Order No. 177, prior to contract award, selected Awardee must submit a certification that it does not have institutional policies or practices that fail to address harassment and discrimination as described above. SUNY is electing to obtain the certification with the bid documents to avoid unnecessary delay in the contract award process. All Bidders must sign and submit the certification attached to this IFB, SUNY [Form 7554-20](#).

Section 15 Service-Disabled Veteran Owned Business Enterprises

- (1) Consistent with the State University of New York's commitment to, and in accordance with, Article 17-B of the New York State Executive Law, contractors are required to ensure that good faith efforts are made to include meaningful participation by Service-Disabled Veteran-Owned Business in SUNY's MWBE Program. The requirements apply to contracts in excess of \$100,000.
- (2) To ensure that SDVOB Enterprises are afforded the opportunity for meaningful participation in the performance of the University's contracts, and to assist in achieving the SDVOB Act's statewide

goal for participation on state contracts the University hereby establishes an overall goal of 6% for SDVOB participation for this solicitation.

- (3) For additional information please refer to the SDVOB requirements outlined in the Prospective Bidders Notice ([Form 7564-121b](#)). Please note the SDVOB Utilization Plan ([Form 7564-107](#)) must be submitted within seven days of the bid opening.

Section 16 Encouraging Use of New York State Business Businesses in Contract Performance

- (1) New York State businesses have a substantial presence in State contracts and strongly contribute to the economies of the state and the nation. In recognition of their economic activity and leadership in doing business in New York State, bidders/proposers for this contract for commodities, services or technology are strongly encouraged and expected to consider New York State businesses in the fulfillment of the requirements of the contract. Such partnering may be as subcontractors, suppliers, protégés or other supporting roles.
- (2) Bidders/proposers need to be aware that all authorized users of this contract will be strongly encouraged, to the maximum extent practical and consistent with legal requirements, to use responsible and responsive New York State businesses in purchasing commodities that are of equal quality and functionality and in utilizing services and technology. Furthermore, bidders/proposers are reminded that they must continue to utilize small, minority and women-owned businesses, consistent with current State law.
- (3) Utilizing New York State businesses in State contracts will help create more private sector jobs, rebuild New York's infrastructure, and maximize economic activity to the mutual benefit of the contractor and its New York State business partners. New York State businesses will promote the contractor's optimal performance under the contract, thereby fully benefiting the public sector programs that are supported by associated procurements.
- (4) Public procurements can drive and improve the State's economic engine through promotion of the use of New York businesses by its contractors. The State therefore expects bidders/proposers to provide maximum assistance to New York businesses in their use of the contract. The potential participation by all kinds of New York businesses will deliver great value to the State and its taxpayers.
- (5) Information on the availability of New York State subcontractors and suppliers is available from: New York State Department of Economic Development, Procurement Assistance Unit, One Commerce Plaza, Albany, New York 12245, Phone: (518) 474-7756, Fax: (518) 486-7577.

Section 17 Single Contract Responsibility

This is a single bid general construction project. The Contractor submitting the bid is responsible for all work associated with this Project.

Section 18 Examination of Site and Conditions of Work

- (1) A non-mandatory pre-bid conference and project walk-through will be held on **December 13, 2023, at 10 a.m.** with all contractors assembled at Capital Facilities planning Building conference room at Purchase College, 735 Anderson Hill Road, Purchase, NY 10577-1402. No individual or additional walk-throughs will be provided. Failure to attend a walk-through shall not be the cause for extra payment.

- (2) Each bidder must inform itself fully of the conditions relating to the construction of the project and the employment of labor on the project. Failure to do so will not relieve a successful bidder of their obligation to furnish all material and labor necessary to carry out the provisions of their contract. To the extent possible, the contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

Section 19 General Terms and Conditions

- (1) The following items will be incorporated into, and made part of, the formal agreement: (1) the University's Invitation for Bid; (2) the Successful Bidder's proposal; (3) Exhibit A, Standard Contract Clauses; (4) Exhibit A-1, Affirmative Action Clauses; and, (5) Forms A and B Procurement Lobbying Forms.
- (2) In the event of any inconsistency in or conflict among the document elements of the agreement described above, such inconsistency or conflict shall be resolved by giving precedence to the document elements in the following order: (1) Exhibits A and A-1; (2) Forms A and B Procurement Lobbying Forms, (3) the Agreement; (4) this IFB; and (5) the Successful Bidder's proposal.

Section 19.1 Vendor Debriefing and Contract Award Protest Procedure

- (1) Upon being notified of their unsuccessful bids, unsuccessful bidders may request in writing a debriefing within 15 calendar days of such notice. The 15 day period starts once unsuccessful bidders are notified. Once a request is made by the bidder, the University must schedule a debriefing within a reasonable time of such request. Unless the campus and bidder mutually agree to use another method such as by telephone, video conference or another type of electronic communication the debriefing must be conducted in person with the bidder.
- (2) This procurement is subject to SUNY Procedure Item 7561, Contract Award Protest Procedure.

Section 19.2 Proposal Confidentiality

- (1) All proposals and qualifications submitted for the University's consideration will be held in confidence. However, the resulting contract is subject to the New York State Freedom of Information Law (FOIL). Therefore, if a Bidder believes that any information in its proposal constitutes a trade secret or should otherwise be treated as confidential and wishes such information not to be disclosed the Bidder shall submit with its proposal a separate letter to the designated contact. The letter shall specifically identify the page number(s), line(s) or other appropriate designation(s) containing such information, explaining in detail why such information is a trade secret and formally requesting that such information be kept confidential. Failure by an Bidder to submit such a letter will constitute a waiver by the Bidder of any rights it may have under Section 89(5) of the Public Officers' Law relating to protection of trade secrets.
- (2) The proprietary nature of the information designated confidential by the Bidder may be subject to disclosure if ordered by a court of competent jurisdiction. A request that an entire proposal be kept confidential is not advisable since a proposal cannot reasonably consist of all data subject to FOIL proprietary status.

Section 19.3 Information Security Breach and Notification Act

- (1) The Bidder shall comply with the provisions of the New York State Information Security Breach and Notification Act (General Business Law Section 899-aa and State Technology Law, Section 208). The Bidder shall be liable for the costs associated with such breach if caused by its negligent or willful acts or omissions, or the negligent or willful acts or omissions of its agents, officers, employees or subcontractors.

Section 19.4 State Finance Law §§ 139-j and 139-k

- (1) State Finance Law §§139-j and 139-k imposes certain restrictions on communications between the University and a Bidder during the procurement process. During the restricted period the Bidder is restricted from making contacts to other than designated contact unless it is a contact that is included among certain statutory exceptions set forth in State Finance Law §139-j(3)(a). The restricted period is from the earliest notice of intent to solicit offers through final award and approval of the Contract.
- (2) University employees and their designated representatives are also required to obtain certain information when contacted during the restricted period and make a determination of the responsibility of the Bidder pursuant to these two statutes. Certain findings of non-responsibility can result in rejection for contract award and in the event of two findings within a 4-year period the Bidder is debarred from obtaining government procurement contracts.

Section 19.5 State Finance Law §§ 139-l

- (1) Pursuant to N.Y. State Finance Law §139-l, every bid made on or after January 1, 2019 to the State of any public department or agency thereof, where competitive bidding is required by statute, rule or regulation, for work or services performed or to be performed or goods sold or to be sold, and where otherwise required by such public department or agency, shall contain a certification that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all of its employees. Such policy shall, at a minimum, meet the requirements of N.Y. State Labor Law §201-g.
- (2) N.Y. State Labor Law §201-g provides requirements for such policy and training and directs the Department of Labor, in consultation with the Division of Human Rights, to create and publish a model sexual harassment prevention guidance document, sexual harassment prevent policy and sexual harassment training program that employers may utilize to meet the requirements of N.Y. State Labor Law §201-g. The model sexual harassment prevention policy, model sexual harassment training materials, and further guidance for employers, can be found online at the following URL: <https://www.ny.gov/combatting-sexual-harassment-workplace/employers>.
- (3) Pursuant to N.Y. State Finance Law §139-l, any bid by a corporate bidder containing the certification required above shall be deemed to have been authorized by the board of directors of such bidder, and such authorization shall be deemed to include the signing and submission of such bid and the inclusion therein of such statement as the act and deed of the bidder.
- (4) If the bidder cannot make the required certification, such bidder shall so state and shall furnish with the bid a signed statement that sets forth in detail the reasons that the bidder cannot make the certification. After review and consideration of such statement, SUNY may reject the bid or may decide that there are sufficient reasons to accept the bid without such certification.

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- (5) All Bidders must sign and submit the certification attached to this IFB, SUNY [Form 7554-20](#).

Section 20 Additional Terms and Conditions

- (1) The terms and conditions of the State University of New York Construction Agreement (Form 7554-09) shall apply and is provided as an attachment to this IFB.
- (2) The resulting agreement shall be binding upon its execution by both parties and, if required by New York State law, upon the approval of the Attorney General and the Office of the State Comptroller.
- (3) The agreement may be revised at any time upon mutual consent of the parties in writing. Such written consent will not be effective until signed by both parties and, if required by New York State law, approved by the Attorney General and the Office of the State Comptroller.
- (4) The relationship of the Successful Bidder to the University shall be that of independent contractor.
- (5) Compliance with the post-employment restrictions of the Ethics in Government Act is required.
- (6) The submission of a proposal constitutes a binding offer to perform and provide said services.
- (7) In the event the Successful Bidder uses partners, subcontracts or subcontractors, the Successful Bidder will remain responsible for compliance with all specifications and performance of all obligations under the contract resulting from this IFB. For the resulting agreement, the Successful Bidder will be the prime contractor.
- (8) The University will not be liable for any costs associated with the preparation, transmittal, or presentation of any proposals or materials submitted in response to this IFB.
- (9) Public announcements or news releases regarding this IFB or any subsequent award of a contract must not be made by any Bidder without the prior written approval of SUNY.
- (10) The Successful Bidder is responsible for compliance with all applicable rules and regulations pertaining to cities, towns, counties and State where the services are provided, and all other laws applicable to the performance of the resulting contract. The Successful Offeror shall provide all necessary safeguards for safety and protection as set forth by the United States Department of Labor, Occupational Safety and Health Administration.
- (11) The Successful Bidder will be responsible for the work, direction and compensation of its employees, consultants, agents and contractors. Nothing in the resulting agreement or the performance thereof by the Successful Bidder will impose any liability or duty whatsoever on the University including, but not limited to, any liability for taxes, compensation, commissions, Workers' Compensation, disability benefits, Social Security, or other employee benefits for any person or entity.
- (12) In the event the Successful Bidder is required to be reimbursed for travel, Bidder shall be reimbursed at rates not to exceed the current NYS Schedule of Allowable Reimbursable Travel Expenses. Refer to the U.S. Government Administration Rates for Travel at: <http://www.gsa.gov>
- (13) In addition, the University reserves the right to:

- a. Not accept any and all proposals received in response to this IFB, waive requirements or amend this IFB upon notification to all bidders, waive minor irregularities or adjust or correct cost or cost figures with the concurrence of the bidder if mathematical or typographical errors exist.
- b. To terminate any resulting contract for: (1) unavailability of funds; (2) cause; (3) convenience; (4) in the event it is found that the certification filed by the Bidder in accordance with State Finance Law §§139-j and 139-k are found to be intentionally false or intentionally incomplete; and if applicable, the Department of Taxation and Finance Contractor Certification Form ST-220CA was false or incomplete. Upon such finding the University may exercise its termination right by providing written notification to the Bidder in accordance with the written notification terms of the contract.
- c. Request certified audited financial statements for the past three (3) completed fiscal years and/or other appropriate supplementation including, but not limited to, interim financial statements and credit reports.
- d. Contact any or all references.
- e. Request clarifications from Bidders for purposes of assuring a full understanding of responsiveness, and further to permit revisions from all Bidders determined to be susceptible to being selected for contract award, prior to award.
- e. Advise Bidder of any objectionable employee(s) and/or subcontractor(s) and request their removal from the project. Such removal shall not be reasonably withheld by the Bidder.

Section 21 Requirements for Construction Activities To Address Public Health or Safety

- (1) The Bidder agrees it is responsible for complying with any and all requirements issued by federal, state or local entities, including but not limited to New York State Governor Office Executive Orders, New York State Department of Health rules, regulations and guidance, and other New York State or State University of New York laws, rules, regulations or requirements that may be issued and/or amended during the bidding and/or performance of work on this Project.
- (2) With respect to the COVID-19 pandemic, Bidder specifically acknowledges and agrees that the NYS Interim COVID-19 Guidance for Construction Projects is made a part of the contract work for this Project, as set forth in General Requirements. Bidder affirms that all costs and time associated with compliance with the current guidance are included in its bid. The current NYS Interim COVID-19 Guidance for Construction Projects for is available at the following website: <https://forward.ny.gov/industries-reopening-phase#phase-one-construction>. Notwithstanding the foregoing, Bidder agrees to comply with the Guidance as it may be amended or superseded in the future.



NAME OF BIDDER

ADDRESS OF BIDDER

PROPOSAL FOR

Project Number: SU-092923
Project Name: Multi-Purpose Synthetic Turf Facility (Electrical Work)

November 30, 2023

TO THE STATE UNIVERSITY OF NEW YORK:

1. The Work Proposed Herein Will Be Completed Within the timeframe stated on page one of the Agreement. In the event the bidder fails to complete such work by said date or dates, or within the time to which such completion may have been extended in accordance with the Contract Documents, the bidder agrees to pay the University liquidated damages in an amount equal to the values indicate in the Liquidated Damages Schedule below for each calendar day of delay in completing the work.

LIQUIDATED DAMAGES SCHEDULE

<u>Contract Amount</u>	<u>Liquidated Damages</u>
Under \$100,000.....	\$100/day
\$100,000-\$499,999	\$200/day
\$500,000-\$999,999	\$300/day
\$1MM-\$1,999,999	\$400/day
\$2MM-\$3,499,999	\$500/day
\$3.5MM-\$5MM	\$700/day
Over \$5MM (to be determined by the University in each instance)	\$ ____/day

- 2. The bidder hereby declares that it has carefully examined all Bidding and Contract Documents and that it has personally inspected the actual location of the work, together with the local sources of supply, has satisfied itself as to all the quantities and conditions, and understands that in signing this Proposal, it waives all right to plead any misunderstanding regarding the same.
- 3. The bidder further understands and agrees that it is to do, perform and complete all work in accordance with the Contract Documents and to accept in full compensation therefore the amount of the Total Bid, modified by such additive or deductive alternates, if any, as are accepted by the University.
- 4. The bidder further agrees to accept the unit prices, if any, set forth in paragraph (5) of this proposal, except as the same may be modified pursuant to the provisions of Section (5) of the Information to Bidders, as full payment for the amount of the credit to the University for any deletions, additions, modifications or changes to the portion or portions of work covered by said unit prices.

5. BID CALCULATION

a. BASE BID (*does not include allowances*)

\$ _____
(in numbers)

(in words)

b. ALLOWANCES: In accordance with the Schedule II and Section 4.05 of Agreement, the bidder further agrees to the following additions to the Base Bid:

Work or Materials Description	Amount in Words	Amount in Figures
Field Allowance	Thirty-three thousand and thirty-four dollars	\$33,034.00

c. TOTAL BID (*base bid + allowances = total bid*)

\$ _____ (in numbers)

\$ _____ (in words)

d. ALTERNATES: In accordance with Section B of the General Requirements the bidder proposes the following additions to or deductions from the Total Bid for the alternates listed below:

Alternate Number	Add/Deduct	Amount in Words	Amount in Figures

- e. **UNIT PRICES:** In accordance with Section (5) paragraph (2) of the Information to Bidders and Section 4.04 of the Agreement the bidder or the University may insert unit prices for the work or materials listed below for clarification.

Work or Materials Description	Amount in Words	Amount in Figures

- 6. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief: (a) 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; (b) unless otherwise required by law, the prices 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 (c) no attempt has been made or will be made by the bidder to induce any person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

A bid shall not be considered for award nor shall any award be made where (a), (b) and (c) above have not been complied with; provided, however, that if in any case the bidder cannot make the foregoing certification the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefor. Where (a), (b), and (c) above shall have not been complied with, the bid shall not be considered for award nor shall any award be made unless the Campus President, or designee, or Vice Chancellor for Capital Facilities, or designee, determines that such disclosure was not made for purposes of restricting competition.

The fact that a bidder (a) has published price lists, rates, or tariffs covering items being procured, (b) has informed prospective customers of proposed or pending publication of new or revised price lists for such items, or (c) has sold the same items to other customers at the same prices being bid, does not constitute, without more, a disclosure within the meaning of this Section.

- 7. The bidder agrees that if awarded the Contract, it will commence work within (10) calendar days after date of receipt of a fully executed Agreement and that it will fully complete the work by the date stated herein.
- 8. The bidder acknowledges the receipt of the following addenda, but agrees that it is bound by all addenda whether or not listed herein.

Addendum Number	Date	Addendum Number	Date
_____	___/___/___	_____	___/___/___
_____	___/___/___	_____	___/___/___
_____	___/___/___	_____	___/___/___

- 9. The bidder submits herewith bid security in an amount not less than five (5) percent of the Total Bid. In the event that (a) the bidder's Total Bid is the lowest one submitted and the bidder does not timely provide the Post-Bid Information required by the Information for Bidders or (b) this Proposal is accepted by the University and the bidder shall refuse or neglect, within ten (10) calendar days after date of receipt of Agreement, to execute and deliver said Agreement in the form provided herein, or to execute and deliver a Performance Bond and a Labor and Material Bond in the amounts required and in the form prescribed, the bidder shall be liable to the University, as liquidated damages, for the amount of the bid security or the difference between the Total Bid of the bidder and the Total Bid of the bidder submitting the next lowest bid, whichever sum shall be higher, otherwise the total amount of the bid security will be returned to the bidder in accordance with the provisions set forth in the Information for Bidders. The University may apply the bid security in full or partial payments, as the case may be, of said liquidated damages and in the event the bid security is less than the amount of liquidated damages to which the University is entitled, the bidder shall pay the difference, upon demand, to the University.
- 10. The bidder certifies that all wood products that are to be used in the performance of this Contract shall be in accordance with the Specifications and provisions of Section 167 b. of the State Finance Law which Section prohibits the purchase and use of tropical hardwoods.
- 11. The bidder affirms that it understands and agrees to comply with the procedures of the Fund relative to permissible contacts as required by Sections 139-j(3) and 139-j-(6)(b) of the State Finance Law.
- 12. The bidder certifies that all information provided or to be provided to the University in connection with this procurement is, as required by Section 139-k of the State Finance Law, complete, true and accurate.

Dated ____/____/____

Firm's Federal ID Number or
Social Security Number as applicable _____

Legal name of person, partnership, joint venture or corporation:

By _____
(signature)

Title _____

ACKNOWLEDGMENT FOR THE PROPOSAL

THE LEGAL ADDRESS OF THE BIDDER

Telephone No. _____ Facsimile No. _____

If a Corporation

Name	Address
_____ PRESIDENT _____	_____
_____ SECRETARY _____	_____
_____ TREASURER _____	_____

If a Partnership

Name of Partners	Address
_____	_____
_____	_____
_____	_____

If a Joint Venture

Name of Members	Address
_____	_____
_____	_____
_____	_____

If an Individual

Name of Individual	Address
_____	_____



Bidder Name:

Project No.:

Bidders must provide three (3) example projects completed in the past five (5) years in which the Bidder served as the prime contractor. Example projects must be of similar size, scope and complexity to the project currently being bid, as further described in the Description of Work. Each project must include the Owner/Agency, Award Date, Contract Amount, Date Completed, Contact Person, Telephone number of the contact, Architect and/or Engineer's Name, Contract Number, Contact Email, and the Project Title and a brief scope description. Reference contacts may be used to verify project size, scope, dollar value, percentages and quality of performance.

1.	Agency/Owner			Award Date	Contract Amount	Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer		
	Contract No.	Contact Email	Project Title & Scope			
2.	Agency/Owner			Award Date	Contract Amount	Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer		
	Contract No.	Contact Email	Project Title & Scope			
3.	Agency/Owner			Award Date	Contract Amount	Date Completed
	Agency/Owner Contact Person		Telephone No.	Designer Architect and /or Design Engineer		
	Contract No.	Contact Email	Project Title & Scope			
Completed By:				Phone Number:		
				Email:		
				Date:		

Division 1 - General Requirements
SECTION A - Description of Work

1. Work to be Done

The work to be done under the Contract, in accordance with the Contract Documents, consists of performing, installing, furnishing, and supplying all materials, equipment, labor and incidentals necessary or convenient for the construction of **Project SU-092923**, titled **Multi-Purpose Synthetic Turf Facility (Electrical Work)** and carry out all the duties and obligations imposed upon the Contractor by the Contract Documents.

The main features of the work shall include, but not be limited to the following:

- Furnish and install new sports lighting system.
- Electrical service upgrades
- Wiring of Press Box
- Wiring of Dugouts
- Wiring of Bullpen / Batting Tunnels.
- Coordinate scoreboard / shot clock installation with General Construction Contractor

A Full-time construction supervisor, with at least 10 years of experience in similar projects, is required for this project. Working foremen are not considered to be construction supervisors.

2. Work Not Included:

The Contract work does not include items marked "N.I.C"; movable furnishings, except those specified as include on the Drawings; and items marked "by others" as indicated on the Drawings.

SECTION B - Alternates

1. General

- a. Refer to Proposal Form. State thereon the amount to be added to or deducted from the Total Bid for the Alternates described herein.
- b. Extent and details of the Alternates are indicated on the Drawings and described in the Specifications.
- c. Where reference is made in the description of the Alternate to products, materials, or workmanship, the specification requirements applicable to similar products, materials or workmanship in the Total Bid shall govern the products, materials, and workmanship of the Alternate as if these specification requirements were included in full in the description of the Alternates.

2. Alternates – None.

SECTION C - Special Conditions

1. Time Progress Schedule

- a. The Contractor shall schedule the Work for expeditious completion in accordance with Section

0100-1

3.01(2) of the Agreement. The proposed schedule must be established in cooperation with the Campus and account for Campus calendar restrictions listed in this section that affect the Contractor's access to the work areas and construction activities. At each periodic meeting, the Time Progress Schedule required by Section 3.02 of the Agreement shall be reviewed for compliance with phasing requirements. Revise and update the Time Progress Schedule to properly depict the work required to maintain continuity of campus operations.

- b. First phases of work shall include appropriate time in the schedule for: (1) understanding Campus operations, training crews, acclimating trades and Campus to sequence and apportionment of activities; (2) additional meetings (up to twice a week during the first twelve weeks after the Notice to Proceed) with the Owner, consultant and the Contractor's principals, project manager and those of its significant subcontractors; (3) re-sequencing activities to recover from start-up delays in the progressive operation of interrelated work and (4) other activities commonly associated with the start-up of field work.
- c. Academic Calendar: The Contractor is advised that the Campus intends to maintain a full institutional program throughout the Project duration. The Campus will make continuous use of adjacent spaces, buildings and site, except where work is scheduled or specified to occur. All Contract work must be scheduled and performed without causing unscheduled interruption of the normal institutional activities and processes. The Contractor shall coordinate his work with the following Campus Calendar, and No Utility shutdowns will be permitted during Registration, Study Periods, Exam Periods, or Commencement.

<https://www.purchase.edu/offices/registrar/academic-calendar/>

- d. The work site will be available to begin construction immediately upon Notice to Proceed. Unless otherwise indicated, normal working hours on the campus are between 7:30 a.m. and 4:00 p.m. Sequence the work in phases to meet the following interim milestones dates:
- e. On the Date of Substantial Completion in the Proposal, access to the work area for any uncompleted work and for punch list items shall be restricted to after 7:30 a.m. and prior to 4:00 p.m. and comply with the following:
 - 1. Methods of performing work shall not hinder or disrupt the Campus' occupancy, reduce Campus provided levels of cleanliness and ambient environmental conditions and affect building systems, services, and utilities serving the building unless, upon completion of each shift's work that is performed outside of normal Campus work hours, the Contractor provides cleaning to return the work areas to a similar level of cleanliness as normally provided by the Campus, returns spaces to their normal ambient environmental conditions and restores building systems, services, and utilities serving the occupancy.
 - 2. No material or equipment shall remain inside the building unless in the active use and control of Contractor personnel.
 - 3. The Contractor shall provide all utility relocations and re-routings necessary to maintain the existing utilities at their current level of service, including limiting their shutdowns for tie-ins and cutovers to those periods specified. All new work shall be in place, tested and accepted prior to performing a shutdown for the required tie in.
- f. Time Delay Allowance: In addition to the requirements of Article III of the Agreement, the base bid contract duration to perform the work specified in the proposal shall include not less than five (5) consecutive and/or non-consecutive eight hour working days in the Time Progress Schedule for delays that are of no fault of the Contractor or any of its subcontractors or suppliers, or caused by events or conditions that could not be reasonably anticipated. Provide notice of delay per Section 3.04 and request use of this time allowance. When approved by Consultant, the time

allowance is expended for each workday that the contractor is unable to work and all delay time used is tracked in the Time Progress Schedule. After this base bid time allowance for delay is expended, comply with the requirements of Article III for any additional delays.

2. Cutting and Patching

- a. The Contractor shall do all cutting, fitting, and patching of its work that may be required to make its several parts come together properly and fitted as shown upon or reasonably implied from the Drawings and Specifications for the completed project.
- b. Any cost caused by defective or ill-timed work shall be borne by the Contractor. Except as otherwise expressly provided in the Contract Documents, the Contractor shall not cut or alter the work of any other Contractor or existing work without the consent of the University.
- c. Existing construction, finishes, equipment, wiring, etc., that is to remain and which is damaged or defaced by reason of work done under this contract shall be restored by the Contractor to a condition satisfactory to the University, or replaced with new, at no additional cost.
- d. Existing surfaces, materials, and work shall be prepared as necessary to receive the new installations. Such preparatory work shall be as required by the conditions and in each case shall be subject to approval by the University.
- e. Newly exposed work or surfaces which are presently concealed shall be made to match existing corresponding or adjoining new surfaces as directed, and the materials and methods to be employed shall be subject to approval by the University.
- f. All new, altered, or restored work in the building shall match existing corresponding work in the material, construction finish, etc., unless otherwise specified or required by the drawings.

3. Clean-Up

- a. Periodic Cleaning: The Contractor shall at all times during the progress of the work keep the Site free from accumulation of waste matter or rubbish and shall confine its apparatus, materials and operations of its workmen to limits prescribed by law or by the Contract Limit Lines, except as the latter may be extended with the approval of the University. Cleaning of the structure(s), once enclosed, must be performed daily and removal of waste matter or rubbish must be performed at least once a week.
- b. Final Clean Up: Upon completion of the work covered by the Contract, the Contractor shall leave the completed project ready for use without the need of further cleaning of any kind and with all work in new condition and perfect order. In addition, upon completion of all work, the Contractor shall remove from the vicinity of the work and from the property owned or occupied by the State of New York, the State University of New York or the University, all plant, buildings, rubbish, unused materials, concrete forms and other materials belonging to it or used under its direction during construction or impairing the use or appearance of the property and shall restore such areas affected by the work to their original condition, and, in the event of its failure to do so, the same shall be removed by the University at the expense of the Contractor, and it and its surety shall be liable therefor.

4. Temporary Access and Parking

See supplemental Special Conditions for Construction.

5. Field Meetings

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Periodic job meetings will be scheduled by the Consultant and the University during the course of construction. The Contractor, and, upon request of the Consultant and the University, its principal subcontractors and manufacturer's representatives, shall attend such meetings and be prepared to furnish answers to questions on progress, workmanship, or any other subject on which the Consultant and the University might reasonably require information.

6. Operating Instructions and Manuals

The Contractor shall furnish three (3) complete sets of operating instructions and manuals which shall include definite and specific instructions on all mechanical and electrical systems involved in the Project. Said instructions and manuals should set forth: (1) the manner of operation; (2) the necessary precautions and care to be followed; (3) periodic prevention maintenance requirements; and (4) a complete set of spare parts lists, catalogs, service manuals and manufacturing data on said systems. Said instructions and manuals are to be made available by the Contractor for review and comment by the University a minimum of six (6) weeks prior to the scheduled completion of the Project.

7. Utility Shutdowns and Cut Overs

- a. Except as otherwise expressly provided in the Contract Documents, the Contractor shall be responsible for submitting to the University, for its approval, a proposed schedule of all utility shutdowns and Cut overs of all types which will be required to complete the Project; said schedule should contain a minimum of two (2) week's advance notice prior to the time of the proposed shutdown and cut over. Most campuses of the State University of New York are in full operation 12 months of the year, and shutdowns and Cut overs, depending upon their type, generally must be scheduled on weekends, at night, or during holiday periods. The contract consideration is deemed to include all necessary overtime and all premium time, if any, that is required by the Contractor to complete the shutdowns or Cut overs.
- b. Temporary Connections: In the event the Contractor shall disrupt any existing services, the Contractor shall immediately make temporary connection to place such service back into operation and maintain the temporary connection until the Contractor makes the permanent connection. All work must be acceptable to the University.

8. Temporary Power for Construction Activities

Electrical energy will be available at no cost to the Contractor from existing outlets or panels from locations approved by the College. This power may be used for small power tools (not exceeding 1/2 HP), etc., and the Contractor shall not exceed the capacity of the existing circuits being used. The Contractor shall be responsible for providing all necessary connections, cables, etc. and removal of the same at completion of construction with approval from the University. The Contractor shall in no way modify the existing circuits at the panel boards to increase capacities of the circuits. If the required power load exceeds the capacities of the available power sources, the Contractor shall be responsible and pay for furnishing and installing all necessary temporary power poles, cables, fused disconnect switches, transformers and electric meters necessary to provide a temporary power system for the project, and remove the same at completion. Install all temporary wiring and equipment and make all connections in conformity with the National Electrical Code. Make all replacements required by temporary use of the permanent wiring system. Provide ground fault protection.

9. Sanitary Facilities

The Contractor will be permitted to use existing toilet and janitor closet facilities as designated by the College provided the existing facilities are not misused, defaced, or left in an unsanitary condition. If the University deems that the existing facilities have been subject to misuse or left unsanitary, the Contractor shall be informed and caused to install and maintain (at its own cost) temporary, sanitary facilities at approved locations. The Contractor shall also be held responsible for the cost of cleaning and repair of any

damage to said existing facilities and adherence to health and sanitary codes of the State of New York.

10. Temporary Heat

- a. In those locations where it is required by the conditions of the work, the Contractor shall provide and pay for all temporary heating, coverings and enclosures necessary to properly protect all work and materials against damage by dampness and cold, dry out the work, and facilitate the completion thereof. Fuel, equipment, materials, operating personnel and the methods used therefor shall be at all times satisfactory to the University and adequate for the purpose intended. The Contractor shall maintain the critical installation temperatures, provided in the technical provisions of the specifications hereof, for all work in those areas where the same is being performed.
- b. Maintenance of proper heating, ventilation and adequate drying out of the work is the responsibility of the Contractor. Any work damaged by dampness, insufficient or abnormal heating shall be replaced to the satisfaction of the University by and at the sole cost and expense of the Contractor.
- c. The Contractor shall provide all necessary, temporary heating for the efficient and effective work by itself and all trades engaged in the work. Unless otherwise specified, the minimum temperature shall be 50 degrees F at all places where work is actually being performed within the project (where enclosed). Before and during the placing of wood finish and the application of other interior finishing, varnishing, painting, etc., and until final acceptance by the University of all work covered by the Contract, the Contractor shall, unless otherwise specified in the Contract Documents, provide sufficient heat to produce a temperature of not less than 68 degrees F nor more than 78 degrees F.

11. Temporary Light

The contractor shall install, maintain and remove Underwriter's Label temporary lighting sockets, light bulbs, and intermittent power sockets as approved by the University. The minimum temporary lighting to be provided is at the rate of 1/4 watt per square foot and be maintained for 24 hours, 7 days per week at stairs and exit corridors; in all other spaces, temporary lighting is to be maintained during working hours. Installation shall be in accordance with the National Electric Code.

12. Temporary Water for Construction Purposes

Water for construction is available through the campus system without charge to the Contractor from location designated by the College. The Contractor shall obtain the necessary permission, make all connections, as required, furnish and install all pipes and fittings, and remove the same at completion of work. The Contractor must provide for waste water discharge and shall take due care to prevent damage to existing structures or site and the waste of water. All pipes and fittings must be maintained in perfect condition at all times.

13. Conducting Work

- a. All work is to be conducted in such a manner as to cause a minimum degree of interference with the College's operation and academic schedule.
- b. Safe and direct entrance to and exiting from the existing buildings shall be maintained at all times during regular hours while construction is in progress.
- c. No construction work will start in any area until the Contractor has all the required materials on-site.

- d. The Contractor and its employees shall comply with College regulations governing conduct, access to the premises, and operation of equipment.
- e. The building shall not be left "open" overnight or during any period of inclement weather. Temporary weather tight closures shall be provided for/by the Contractor to protect the structure and its contents.

14. Safety and Protective Facilities

- a. The Contractor shall provide the necessary safeguards to prevent accidents, to avoid all necessary hazards and protect the public, the Staff, students, the work and property at all times, including Saturdays, Sundays, holidays and other times when no work is being done.
- b. The Contractor shall erect, maintain and remove appropriate barriers or other devices, including mechanical ventilation systems, as required by the conditions of the work for the protection of users of the project area, the protection of the work being done, or the containment of dust and debris. All such barriers or devices shall be provided in conformance with all applicable codes, laws and regulations, including OSHA and National Fire Prevention Association 241, for safeguarding of structures during construction.

15. Protection of Existing Structures, Vegetation and Utilities

The Contractor, during the course of its work, shall not damage any buildings, structures and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains and electric power and lighting and telephone cables, lawns, curbs, plants and other improvements. Any damage resulting from the Contractor's operations shall be repaired or replaced at its expense.

16. Abbreviations and References

The following abbreviations may be used in these Specifications:

N.A.	Not Applicable
N.I.C	Not in Contract.
Fed. Spec. or F.S.	Federal Specifications
SUCF	State University Construction Fund
University or SUNY	State University of New York
College	A Campus of the State University of New York

17. Use of Elevators

The Contractor shall be permitted to make temporary use of elevators designated by the University and provided such use does not interfere with the normal activities of the College. Large and heavy items shall not be placed in elevators, and suitable padding shall be provided whenever a cab is used for construction purposes. Elevator pits shall be kept free of debris and dust by frequent cleaning out. The elevators shall be restored to original condition satisfactory to the University at the end of construction activities. Use of the top of the elevator may be permitted after obtaining approval of the University.

18. Salvage of Materials

Remove and legally dispose of all debris and other materials resulting from the alterations to State University property. The following items shall remain the property of the University and shall be stored at the site as directed by the University:

Not applicable.

19. Storage of Materials

- a. The Contractor shall store materials and equipment within the contract limits in areas on the site as designated by the University.
- b. All materials shall be stored in a neat and orderly manner, and shall be protected against the weather by raised floored weatherproof temporary storage facility or trailer.
- c. Security for stored materials shall be the responsibility of the Contractor.
- d. Storage of materials is not permitted on the roof of any building.

20. Shop Drawings and Samples - (Refer to Section 2.19 of the Agreement)

- a. The Contractor shall submit to the University for its approval five (5) sets of prints of all shop drawings required by the specifications. Those marked:

"REJECTED" are not in accordance with the Contract Documents and shall be resubmitted.

"REVISE AND RESUBMIT" Contractor shall correct and resubmit.

"MAKE CORRECTIONS NOTED": The contractor shall comply with corrections and may proceed.
Resubmittal is not required.

"APPROVED - NO EXCEPTIONS TAKEN": The contractor may proceed.

- b. All shop drawings and/or submittals used on the construction site must bear the impression of the consultant's review stamp as well as the General Contractor's review stamp, indicating the status of review and the date of review.
- c. All shop drawings shall reflect actual site conditions and accurate field dimensions. Dimensioned shop drawings shall be submitted for all fabricated items. Incomplete submittals will be rejected without review.
- d. All shop drawings, submittals and samples shall include:
 - 1). Date and revision dates.
 - 2). Project title and number.
 - 3). Names of:
 - a). Contractor
 - b). Subcontractor
 - c). Supplier
 - d). Manufacturer
 - 4). Identification of products or materials: Include Department of State (DOS) file number, manufacturers' name and market name of all covered products and applicable materials in accordance with Part 1120 of the Code. This information may be obtained by contacting the DOS, Office of Fire Prevention and Control: 518 474-6746 [voice] and 518 474-3240 [FAX]

21. U.S. Steel

All structural steel, reinforcing steel, or other major steel items to be incorporated in the work shall, if this Contract is in excess of \$100,000, be produced or made in whole or substantial part in the United States,

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its territories or possessions.

22. Non-Asbestos Products

- a. All materials specified herein shall contain no asbestos.
- b. Provide "Contains No Asbestos" permanent labels applied to the exterior jacket of all pipe insulation at 20 foot intervals with a minimum of one (1) label for each service in each work area.

23. Material Safety Data Sheet

The contractor shall submit MSDS (Material Safety Data Sheet) for all chemicals, solvents, and materials specified or proposed to be used on this project.

24. Architect's/Engineer's Seal

In accordance with Rules and Regulations of the New York State Education Law, Title 8, Part 69.5(b), to all plans, specifications and reports to which the seal of an architect has been applied, there shall also be applied a stamp with appropriate wording warning that it is a violation of the law for any person, unless acting under the direction of a licensed architect, to alter an item in any way. If an item bearing the seal of an architect is altered, the altering architect shall affix to his item the seal and the notation "altered by" followed by his signature and the date of such alteration, and a specific description of the alteration.

25. Construction Permit

The Code Compliance Manager for the State University Campus will, as required by law, issue a Construction Permit for this Project. The project is not subject to any local building code or permit requirements, except for work that the Contractor is to perform on property located outside of the boundaries of the campuses of the State University of New York.

26. Other Contracts

There may be other contracts let for work to be done in adjacent areas and, as such, this Contractor and such other contractors shall coordinate their work to conform with progressive operation of all the work covered by such contracts, and afford each other reasonable opportunities for the introduction and storage of their supplies, materials, equipment, and the execution of their work.

27. Asbestos

If the work to be done under this contract contains the abatement of asbestos the following shall apply:

- a. Applicable Regulations - All work to be done under this Contract shall be in compliance with Part 56 of Title 12 of the Official Compilation of Codes, Rules and Regulations of the State of New York (cited as 12 NYCRR Part 56) as amended effective November 9, 1994.
- b. Applicable Variance - The abatement contractor is responsible for obtaining any variance not issued to date that he feels may be applicable to the policies/procedures as set forth in 12 NYCRR Part 56.
- c. Owner Project Fact Sheet -The Contractor shall complete and submit as much information as possible on the Asbestos Material Fact Sheet to the University in triplicate prior to the project startup completion of the Fact Sheet shall be submitted prior to acceptance.

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- d. Patent Infringement - The State University of New York and the State University Construction Fund have been given notice by a law firm representing GPAC, Inc. that the use of its process/procedure for asbestos containment and removal constitutes a patent infringement. All potential contractors are hereby notified that they may have to obtain a license to use certain patented Negative Air Containment systems, and that any liability of the University in connection therewith is covered by Section 2.21 of the Agreement. Therefore, all potential contractors are hereby notified that after opening of the bids they must advise the University as to the system they intend to use for Negative Air Containment and provide the University with either a copy of their license to use the same or written documentation, signed by an authorized officer of their surety, that their performance bond guarantees the Contractor's indemnification covering patent claims.
- e. Air Monitoring - All work to be done under this Contract shall be in compliance with Part 56 of Title 12 of the Official Compilation of Codes, Rules and Regulations of the State of New York (cited as 12 NYCRR Part 56), as currently amended, and applicable federal and state regulations.
- The Owner shall be responsible for hiring and paying an independent third party firm to perform the requirements of air monitoring as called for in 12 NYCRR Part 56 and as permitted in Section 2.17 of the Agreement.
- f. Testing - The University and Campus reserve the right to employ an independent testing laboratory to perform testing on the work and air sampling. The Contractor shall be required to cooperate with the testing laboratory.
- g. Disposal Procedures - It is the responsibility of the asbestos contractor to determine current waste handling, transportation and disposal regulations for the work site and for each waste disposal landfill. The asbestos contractor must comply fully with these regulations, all appropriate U.S. Department of Transportation, EPA and Federal, State and local entities' regulations, and all other then current legal requirements. Submit originals or copies of all pertinent manifests in triplicate to the University.
- h. Submittals - Prior to commencement of the work on this project, the Contractor must submit the following to the University:
- 1). Copy of original insurance policy.
 - 2). Copy of Department of Labor notification.
 - 3). Owner Fact Sheet.
 - 4). Copy of EPA notification.
- i. Special Requirements -
- 1) Size, location, and quantities of all pipes, joints, ducts, valves, tees, etc. must be field verified by all prospective bidders. Information given on the drawings and specifications is for general orientation and information only.
 - 2) The Contractor shall have at least one English-speaking supervisor on the site at all times while the project is in progress.

- 3) Prior to the commencement of work involving asbestos demolition, removal, renovation, the Contractor must submit to the University the name of its on-site asbestos supervisor responsible for such operations, together with documentation that such supervisor has completed an Environmental Protection Agency-approved training course for asbestos supervisors.

28. COVID-19 Contractor Requirements and Guidance for Construction Jobsites

The Contractor will comply with NYS DOH Interim COVID-19 Guidance for Construction Projects, "Guidance", as may be amended or superseded, which is made a part of the contract work for this Project. All costs and time associated with compliance with the current Guidance are included in the Contract consideration in Article IV of the Agreement. The current Guidance for Construction Projects is available at the following website:

<https://forward.ny.gov/industries-reopening-phase#phase-one-construction>

29. Wage Rates and Supplements

The following are the rates of wages and supplements determined by the Industrial Commissioner of the State of New York as prevailing in the locality of the site at which the work will be performed:

Wage Schedules can be accessed online using PRC # **2023013528** at

<https://apps.labor.ny.gov/wpp/publicViewProject.do?method=showIt&id=1559326>

If the Contractor is unable to access the prevailing wage schedule for the **PRC#** listed above, please contact the University for a copy of the wage rate schedule.

Special Conditions for Construction

Part 1 – Use of Premise

1.1 General

- A. Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. *For purposes of this provision, "site" shall include all existing structures.*
- B. The Building in which the Work is to be performed is currently occupied by residential areas, offices and/or classrooms. Each Contractor shall have limited use of premises for construction operations, including use of the Project site, during the construction period. Each Contractor's use of premises is limited only as outlined in this section and/or any other section of the specifications, or at the College's discretion, to perform work or to retain other contractors on portions of Project.
- C. Coordination with Other Contractors:
 - 1). The Contractor will need to have their portion of the Work coordinated with other Contractors working on the site so that their work conforms to the progressive operation of all the work covered under other contracts that the College has let on this site.
 - 2). Each Contractor shall afford other Contractors reasonable opportunities for the introduction and storage of their supplies, materials, equipment, and execution of their work.
 - 3). If the Contractor or such other contractors contend that their work of the progress thereof is being interfered with by the acts or omissions of the others or that there is a failure to coordinate or properly arrange the sequence of the work on the part of the Contractor or such other contractors, they shall, within five (5) working days of the commencement of such interference or failure of coordination or failure to perform work in proper sequence, give written notification to the College of such contention. Upon receipt of such notification or on its own initiative, the College shall investigate the situation and issue such instructions to the Contractor or such other contractors with respect thereto as it may deem proper. The College shall determine the rights of the Contractor and of such other contractors and the sequence of work necessary to expedite the completion of the work covered by said other contracts.
- D. All work is to be conducted in such a manner as to cause a minimum degree of interference with the College's operations and academic schedule. Contractor is to coordinate their work with the College's classroom schedule.
- E. The Contractor and its employees shall comply with all College regulations governing conduct, access to the premises, and operation of equipment.
- F. Maintain all paths of egress and keep clear of all materials and debris.
- G. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, and other adjacent occupied or used facilities without written permission from College.
- H. Should it become necessary, in the judgment of the College, at any time during the course of the Work to move materials which are stored on the site and equipment which has been temporarily placed thereon, the Contractor upon request of the College shall move them or cause them to be moved at its sole cost and expense; provided, however, if materials and equipment that have been stored or placed by the Contractor at a location on the site expressly approved, in writing, by the College and the same are moved or caused to be moved by the Contractor at the College's request, such removal shall be deemed extra work and the Contractor shall be compensated.

1.2 Campus Regulations

- A. The contractor and his/her employees, subcontractors, etc., will not fraternize with any building or campus occupants. This includes but is not limited to students, faculty, and employees of the State other than those designated, visitors and guests. At no time will it be appropriate to say anything derogatory to the above referenced individuals. Harassment, verbal or otherwise, of the above referenced individuals will **not** be tolerated. If an incident arises, the Contractor will be directed to **permanently remove** the employee from the site.
- B. No drugs are permitted on campus.

- C. No smoking is permitted on campus.
- D. The contractor, employees and subcontractors are required to stay within the construction boundary lines at all times.
- E. The contractor, employees, and sub-contractors must recognize the fact that this is an institute for learning. Flexibility will be required during certain times of the academic year.
- F. Each employee of the general contractor and any of their subcontractors must wear clearly visible identification tags while on Campus. Identification tags must at a minimum state what company the employee works for, name of employee, photo identification, and company contact information (including phone number).
- G. **Each employee of the general contractor and any of their subcontractors must adhere to the State and Campus' Covid-19 safety rules and guidance requirements to maintain a safe workplace. The general contractor must request all required forms from the campus' health and safety officer for their firm and any of their sub-contractor firms who will be on-site during the project period. Forms must be signed and submitted prior to any workers arriving on campus.**

1.3 Use of Permanent Utilities

- A. As the building is still an existing building and will be occupied, when each permanent utility is operational, it may be used for construction purposes, if acceptable, in writing, by the College. The written request for permission for use of the system from the College shall include, as a minimum, the conditions and reasons for use and provisions for and effect on equipment warranties. In the event that the College accepts the Contractors use of the permanent utility for the balance of the Work, the Contractor shall be fully responsible for it, and shall pay all costs for operation, power, restoration and maintenance of same.
- B. If the existing facilities are not adequate for the Contractor, locate temporary facilities where they will serve Project adequately and result in minimum interference with performance of the Work and disruption to the College. Any temporary facilities location is to be reviewed and approved by College's Representative.

1.4 Storage and Staging of Materials

- A. The following shall apply to this project
 - 1). The Contractor shall store materials and equipment within areas designated by the College.
 - 2). Security for stored equipment and materials shall be the responsibility of the Contractor.
 - 3). No vehicles will be permitted on the Plaza. Any and all materials and/or equipment brought or stored on the Plaza shall not exceed the maximum weight limit of 150 psf.
 - 4). Access to the construction site for delivery of materials and equipment is limited. Temporary parking for the loading and unloading of the same shall be arranged only with prior approval of the College.
 - 5). The Contractor shall at all times keep access routes, and parking and staging areas clean of debris and other obstructions resulting from the work.
 - 6). Contractors shall not store flammable materials on any roofs.

1.5 Temporary Power for Construction Activities

- A. Electrical energy, as it exists within the work area, will be available at **no** cost to the Contractor from existing outlets or panels from locations approved by the College. If electrical power is not available in the area of work, it is the Contractor's responsibility to provide the necessary power to perform the Work. Typically, available power may be used for small power tools (not exceeding ½ HP).

1.6 Temporary Lighting / Heating & Cooling / Water

- A. Electrical lighting, as it exists within the work area, is available to the contractor at **no** cost. If electrical lighting is not available in the area of work, it is the Contractor's responsibility to provide the necessary temporary equipment to perform the Work at its cost.

1.7 Temporary Sanitary Facilities

- A. Toilet, Water, and Drinking Water Facilities: The Contractor shall **not** use the existing toilet, water, and drinking water facilities. It is the Contractor's responsibility to provide their own temporary toilet facilities during the construction and restore to original state upon completion of the project.

1.8 Temporary Parking

- A. Contractor is to abide to the following:
 - 1). The Contractor and its employees shall be subject to all the rules and regulations of the College, including parking regulations. The College is regulated by New York State Vehicle and Traffic Laws.
 - 2). The Contractor and its employees shall only park in the designated areas in Lot #W-2. There shall be no parking in other areas of the campus (unless prior written authorization is provided by the College Chief of Police).
 - 3). Parking violations are subject to fines and are the sole responsibility of the Contractor or its employees. Vehicles that are parked illegally may be towed at the expense of the owner/driver.
 - 4). All vehicles are required at all times to register with the College's Public Safety Unit.
 - 5). There is a \$35.00 fee for parking permits. The fee is per vehicle and permits need to be displayed whenever the vehicle is parked on campus.

1.9 Temporary Support Facilities

- A. Construction Aids: Provide all items, such as lifting devices, all scaffolding, staging, platforms, runways, ladders; and all temporary flooring, as required by the various trades for the proper execution of the Work. Provide such construction aids with proper guys, bracing, guards, railings and other safety devices as required by the governing authorities and OSHA.
- B. Elevator and Loading Dock Usage: The Contractor shall make all arrangements with the College's Representative for the use of elevators as required for transporting material and workmen to the work areas and for the disposal of rubbish and waste materials.

1.10 Safety and Protection of Facilities

- A. Pre-task planning is essential to ensure safe execution of work. The importance of obtaining all required reviews, approvals, permits and authorizations and selecting appropriate controls as soon as the scope of work is defined, cannot be overstressed. Neglecting to obtain these items "Well in Advance" of project mobilization can result in costly delays.
- B. The Contractor shall provide the necessary safeguards to prevent accidents, to avoid all necessary hazards and protect the public, the Faculty and Staff, students, the work, and the property at all times, including Saturdays, Sundays, holidays, and other times when no work is being done. The Contractor shall submit a safety plan which shall be certified by a Certified Safety Professional from the Board of Certified Safety Professionals (www.bcsp.org).
- C. The Contractor shall adequately address the work scope, potential hazards and controls to be implemented to prevent accidents, by submitting either a project specific health and safety plan or a detailed Job Hazard Analysis (JHA).
- D. Contractors shall refer to the "Purchase College Environmental, Health & Safety Contractor Guidelines" brochure which provides an overview of requirements for working safely. In the event specific details regarding working safely are needed, the contractor shall consult with the Purchase College project manager responsible for the work who will engage the EH&S department as needed.

- E. Contractors shall exercise Stop Work Authority anytime conditions change that introduce new hazards. The hazards shall be reevaluated, and additional controls shall be put in place.
- F. The Contractor shall erect, maintain and remove appropriate barriers or other devices, including mechanical ventilation systems, as required by the conditions of the work for the protection of the users of the project area, adjoining areas, the protection of the work being done, or the containment of dust, debris, and noise. All such barriers or devices shall be provided in conformance with all applicable codes, laws and regulations, including OSHA and National Fire Prevention Association 241, for safeguarding of structures during construction. Any barriers required for the project shall be erected in a manner that does not block or restrict air flow around smoke detectors.

G. Accidents – Personal/Property Damage:

The safety of any employee, agent, consultants, student, staff member or guest of the College or the contractor is a primary obligation of the contractor. The contractor is responsible for ensuring that any construction, renovation, maintenance or other work is managed in a safe and effective manner.

If an accident occurs that results in personal injury or property damage, the contractor shall immediately contact: For situations where people or property are at immediate risk, first:

Purchase College University Police at (914) 251-6900, which will determine if 911 should be called; and then

Capital Facilities Planning at (914) 251-5916 or sean.connolly@purchase.edu
Health & Safety Officer at (914) 251-6022 or louis.wirtz@purchase.edu

H. Fire safety during construction:

- 1). The Contractor shall provide all temporary equipment, labor and materials required for compliance with the applicable provisions of Chapter 33, Fire Safety during Construction and Demolition, of the Fire Code of New York State.
- 2). For areas and spaces under their control, the Contractor shall comply with Chapter 33 of the Fire Code of New York State, titled “Fire Safety during Construction and Demolition”. Subject to approval by the College’s Consultant and the College, the Contractor shall designate one person as the **fire prevention program superintendent**. This superintendent shall be responsible for the fire prevention program required by Section 3308 of the Fire Code of New York State and implementing the minimum safeguards for construction, alteration, and demolition operations that provide reasonable safety to life and property from fire during the Contractor’s operations. Responsibilities also include developing and maintaining pre-fire plans per 3308.3, the training of the Contractor’s workforce per 33308.4, maintenance of the fire protection equipment per 3308.5, supervising hot work operations per 3308.6, and implementing temporary impairment to existing fire protection systems per 73308.7 & 3309.8. This superintendent shall also provide periodic written reports at the field meetings and respond to questions raised concerning compliance with Chapter 33 of the Fire Code of New York State.
- 3). Any tar kettle in use must have a functioning thermometer to check the temperature of the tar. Tar kettle temperature shall never exceed 550 degrees F according to ASTM D312. At a minimum, a 5 lb. ABC fire extinguisher shall be available near, but not next to, the tar kettle.

I. Contractor shall comply with Labor Law Section 220-h; provide workers certified as having successfully completed the OSHA 10-hour construction safety and health course; and comply with applicable NYS DOL rules and regulations for monitoring and reporting compliance.

J. Temporary Fire Protection:

- 1). If the existing building is to be partially occupied during the course of the project, all existing exits and fire protection systems shall be continuously maintained in the occupied spaces/phases, or other

measures must be taken which in the opinion of the College's Consultant and/or College will provide equal safety. Those portions occupied by the College must be available for their use 24 hours a day, seven days a week during the contract period unless otherwise scheduled in these documents. Comply with all applicable State and Federal codes and regulations. The cost of all labor, fire watches, variances, materials, installations, maintenance and removal of such temporary fire protection systems or modifications to the existing systems are the responsibility of the Contractor.

K. Fire Watch Requirements:

- 1). If any of the work of the Contractor;
 - a) Disables any fire suppression systems, standpipes systems, fire alarm systems, fire detection systems, smoke control systems and/or smoke vents as defined in Chapter 9 of the Fire Code of New York State (FCNYS).
 - b) Involves welding, cutting, open torches and other hot work as defined in Chapter 35 of the FCNYS and/or involves demolition activities that are hazardous in nature as defined in Chapter 33 of the FCNYS.

Then the Contractor shall provide a fire watch or perform the work during the hours where the building is scheduled by the College to be closed, in accordance with Section 3304.5 of the FCNYS, for structures that have campus occupancy.

- 2). If a fire watch is required, the Contractor shall provide all labor that is required. The Contractor shall:
 - a) Contact the New York State Department of State Office of Fire Prevention and Control (OFPC) at One Commerce Plaza 99 Washington Avenue – Suite 500, Albany, NY 12210-2833, Phone: (518) 474-6746, Fax: (518) 474-3240, e-mail: fire@dhses.ny.gov and obtain its currently amended recommendation for fire watch procedures. Review the OFPC recommendations and notify the College's Consultant and/or College Representative if there are significant discrepancies with the requirements of this section.
 - b) Review the fire watch procedures with the College's alarm monitoring staff (University Police – 914-251-6900) and the fire department prior to disabling a fire protection system. Submit a plan for the fire watch for approval by the College's Consultant and/or College Representative and schedule a pre-system shutdown meeting with the College's Consultant and/or College Representative.
 - c) Employ, instruct and maintain competent fire watch personnel. Provide the sufficient number of dedicated personnel that are required to patrol all portions of the means of egress system in the facility in the period of time required.
 - d) Notify University Police (UPD) prior to and at the conclusion of the fire watch.
 - e) Employ competent personnel to fix the fire protection system (see section 1.11 below).
- 3). Fire Watch Duties: Personnel serving as a fire watch have the following duties:
 - a) Conduct periodic patrols of the entire facility as specified below.
 - b) Identify any fire, life or property hazards.
 - c) Notify the UPD if a fire is discovered by calling (914-251-6911), with the exact location and type of emergency.
 - d) Notify occupants of the facility of the need to evacuate. If sirens or public address function of the alarm system are still functional, use them to assist with evacuation of the building.
 - e) Have access to at least one means of direct communication with UPD. A cell phone is acceptable.
 - f) Have a suitable fire extinguisher, or extinguishers, in the area for use if needed.
 - g) Maintain a written log of fire watch activities.
 - h) Have knowledge of the location and use of fire protection equipment, such as fire extinguishers. (Note: The fire watch will not perform fire-fighting duties beyond the scope of the ordinary citizen).
 - i) Perform no other duties that are not directly part of the fire watch duties.
- 4). Frequency of Inspections: Fire watch personnel should patrol the entire facility patrol every 30 minutes except in the following situations, where patrols shall be every 15 minutes:

- a) The facility has people sleeping.
- 5). Record Keeping: A fire watch log should be maintained at the facility. The log should show the following:
 - a) Location at/in the facility.
 - b) Times that the patrol has completed each tour of the facility.
 - c) Name of the person(s) conducting the fire watch.
 - d) Records of communication(s) to the University Police.
 - e) Record of other information directed by the College’s Consultant and/of the College Representative.
- L. Protection of Trees:

Fencing will be used to protect trees in construction areas. No activity, traffic, or storage of materials under the “drip line” of trees will be allowed without approval of Facilities Services. Specific tree protection guidelines are available for those projects which may encroach on trees.

1.11 Building Access

- A. Access to buildings and rooms is an important security matter. Improper use of keys, combinations or other means of access to both common and private areas on campus can result in a risk of harm to the safety and security of students and staff. As a result, contractors and their employees must strictly safeguard keys and adhere to any requirements related to building access.
- B. Keys will be issued only at the Facilities Services office Monday through Friday from 7:30 a.m. to 5 p.m. Identification will be required and left in Facilities office for the duration that key is issued. Contractor must provide necessary information in the Access Logbook located within the Facilities office.
- C. Keys must be returned to Facilities Service office at the end of each workday and picked up each morning; unless long-term check out is approved by a Facilities Services Project Manager. If work is starting earlier, or ending later, or on weekends or holidays, this transaction may be completed at the University Police Office, located in the Lincoln Avenue Underpass, which is staffed 24 hours per day. This must be arranged ahead of time with the project manager.
- D. Keys issued to the contractor are the responsibility of the contractor. The cost of replacing locking hardware due to key loss will be charged to the contractor. Contractors are advised that the cost of changing multiple locks accessible off of one key can be significant.
- E. The keys should never be loaned to another individual, as they are the responsibility of the person who signed them. A record of the chain of custody for each key provided to the contractor must be maintained.
- F. Exterior doors and interior fire doors must not be propped open.
- G. Student room doors in all residence halls should remain locked at all times when the university is not in session or students are in residence. Workers who need access will be issued a key to access the room. Each contractor who accesses a room to do work should ensure that the door is locked each time he/she leaves the room.
- H. No existing building security or fire detection system shall be disturbed, altered, disarmed, rendered inoperable, or relocated without the express written consent of the University.

1.12 Modifications / Alterations to Campus Existing Fire Alarm Systems

- A. The Campus standard for its fire alarm is the Edwards Fire Alarm System. Any contractor working on the Campus fire alarm system must be a licensed fire alarm installer. Any contractor working on adding to or

modifying the existing fire alarm system's programming, must be certified to work on an Edwards Fire Alarm System and provide proof of that certification.

- B. A Pre-Fire Alarm construction meeting will be required between the Contractor, their fire alarm subcontractors, and the College's Representative prior to any fire alarm work occurring.
- C. Contractor shall coordinate all modifications and/or alternations to the existing building's fire alarm systems with the College's Representative. If the work shall affect the existing fire alarm system in adjoining areas, the contractor must submit, in writing, their plan to protect and maintain the systems in the adjoining spaces, to the College's Representative for the College's review and approval, at least 72 hours in advance.
- D. Where demolition and dust may impact existing fire alarm smoke heads, the contractor shall protect these heads prior to beginning any work and follow the College's protocol listed below. If smoke heads are protected during the day, while work is occurring, the Contractor must uncover these heads at the end of each workday before leaving the site. The area protected by covered smoke heads must be continuously monitored while the heads are covered. The fire alarm systems must be operational at all times during construction. In the event that there is a need to shut down the system, the Contractor must notify the College in writing at least 72 hours in advance and provide a Fire Watch for all of the areas affected by the shutdown during the times the systems are non-operational.
- E. Where work will impact the existing fire alarm system, the contractor's site supervisor must follow the following protocol:
 - 1) Contractor Supervisor to contact the College's University Police (251-6900) prior to beginning work for the day and let them know where work is occurring, and which smoke heads are being covered or device made inoperable.
 - 2) Cover smoke heads and make scheduled devices inoperable. Call University Police once heads are covered.
 - 3) Contractor to perform scheduled work. The area must be continuously monitored while the smoke heads are covered.
 - 4) At the end of the workday, Contractor Supervisor to College's University Police and let them know smoke head covers are being removed. It's strongly recommended that Contractor let's day's dust settle and clean around the devices prior to removing protective covers to avoid unintended activation.

Part 2 – Party Responsibilities

2.1 Information and Services Required of the College

- A. Furnished Information: College shall furnish (if available) surveys, existing plans, or other required information describing physical characteristics, legal limitation and utility locations for the site of the Project, and a legal description of the site. These documents are for information purposes only. They are to be field verified by the Contractor for accuracy. The College will not be responsible if actual conditions vary from what is indicated on the documents. Plans will be released to awarded Bidder in PDF electronic format.
- B. College's Right to Stop the Work: If Contractor fails to correct Work which is not in accordance with the requirements outlined, or fails to carry out Work in accordance with the Contract Documents, the College, by written order signed personally or by an agent specifically so empowered by the College in writing, may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the College to stop the Work shall not give rise to a duty on the part of the College to exercise this right for the benefit of Contractor or any other person or entity.
- C. College's Right to Carry Out the Work: If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten (10) business-day period after receipt of written notice from College to commence and continue correction of such default or neglect with diligence and promptness, College may, without prejudice to other remedies College may have, correct such deficiencies. *College may offset* from payments then or thereafter due Contractor the cost of correcting such deficiencies, including compensation for

Consultant's additional services and expenses made necessary by such default, neglect or failure. If payments then or thereafter due Contractor are not sufficient to cover such amounts, Contractor shall pay the difference to the College.

2.2 Information and Services Required of the Contractor

- A. Review of Contract Documents: Contractor shall carefully study and compare the Contract Documents with each other and with the information furnished by the College and shall at once report to the College Representative errors, inconsistencies or omissions discovered.
- B. Review of Field Conditions: Contractor shall, *sufficiently in advance of undertaking the Work*, take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to Contractor with the Contract Documents. Errors, inconsistencies or omissions discovered shall be reported to the College Representative at once. *If Contractor performs any construction activity which involves an error, inconsistency or omission which Contractor knew of or should reasonably have known of, without notice to College, Contractor shall assume responsibility for such performance and shall bear all costs of correction.*
- C. Construction Schedule: Contractor, promptly after being awarded the Contract, shall prepare and submit for College Representative, a Contractor's construction schedule for the Work.
- D. Supervision:
- 1). Contractor shall supervise and direct the Work, using Contractor's best skill and attention. Contractor shall be solely responsible for and have control over *construction means*, methods, techniques, sequences and procedures *including safety programs and procedures*, and for coordinating all portions of the Work under the Contract.
 - 2). Contractor shall enforce strict discipline and good order among Contractor's employees and other persons carrying out the Contract. Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.
 - 3). Contractor shall be responsible for inspection of related portions of Work already performed, *as well as existing conditions*, to determine that such are in proper condition to receive subsequent Work.
- E. Contractor shall be responsible to College for acts and omissions of Contractor's employees, Subcontractors and their agents and employees, and other *persons or entities directly or indirectly employed by them* performing portions of the Work under a contract with Contractor
- F. Cutting and Patchwork:
- 1). Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.
 - 2). Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying or load-deflection ratio.
 - 3). Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety (i.e., mechanical systems, plumbing, fire alarm, etc.).
 - 4). Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 5). Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 6). Dispose of demolished items and materials promptly.
 - 7). Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
 - 8). Existing utilities services to the College must be maintained at all times. If the Contractor is required to affect these services in order to complete the Work, Contractor must obtain written permission from the College prior to this work (also see Special Requirements Section). Any damage or disruption of services shall need to be repaired immediately and at the Contractor's expense.

- G. Hot Work Permits:
- 1) If the work requires any Hot Work (including cutting, welding, Thermit welding, brazing, soldering (except soldering electronics or electrical components with an electric soldering iron or gun), grinding, thermal spraying, thawing pipe, installation of torch-applied roof systems or any other similar situation), the Contractor shall be required to obtain a Hot Work Permit issued by the College. The Contractor shall request this through the College Representative and be given a copy of the College's "Hot Work Guidelines and Permit Process" and the permit forms to be filled out. The Contractor must request, submit, and be given a permit before any Hot Work begins. Work scope and work location will be considered when determining the length of time a Hot Work Permit will remain in effect. Significant changes in the work scope or work location will require review of the project and issuance of a new permit.
- H. Cleaning Up:
- 1). Contractor shall *at all times* keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work Contractor shall remove from and about Project waste materials, rubbish, Contractor's tools, construction equipment, machinery and surplus materials.
 - 2). If Contractor fails to clean up as provided in the Contract Documents, College may do so, and the cost thereof shall be charged to Contractor.
 - 3). If a dispute arises among Contractor, separate contractors and College as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described above, College may clean up and allocate the cost among those responsible
 - 4). There shall be no concrete cleanout performed on Campus.
- I. Access to Work: Contractor shall provide College access to *all portions of* the Work in preparation and progress wherever located.

2.3 Communications Protocol for Contract Administration

- A. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, Contractor shall communicate through the College Representative to the College. Communications by and with College's consultants shall be through College Representative. Communications by and with Subcontractors and material suppliers shall be through Contractor.

SPECIFICATION SECTIONS

DIVISION 03 – CONCRETE

Section Number and Title

03 30 00 – Cast-in-Place Concrete

DIVISION 11 – EQUIPMENT

Section Number and Title

11 68 43 – Exterior Scoreboards

DIVISION 26 – ELECTRICAL

Section Number and Title

26 05 00 – Common Work Results for Electrical
26 05 19 – Low Voltage Electrical Power Conductors and Cables
26 05 26 – Grounding and Bonding
26 05 29 – Fasteners, Attachments and Supporting Devices
26 05 32 – Raceways, Fittings and Accessories
26 05 34 – Outlet Junction and Pull Boxes
26 05 43 – Underground Cable and Conduit Systems
26 05 53 – Identification for Electrical Systems
26 22 13 – Dry-Type Distribution Transformers
26 24 16 – Panelboards
26 27 26 – Wiring Devices
26 28 16 – Heavy Duty Safety Switches
26 55 68 – Athletic Field Lighting
26 56 00 – Exterior Lighting

DIVISION 31 – EARTHWORK

Section Number and Title

31 00 00 – Earthwork
31 00 01 – Site Work General Provisions
31 00 02 – Stake Out

DIVISION 03 – CONCRETE

SECTION 033000 – CAST-IN-PLACE CONCRETE WORK

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.

1.02 SCOPE/SUMMARY

- A. In general, the extent of concrete work is shown on the drawings. Provide all labor, materials, equipment, services, and perform all operations required to complete the installation of all work of this section and related work as indicated on the drawings and specified herein, including, but not necessarily limited to, the following:

1. Concrete footings, pile caps, grade beams, foundations, and walls.
2. Concrete steps, platforms, ramps, equipment pads.
3. Interior concrete slabs on grade or fill and elevated slabs.
4. Exterior concrete on grade: Curbs, walks, plazas, stairs, ramps and driveway aprons.
5. Expansion, control and isolation joints in concrete work.
6. Porous fill and vapor barrier for slabs on grade or fill.
7. Floor hardening treatment for interior exposed cement floors and base.
8. Grouting of bearing plates, leveling plates, miscellaneous lintels, and equipment supported on concrete.
9. All forms and reinforcing required for work of this section.
10. Cut, patch, finish, and point concrete and cement work.
11. Pre-molded filler at intersection of floor slabs and exterior wall, and where otherwise indicated (typical at all points abutting vertical surfaces).
12. Installation of water stop material where indicated when necessary.

- B. Work not included: The following items of related work are specified in other sections or contracts.

1. Furnishing of hanger inserts, anchors, leveling plates, sleeves, conduits, etc.
2. Waterproofing and damp proofing.

1.03 RELATED SECTIONS

- A. Section 013563 – LEED Requirements
- B. Section 014523 – Tests, Inspections and Special Inspections
- C. Section 014529 – Testing Laboratory Service
- D. Section 017419 – Construction Waste Management
- E. Section 035416 – Self Leveling Cementitious Underlayment
- F. Section 042000 – Unit Masonry
- G. Section 051200 – Structural Steel
- H. Section 061000 – Rough Carpentry
- I. Section 071000 – Damproofing
- J. Section 071616 – Crystalline Waterproofing
- K. Section 072000 – Building Insulation
- L. Section 072600 – Vapor Retarders
- M. Section 310000 – Earthwork
- N. Section 310002 – Stakeout

1.04 SUBMISSIONS

- A. All submissions to be made in accordance with Section 013300 - Submittal Procedures.
- B. A concrete mix design: Submit laboratory test reports of concrete materials and mix design for each strength of concrete required on the project. Design data shall clearly identify the testing laboratory and provide 28 day strength testing reports representing mix proposed inclusive of all admixtures.
 - 1. Mix design shall also include the following information;
 - a. Minimum design strength intended.
 - b. Cement content
 - c. Water content
 - d. Slag content
 - e. Water cement ratio
 - f. Maximum aggregate size
 - g. Coarse aggregate content
 - h. Fine aggregate content
 - i. Air entrainment by volume
 - j. Adjustment for aggregate moisture slump
 - k. Tested flexural strength
 - l. Tested compressive strength
 - 2. Additional inclusions if required on job:
 - a. Admixtures
 - b. Water reducers
 - c. Accelerators
 - d. Retarders
 - e. Fibers
 - f. Colorants
 - g. Special purpose admixtures
 - h. Corrosion inhibitor
 - i. Viscosity modifiers
- C. Product Data: Submit manufacturer's product data for all materials and items required for the proposed Scope of Work. Including, but not limited to: concrete mix components, reinforcement and forming accessories, wall sleeves, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, hardener/sealers, vapor barriers, non-shrink grit, etc. Product data for materials and items not listed above will be submitted upon the request of the Architect.
- D. Shop Drawings-Reinforcement: Submit complete and accurate shop drawings for approval before any work is executed. The shop drawings submitted by the Contractor shall be independently prepared for him by a Professional Engineer licensed to practice in the State of New York or otherwise within the state where the project is to be constructed and shall completely show the following:
 - 1. Foundation plans and details, including but not limited to: pier plan details, stair sections, exterior wall elevation drawings which show all reinforcing, top of wall elevations, brick shelves & shelf elevations, tops of piers, bottom of footings, stepped footings and elevation changes, bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
 - 2. Floor slab plan indicating elevation variations, recesses, control joints, isolation joints, expansion joints and any proposed cold joints and details of each.

3. Bending and tying diagrams, including typical corners,
 4. Sizes and spacing of members, relationship to contiguous work, fabrication, bending, and placement of concrete reinforcement.
 5. General notes and legends as required.
 6. Drawings shall comply with the latest version of ACI 315 Details and Detailing of Concrete Reinforcement.
 7. Any and all other pertinent information.
 8. Shop drawings must be signed and sealed by licensed professional engineer.
- E. Samples: Submit samples of materials only if requested by the Architect, including names, sources, and descriptions.
- F. Material Certificates: Provide material certificates in lieu of laboratory test reports when permitted by Architect. Material certificates shall be signed by the NYS-licensed Professional Engineer who prepared the shop drawing submittal, certifying that each material item complies with, or exceeds, specified requirements.
- G. LEED Submittals, for LEED projects submit the following:
1. Submit recycled content and regional materials documentation for each type of product provided under work of this Section in accordance with Section 013563 - LEED Requirements.
 2. Credit MR 7: If plywood forms are used, Contractor must submit documentation that the plywood used contains no urea-formaldehyde and that the plywood meets the requirements of LEED MR Credit 7, Certified Wood, by providing wood certification documentation, including chain-of-custody documentation from the manufacturer declaring conformance with the Forest Stewardship Council (FSC) guidelines for certified wood building components.
 3. Manufacturer's verification that steel reinforcement contains at least 90% combined post-consumer and post-industrial recycled content.
 4. Manufacturer's verification that VOC content of interior concrete sealer is less than 250 g/L.

1.05 GENERAL REQUIREMENTS AND QUALITY ASSURANCE

- A. Codes and Standards: Comply with the provisions of the latest version of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
1. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
 2. American Society for Testing and Materials (ASTM) Latest Versions:
 - a. ASTM C 33 "Specification for Concrete Aggregates."
 - b. ASTM C 39 "Test Method for Compressive Strength of Cylindrical Concrete Specimens."
 - c. ASTM C 42 "Methods of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete."
 - d. ASTM C 94/C94 M-00 "Standard Specification for Ready-Mix Concrete."
 - e. ASTM C 150 "Specification for Portland Cement."
 - f. ASTM A 185 "Specification for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement."

- g. ASTM C 260 "Specification for Air-Entraining Admixtures for Concrete."
 - h. ASTM C 309 "Specification for Liquid Membrane-Forming Compounds for Curing Concrete."
 - i. ASTM A 615 "Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement."
3. American Concrete Institute (ACI): Latest Versions
- a. ACI 117 "Standard Tolerances for Concrete Construction and Materials."
 - b. ACI 211 "Recommended Practice for Selecting Proportions Concrete."
 - c. ACI 301 "Specifications for Structural Concrete for Buildings."
 - d. ACI 302 "Guide for Concrete Floor and Slab Construction."
 - e. ACI 304 "Recommended Practice for Measuring, Mixing and Placing Concrete."
 - f. ACI 305 "Hot Weather Concreting."
 - g. ACI 306 "Cold Weather Concreting."
 - h. ACI 315 "Details and Detailing of Concrete Reinforcement."
 - i. ACI 318 "Building Code Requirements for Reinforced Concrete."
 - j. ACI 347 "Recommended Practice for Concrete Formwork."
- B. Quality Control Testing During Construction:
- 1. The Owner will employ an independent testing laboratory to perform tests and to submit test reports. The contractor will be responsible for contacting the testing laboratory to arrange for all sampling, observation and testing. The Owner will pay for all passing tests; all failed tests and any additional testing required due to failed tests will be the responsibility of the contractor.
 - 2. Sampling and testing for quality control during placement of concrete shall include the following as appropriate to scope, as directed by the Architect and in coordination with Section 014523.
 - 3. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - a. Slump: ASTM C 143; one test at point of discharge per truckload or batch of each type of concrete; additional tests when concrete consistency seems to have changed. See 2.05G for slump limits.
 - b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each days' placement of each type of air-entrained concrete.
 - c. Concrete Temperature: Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°C) and above; and each time a set of compression test specimens are made.
 - d. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
 - e. Compressive Strength Tests: ASTM C 39; one set for each day's placement exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
 - 1) When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than five are used.

- f. When total quantity of a given class of concrete is less than 50 cubic yards, strength test may be waived by Architect if, in his judgement, adequate evidence of satisfactory strength is provided.
 - g. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 - h. At the discretion of the Architect the strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
- 4. Test results will be reported in writing to the Architect, Structural Engineer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions, and materials, compressive breaking strength and type of break for both 7-day tests and 28-day tests.
 - 5. Non-destructive Testing: Impact hammer, sonoscope, or other non-destructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
 - 6. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.
- C. The Contractor shall provide a storage box to be used exclusively for the storage and curing of concrete test specimens. This box shall be substantially constructed, made of 1" thick T & G lumber, well braced to prevent warping, or 1/2" thick plywood (exterior grade) may be used. Box shall be provided with a hinged cover and padlock. Storage box shall be so constructed and located on the project site that its air temperature when containing concrete specimens will remain between 60° and 80°F. During the first 24 hours that any test specimens are in the box, electric heating cables or other approved means shall be provided to maintain this temperature during freezing weather. The storage box shall be placed on the site where approved, in location such that it will not be subject to any vibration or disturbance. Storage box shall not be placed in any building or shanty while it is being used for storing specimens.
 - D. Should the average strength of the test cylinders fall below the required strength, the Architect may require changes in the proportion to apply to the remainder of the work or may require load tests and/or cores at the Contractor's expense on the portion of the structure which fails to develop the required strength or may require additional curing, the load test shall conform to the requirements of the Building Code Requirements for Reinforced Concrete (ACI 318, latest edition). If the concrete does not meet the specified requirements, the Architect may condemn such concrete already in place and the Contractor, at his own expense, shall remove such condemned concrete and replace same with new concrete to the satisfaction of the Architect. Use of high early strength cement will not be permitted without written approval of the Architect.

1.06 PROJECT CONDITIONS

- A. General: The contractor shall ensure that all proper project conditions are in place, ready for the setting of forms, reinforcement and subsequent concrete pouring, prior to the commencement of the work. Commencement of work constitutes contractor acceptance of all existing conditions.

1.07 CONTROLLED CONCRETE

- A. Concrete shall be composed of Portland Cement, fine aggregate, coarse aggregate, and water or as otherwise composed via approved mix design.
 - 1. Additional materials may include: slag, admixtures, fibers, colorants, or special purpose admixtures.
- B. All concrete, unless otherwise specified or called for on the drawings, shall be controlled concrete as defined and regulated in the local building code and by the American Concrete Institute and its **ultimate compressive strength at the end of 28 days shall be not less than 4,000 pounds per square inch for foundations, walls and footings, 4,500 pounds per square inch for slabs-on-ground elevated slabs, and other building concrete, and 4,500 pounds per square inch for exterior concrete including, but not limited to, sidewalks, stairs, ramps, driveway aprons and curbing, unless otherwise indicated on structural drawings.**
- C. Before the work is begun, the Contractor shall have preliminary trial tests made by a laboratory approved by the Architect to determine the mixture required to give the strength specified. Concrete shall be designed in accordance with the A.C.I. *Standard Recommended Practice for Selecting Proportions for Concrete* (ACI-513) to produce the strength required. Concrete shall be so designed that the concrete materials will not segregate nor shall excessive bleeding occur. Tests shall be made in accordance with ASTM C-39. The laboratory trial mixture for each mix design shall develop a concrete of compressive strength at 28 days of 1,200 psi higher than the required minimum for each of the strengths indicated to be acceptable for use in the field, but in no case shall cement content be less than 6 bags per cubic yard for 4,000 psi and 6 1/2 bags for 4,500 psi concrete. The proposed mixture must be approved by the Architect before the Contractor proceeds with the work.
- D. Upon approval by the Architect, the Contractor will be allowed to proceed with the work if the laboratory trial mixture develops a compressive strength of 70% of the required ultimate strength at the end of seven (7) days.
- E. If, during the progress of the work, it is found that the required workability and strength cannot be attained with the materials furnished by the Contractor, the Architect may order such changes in proportions or materials or both as may be necessary to secure the desired properties.
- F. The proportions of aggregate to cement shall be such as to produce a mixture which will work readily into the corners and around reinforcement but without permitting the materials to segregate or excess free water to collect on the surfaces. The combined aggregates shall be of such composition of sizes that when separated on the No. 4 standard sieve, the weight passing the sieve (fine aggregate) shall be not less than 40% or greater than 50% of the total, unless otherwise directed. Maximum size of coarse aggregate in slab, beams, and columns shall be 3/4" and in walls and footings 1 1/2".
- G. The source of supply of the aggregate shall not change during the course of the job without previous notice to the Architect, and the materials from any new source shall be subject to acceptance or rejection based upon tests to be made by the Testing Laboratory at the Contractor's expense.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Protect materials delivered from the elements and from otherwise being damaged on site.
- B. Any materials damaged on site due to improper delivery, storage or handling shall not be incorporated in the project and shall be replaced at no cost to the Owner.
- C. Deliver, store and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units which will leave no metal closer than 1-1/2" to surface.
 - 1. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.

2.02 REINFORCING MATERIALS

- A. Reinforcing Bars: All reinforcing steel shall conform to ASTM A615, Grade 60, deformed (60 KSI yield stress) and be rolled from intermediate grade new steel billets.
- B. Welded Wire Fabric: All reinforcement mesh shall be electric-welded wire fabric with an ultimate tensile strength of not less than 55,000 pounds per square inch. All reinforcement mesh shall conform to ASTM A-185.
- C. Supports for Reinforcement: Provide bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications (brick is not acceptable other than for slabs on ground).
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs. Precast concrete bricks are acceptable for slab on ground construction.
 - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).
 - 3. Certified copies of mill reports shall accompany all deliveries of reinforcing steel, identified to indicate the minimum yield strength of the furnished bars.
 - 4. Copies of the manufacturer's affidavit shall accompany all deliveries of welded wire fabric certifying its minimum tensile strength.
- D. For LEED projects all steel reinforcement to contain minimum 90% combined post-consumer and post-industrial recycled content.

2.03 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
1. Use one brand of cement throughout the project, unless otherwise acceptable to the Architect.
- B. For LEED projects Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
1. Provide no more than 25% within the mix for use on exposed slabs on grade, elevated slabs, sidewalks, ramps and stairs.
 2. Provide no more than 40% within the mix for use on foundation walls, grade beams, piers, footings, etc.
- C. Normal Weight Aggregates: ASTM C33, and as herein specified. Provide aggregates from a single source for exposed concrete.
1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
 2. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect.
 3. Coarse aggregates for all stone concrete and fine aggregate shall conform to ASTM Designation C33 - well graded from fine to coarse with the specified limits. The maximum size of the aggregate 3/4" in slabs, beams and columns and 1-1/2" in walls and footings and not larger than one-fifth (1/5) of the narrowest dimension between the sides of the forms of the member for which the concrete is to be used, not larger than three-fourths (3/4) of the minimum clear spacing between reinforcing bars.
 4. Coarse aggregate for stone concrete shall consist of crushed stone or natural or crushed gravel, having clean, hard, strong, uncoated particles free from injurious amounts of soft, thin, elongated, or laminated pieces, alkali, organic, or other deleterious matter.
 5. Fine aggregate for stone concrete - sand, stone screenings, or other inert material with similar characteristics having clean, strong, durable, uncoated grains, and free from lumps, salt, or flaky particles, clay, shale, alkali, organic matter, or other deleterious substance.
 6. Aggregates shall be graded as follows:

<u>Coarse Aggregate</u>	<u>Percent Retained</u>
1" sieve	0
3/4" sieve	0 - 10
3/8" sieve	45 - 80
No. 4 sieve	90 - 100

<u>Fine Aggregates</u>	<u>By Weight Passing</u>
Passing 1/4" square opening	100%
Passing No. 4 sieve	95 - 100%
Passing No. 16 sieve	50 - 85%
Passing No. 50 sieve	15 - 25%
Passing No. 100 sieve	2 - 8%

- D. Anti-shrinkage grout to be used for grouting in of bearing plates, anchors, and inserts shall be Master Builders *"Embecco"* premix or approved equal.
- E. Admixtures shall be used only with the prior written approval of the Architect. All mixtures specified herein or proposed for use by the Contractor shall be of a manufacturer as approved by the Architect and used strictly in accordance with the manufacturer's directions.
 - 1. A set-controlling, water-reducing admixture: *"Pozzolith"* manufactured by Master Builders or approved equal.
 - 2. Air-entraining Admixture: ASTM C-260, certified by manufacturer to be compatible with other required admixtures.
 - a. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - 1) "Air-Mix"; Euclid Chemical Company.
 - 2) "Sika Aer"; Sika Corporation.
 - 3) "MB-VR or MB-AE"; Master Builders.
 - 4) "Darex AEA" or "Daravair"; W.R. Grace.
 - 5) "Edoco 2001 or 2002"; Edoco Technical Products.
 - 6) "Air-Tite"; Gifford Hill/American Admixtures.
 - b. Air-entraining admixtures shall be used for all concrete exposed to weather.
- F. Water: Water used in mixing concrete shall be clean, potable (drinkable), and free from injurious amounts of oils, acids, alkalis, organic materials, or other deleterious materials. (complying with ASTM C94).

2.04 RELATED MATERIALS

- A. Reglets: Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 26 gauge galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
 - 1. Polyethylene sheet not less than 8 mils thick.
- B. Non-shrink Grout: CRD-C 621, factory pre-mixed grout.
 - 1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. Non-metallic:
 - 1) "Set Grout"; Master Builders.
 - 2) "Sonogrout"; Sonneborn-Rexnord.
 - 3) "Euco-NS"; Euclid Chemical Company.
 - 4) "Supreme"; Gifford-Hill/American Admixtures.
 - 5) "Crystex"; L & M Construction Chemical Company.
 - 6) "Sure-Grip Grout"; Dayton Superior Corporation.
 - 7) "Horngrout"; A.C. Horn, Inc.
 - 8) "Five Star Grout"; U.S. Grout Corporation.
- C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per square yard, complying with AASHTO M 182, Class 2.

1. For LEED projects Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
 - a. Provide no more than 25% within the mix for use on exposed slabs on grade, elevated slabs, sidewalks, ramps and stairs.
 - b. Provide no more than 40% within the mix for use on foundation walls, grade beams, piers, footings, etc.
- D. Moisture-Retaining Cover: One of the following, complying with ASTM C 171:
 1. Waterproof paper.
 2. Polyethylene film.
 3. Polyethylene-coated burlap.
- E. Liquid Membrane-Forming Curing Compound: Concrete slabs shall be cured by means of pigmented curing compound of a type not affecting adhesion of resilient flooring or other surface finish, of approved manufacture, conforming to ASTM C-309, and applied in strict accordance with manufacturer's directions. Liquid type membrane-forming curing compound complying with ASTM C 309, Type 1, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.
 1. Available Products: Subject to compliance with requirements, products, which may be incorporated in the work include, but are not limited to, the following:
 - 1) "Masterseal"; Master Builders.
 - 2) "A-H 3 Way Sealer"; Anti-Hydro Waterproofing Company.
 - 3) "Ecocure"; Euclid Chemical Company.
 - 4) "Clear Seal"; A.C. Horn, Inc.
 - 5) "Sealco 309"; Gifford-Hill/American Admixtures.
 - 6) "J-20 Acrylic Cure"; Dayton Superior.
 - 7) "Spartan-Cote"; The Burke Company.
 - 8) "Sealkure"; Toch Div. - Carboline.
 - 9) "Kure-N-Seal"; Sonneborn-Rexnord.
 - 10) "Polyclear"; Upco Chemical/USM Corp.
 - 11) "L & M Cure"; L & M Construction Chemicals.
 - 12) "Klearseal"; Setcon Industries.
 - 13) "LR-152"; Protex Industries.
 - 14) "Hardtop"; Gifford-Hill.
 2. Liquid membrane curing compounds may only be used on slabs where there is no other finish flooring material to be installed.
- F. Bonding Compound: Polyvinyl acetate or acrylic base.
 1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. Polyvinyl Acetate (Interior Only):
 - 1) "Euroweld"; Euclid Chemical Company.
 - 2) "Weldcrete"; Larsen Products Corporation.
 - b. Acrylic or Styrene Butadiene:

- 1) "J-40 Adbond Bonding Agent"; Dayton Superior Corp.
 - 2) "Everbond"; L & M Construction Chemicals.
 - 3) "Hornweld"; A.C. Horn, Inc.
 - 4) "Sonocrete"; Sonneborn-Rexnord.
 - 5) "Acrylic Bondcrete"; The Burke Company.
 - 6) "SBR Latex"; Euclid Chemical Company.
 - 7) "Daraweld C"; W.R. Grace.
- G. Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type," "Grade," or "Class" to suit project requirements.
2. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
- a. "Thiopoxy"; W.R. Grace.
 - b. "Epoxtite"; A.C. Horn, Inc.
 - c. "Edoco 2118 Epoxy Adhesive"; Edoco Technical Products.
 - d. "Sikadur Hi-Mod"; Sika Chemical Corporation.
 - e. "Euco Epoxy 452 or 620"; Euclid Chemical Company.
 - f. "Patch and Bond Epoxy"; The Burke Company.
 - g. "Concresive 1001"; Adhesive Engineering Company.
- H. Joint Fillers / Filler Strips: Joints for slabs on ground shall be formed with preformed, non-exuding bituminous fiber expansion filler, which shall extend full length and depth of slabs. Vertical expansion joints shall be constructed complete with water dams or waterstops and joint filler.
- I. Vapor Barriers: Under typical interior slabs where finished flooring does not involve wood, provide non-woven, polyester, reinforced, polyethylene coated sheet of 15 mil thickness.
1. Vapor barrier membrane must have the following properties:
- a. Permeance as tested after mandatory conditioning (ASTM E 1745 paragraphs 7.1.2-5): less than 0.01 perms (gran/ft²/hr/in-Hg).
 - b. Other performance criteria:
 - 1) Strength: Class A (ASTM E 1745).
 - 2) Minimum thickness of plastic retarder material: 15 mils.
 - c. Basis of Design: Stego Wrap 15-mil Vapor barrier by Stego Industries, LLC.
 - d. Or Architect approved equal.
- J. Vapor barrier under interior slabs where finished flooring involves wood assemblies such as gymnasium and stages provide bituminous vaporproofing/waterproofing membrane.
1. Vapor barrier must have seven-ply, weather-coated, permanently bonded, semi-flexible bituminous core board composed of a 3-ply plasmatic matrix sealed between liners of asphalt-impregnated felt and a glass mat liner. Vapor barrier shall consist of an asphalt weather coat and covered with a polyethylene anti-stick sheet. Vapor barrier shall meet or exceed all requirements of ASTM E 1993-98 and shall have the following characteristics:
- a. Minimum permeance ASTM F1429, calibrated to ASTM E96, Water Method: 0.0011 Perms.
 - b. Tensile Strength ASTM E154, Section 9: 156 LBS. force.

- c. Puncture Resistance ASTM E154: 149 LBS. force/inch.
 - d. Pre-molded Membrane® Vapor Seal with Plasmatic Core by W.R. Meadows, W.R. Meadows, Inc., PO Box 338, Hampshire, Illinois 60140-0338. (800) 348-5976. (847) 683-4500. Fax (847) 683-4544. Website: www.wremeadows.com.
- K. Water Stops: Provide all waterstops similar to or equal to those as produced by *Greenstreak, Inc.*, as required by the drawings, either embedded in concrete, or across and/or along the joint, to form a watertight diaphragm that prevents the passage of fluid through the joint.
- L. All other materials as hereinafter specified. All set-in-place concrete elements (i.e. – pre-fabricated water stops, cast aluminum nosings, exterior stair components, etc.) shall be installed in conformance with their associated specification sections, and/or manufacturer's installation instructions if no specification is provided and in complete coordination with the work of this Section.

2.05 PROPORTIONING AND DESIGN OF MIXES

- A. Design mix of all concrete shall provide the following properties, as indicated on the drawings and schedules:
1. 4,000 psi 28-day compressive strength; W/C ratio, 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained).
 2. 4,500 psi 28-day compressive strength; W/C ratio, 0.67 maximum (non-air-entrained), 0.54 maximum (air-entrained).
 3. Do not air entrain concrete for trowel finished interior floors and suspended slabs, including polished concrete floors. Do not allow entrapped air content to exceed 3 percent.
- B. Stone concrete shall weigh approximately 144 pounds per cubic foot. Exterior concrete, exposed to weather, shall have a water cement ratio not to exceed 6 1/2 gallons per sack of cement and an air entraining agent approved by the Architect to be added to obtain concrete with an air content not less than 4% nor more than 6% conforming to ASTM C-175, latest edition.
- C. Prepare design mixes for each type and strength of concrete laboratory trial batch methods as specified in ACI 301. Use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.
- D. Submit written reports to Architect and Structural Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed and accepted by the Architect.
- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to the Owner and as accepted by the Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Architect before using in work.
- F. Admixtures: **ONLY TO BE USED WITH PRIOR WRITTEN APPROVAL OF THE ARCHITECT!**
1. Use water-reducing admixture or high range water-reducing admixture (super plasticizer) in concrete as required for placement and workability.

2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50°F (10°C).
 3. Use high-range water-reducing admixture in pumped concrete, concrete for industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water/cement ratios below 0.50.
 4. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:
 - a. Concrete structures and slabs exposed to freezing and thawing, de-icer chemicals, or subjected to hydraulic pressure.
 - b. 4.5 percent (moderate exposure).
5.5 percent (severe exposure) 1-1/2" maximum aggregate.
 - c. 4.5 percent (moderate exposure)
6.0 percent (severe exposure) 1" maximum aggregate.
 5. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.
- G. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramps, slabs, and sloping surfaces: Not more than 3".
 2. Reinforced foundation systems: Not less than 1" and not more than 3".
 3. Concrete containing HRWR admixture (super-plasticizer): Not more than 8" after addition of HRWR to site-verified 2"-3" slump concrete.
 4. Other concrete: Not less than 1" and not more than 4".

2.06 MIXING

- A. All concrete shall be machine mixed or transit mixed.
- B. Hand mixing will not be permitted unless approved by the Architect. Mixing shall conform to ASTM C-94 and ACI-304. On-site mixing will not be permitted unless approved by the Architect/Engineer.
- C. Machine mixing shall be done in an approved batch mixer. Sand and gravel shall be measured by weighing. Mixing shall be continued for at least one minute after all materials are in the mixing drum at a speed of not less than twelve nor more than eighteen revolutions per minute. The volume of the mixing materials per batch shall not exceed manufacturer's rated capacity of mixer. A water gauge shall be provided to deliver the exact predetermined amount of water for each batch. Mixing shall be continued for at least 1 minute for 1 cubic yard of concrete plus 1/4 minute for each additional cubic yard of concrete after all materials.
- D. Transit mix concrete shall conform to the specification and tests herein described and to ASTM C-94 and ACI-304, most current edition(s); and further provided that the central plant producing the concrete and equipment transporting it are, in the opinion of the Architect, suitable for production and transportation of controlled concrete. The maximum elapsed time between the time of the introduction of water and placing shall be one hour.

- E. Exterior concrete exposed to weather: Water cement ratio shall not exceed 6 1/2 gallons per sack of cement and an air-entraining agent approved by the Architect shall be added to obtain concrete with an air content not less than 4% nor more than 6% conforming to ASTM C-175, latest edition.
- F. Ready-mix Concrete: Comply with the requirements of ASTM C 94, and as specified herein.
 - 1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall notify the Architect, Construction Manager (when applicable) and the approved testing laboratory at least 24 hours in advance of the time he intends to use ready mixed concrete so that an inspector may be assigned to the plant to supervise the mix, and be available at the site to witness pour and sampling.
- B. With each delivery of concrete, furnish to the superintendent at the building site a delivery slip (certified by laboratory representative) showing mix, quantity of cement, fine and coarse aggregates, and water, and time of departure from the plant.
- C. Under no circumstances shall transit-mixed concrete be delivered from the plant, unless mix design has been approved by the Architect and inspector of testing laboratory. The approved plant and its operating equipment shall be under the supervision of the testing laboratory appointed by and directly responsible to the Architect.
- D. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

3.02 FORMS

- A. Design, erect, support, brace, and maintain form work to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.
- B. Design form work to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms to sizes, shapes, lines, and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features required in the work. Use selected materials to obtain required finishes. Solidly butt joints and provide back up at joints to prevent leakage of cement paste.
- D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
 - 1. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.
- E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for

inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

- F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- G. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- H. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, etc., or other debris just before concrete is placed. Retightening forms and bracing after concrete placement as required to eliminate mortar leaks and maintain proper alignment.

3.03 PREPARATION OF FORM SURFACES

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.
- B. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.
- C. Thin form-coating compounds only with thinning agent of type, amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- D. Coat steel forms with a non-staining, rust preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.04 VAPOR RETARDER INSTALLATION

- A. Following leveling and tamping of granular base for slabs on grade, place vapor retarder sheeting with longest dimension parallel with direction of pour. Lap joints and seal with appropriate tape.
- B. All concrete slabs on grade or fill shall receive membrane placed on porous fill prior to placing reinforcing. Membrane shall be placed with 6" laps at ends and sides, and without tears or ruptures at the time concrete is placed thereon.
- C. Both standard vapor barrier and pre-molded membrane when applicable shall be installed in accordance with the manufacturers requirements.

3.05 PLACING OF REINFORCEMENT

- A. Comply with *Concrete Reinforcing Steel Institute's* recommended practice for "*Placing Reinforcing Bars*", for details and methods of reinforcement placement and supports, and as specified herein.
- B. All reinforcement shall be rigidly wired in place with adequate spacers and zinc coated tie chairs. Bar supports shall be not more than 4'-0" o.c. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete. Reinforcement for concrete slabs on ground or fill shall be supported on precast concrete bricks. On formwork, galvanized coated chairs or spacers shall be used.
- C. Reinforcement shall be placed so that where temperature shrinkage of bars occur, they shall be no closer to top of slab than 3/4". Coordinate with work under Electrical Contract so that conduits may

be replaced to obtain this result.

- D. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers as required.
- E. All reinforcement shall be bent cold. The minimum radius of bend shall be 4 diameters for bars 5/8" round or less and 6 diameters for larger bars.
- F. Place reinforcement to obtain at least minimum coverage for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- G. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace overlaps with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- H. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier in accordance with manufacturer's requirements before placing concrete.
- I. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coating with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.
- J. Zinc-Coated Reinforcement: Repair, cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

3.06 EXPANSION JOINTS

- A. Joints for slabs on ground shall be formed with preformed, non-exuding bituminous fiber expansion filler, which shall extend full length and depth of slabs.
- B. Vertical expansion joints shall be constructed complete with water dams or waterstops and joint filler.
- C. Joint material in exterior concrete, sidewalks, plazas, stairs, ramps, curbs, etc. shall be held 1/4" from finished surface and finished with approved traffic grade sealant.

3.07 OTHER JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints to girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Space vertical joints in walls as indicated per typical detail. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construction contraction joints for a depth as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2 mm-) wide joints 1" deep into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealant," are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip section together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.08 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.
1. Install reglets to receive top edge of foundation sheet waterproofing, and to receive thru-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
 2. Install anchor bolts, accurately located, to elevations required.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed straps for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

3.09 CONCRETE PLACEMENT

- A. The Contractor shall notify the Owner, the Architect, the Construction Manager (when applicable)

and the testing laboratory at least 48 hours in advance of the time he intends to place concrete in order to afford them the opportunity to observe placing operations. The Contractor shall obtain the Architect's and testing laboratory's permission prior to placing concrete.

- B. All forms must be absolutely clean and free from shavings and dirt prior to starting concrete operations.
- C. Under no circumstances shall concrete be deposited in or under water, nor on muddy or frozen ground.
- D. Pre-placement Inspection: Before placing concrete, the Contractor shall inspect and complete all formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used. Protect adjacent finish materials against spatter during concrete placement.
 - 1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement under any and all conditions of placement.
- E. General: Comply with ACI 304 *"Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete"* and as herein specified.
 - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
 - 2. Before depositing new concrete against concrete which has set, the forms shall be re-tightened and the surface of the concrete placed earlier shall be thoroughly roughened, cleaned of all foreign matter and laitance, shall be slushed with water, slushed with a coat of neat cement grout, and the new concrete shall be placed before the grout has attained its initial set, or the work shall be performed in such other approved manner as will insure a thorough bonding to the work.
- F. All concrete must be placed as rapidly as possible after mixing and thoroughly spaded and rammed in place. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. All possible care is to be exercised to prevent honeycombing. Concrete shall be placed in layers not over 12" thick and shall not be dumped from height over three feet. Concrete that must be placed more than 3 feet below placement level shall be chuted at a slope of not more than 1 in 2 or deposited through elephant trunks.
- G. Concrete shall be placed in one operation up to temporary bulkheads, which shall be located, in general, at points of minimum shear.
- H. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 12" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 - 2. All structural concrete shall be placed with the aid of mechanical vibrators. The vibrators shall be of a type and design approved by the Architect and shall be capable of transmitting to the concrete not less than 3,000 impulses per minute. The vibration shall be sufficiently intense to visibly affect the concrete over a radius of at least 2'-0" around the point of application but shall not be applied long enough to segregate the ingredients. Insert and withdraw vibrators vertically

at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. Enough vibration shall be used to cause all the concrete to flow or settle readily into place. The vibration shall be of internal type, applied directly to the concrete and not through the forms, except in sections too thin to permit the insertion of the internal type, in which case form vibration may be employed at the discretion of the Architect. Do not use vibrators to transport concrete inside forms.

- I. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 3. Maintain reinforcing in proper position during concrete placement operations.
 4. Slope surfaces uniformly to drains where required.
 5. For exterior placement such as sidewalks, plazas, driveway aprons, curbing and equipment pads where no vapor barrier is required, the subgrade shall be moist before placing concrete. Dry or dusty subgrades shall be moistened to a minimum depth of one inch (1") prior to placing concrete.
- J. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
 1. When air temperature has fallen to or is expected to fall below 40°F (4°C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F (10°C), and not more than 80°F (27°C) at point of placement.
 - a. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - b. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
 - c. Protection of Footings Against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against possibility of freezing; maintain cover for time period as necessary.
- K. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified. Concrete placed in warm weather shall be kept well sprinkled with water for at least one week after placing, unless other approved curing methods are used. No concrete shall be placed when the atmospheric temperature is above 90°F.
 1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90°F (32°C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
 - a. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
3. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions, only upon approval of the Architect.

3.10 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed to view in the finish work or by other construction, unless otherwise shown or indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed to view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Smooth Rubbed Finish: Provide smooth rubbed finish to scheduled concrete surfaces, which have received smooth form finish treatment, immediately following form removal and not later than one day after form removal.
 1. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.
- D. Grout Cleaned Finish: Provide grout cleaned finish to scheduled concrete surfaces which have received smooth form finish treatment.
 1. Combine one part Portland cement to 1-1/2 parts fine sand by volume, and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that final color of dry grout will match adjacent surfaces.
 2. Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.
- E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off, smooth, and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 MONOLITHIC SLAB FINISHES

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.
 1. After placing slabs, plane surface to tolerances for floor flatness (F_F) of 15 and floor levelness (F_L) of 13. Slope surfaces uniformly to drains where required. After leveling, while sill plastic, roughen surface before final set, with stiff brushes, brooms, or rakes to provide a profile amplitude of 1/4 inch (6 mm) in one direction.

- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.
1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Check and level surface plant to tolerances of F_F 18 - F_L 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- C. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system and below wood flooring systems.
1. After floating, begin first trowel finish operation using a hand or power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances according to ASTM E 1155 (ASTM E1155M) for a randomly trafficked floor surface. Grind smooth surface defects which would telegraph through applied floor covering system.
 - a. Specified overall values of flatness: (F(F)35, and levelness, F(L)25, with minimum local values of flatness F(F)24 and levelness F(L)17 for slabs on grade.
 2. Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch (3.2 mm).
- D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with either thin-set or thick-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming. Comply with flatness and levelness tolerances for trowel finished floor surfaces.
- E. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, sidewalks, plazas, aprons, curbs and ramps, and elsewhere indicated.
1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- F. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms and ramps. Apply according to manufacturer's written instructions and as follows:
1. Uniformly spread 25/100 sq. ft. (12 kg/10 sq. m) of dampened slip-resistive aggregate over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.
 2. After broadcasting and tamping, apply float finish.
 3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.

- G. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions as follows:
1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. (49 kg/10 sq. m) unless greater amount is recommended by manufacturer.
 2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
 3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.12 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting; keep continuously moist for not less than 7 days.
 2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
 3. The Contractor shall continuously protect cement finish floors from damage for the duration of the work by such means as approved by the Architect and shall leave same in perfect condition to receive other floor finishes or where exposed in the finished work, they shall be in perfect condition at completion and acceptance of the building.
- B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified as appropriate to finished condition of concrete surface.
1. Provide moisture curing by following methods:
 - a. Keep concrete surface continuously wet by covering with water.
 - b. Continuous water-fog spray.
 - c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and continuously keeping wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
 2. Provide moisture-cover curing as follows:
 - a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Provide curing and sealing compound to exposed interior slabs (no other finish materials) and to exterior slabs, walks, and curbs as follows:
 - a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas

subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

- b. Do not use membrane curing and sealing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, vinyl tile, linoleum, glue-down carpet, etc.), painting, and other coatings and finish materials unless otherwise acceptable to the Architect.
- C. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- D. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.
 - 1. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture retaining cover, unless otherwise directed.

3.13 REMOVAL OF FORMS

- A. Form work not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F (10°C) for 24 hours after placing concrete, provided concrete is sufficiently hard not to be damaged by form removal operations and provided curing and protection operations are maintained.
 - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete-in-place unit concrete has achieved at least 70 percent of its 28-day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit remove of forms without loosening or distributing shores.
- B. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.14 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new form work.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms close to joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to the Architect.

3.15 SHORES AND RESHORES

- A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and re-shoring.
 - 1. Do not remove shoring or re-shoring until measurement of slab tolerances is complete.
- B. In multi-story construction, extend shoring or re-shoring over a sufficient number of stories to

distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

- C. Plan sequence of removal of shores and re-shores to avoid damage to concrete. Locate and provide adequate re-shoring support construction without excessive stress or deflection.

3.16 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer finishing machines and equipment.
 - 1. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and finish concrete surfaces as scheduled.
- E. Pits, Trenches, etc.: Build all pits, pit cleanouts, trap pits, trenches, curbs, and pads as required by the drawings and by job conditions.
- F. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous watertight diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- G. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.17 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.
 - 1. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Before placing cement mortar, thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
 - a. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

- B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains or other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar or precast cement cone plugs secured in place with bonding agent.
1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.
1. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
 2. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
 3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Patching compounds may be used when acceptable to Architect.
 4. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 5. Repair isolated random cracks and single holes not over 1" diameter by dry-pack method. Groove top of cracks and cutout holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.
 6. Perform structural repairs with prior approval of Architect or Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.
 7. Repair methods not specified above may be used, subject to acceptance of Architect.

3.18 CUTTING, PATCHING, AND REMOVAL

- A. The Contractor shall be responsible for all cutting and patching of his work as required to accommodate work of this section and of other sections and contracts.
- B. Materials which have become damaged or have been condemned shall be removed from the site.

END OF SECTION

DIVISION 11 – EQUIPMENT

SECTION 116843 – ELECTRONIC SCOREBOARDS

PART 1 – GENERAL

1.01 DESCRIPTIONS OF WORK

- A. The work of this Section includes exterior, wireless, LED electronic scoreboards including control center and other accessories for complete functional installation.
- B. Supply and install scoreboards and controllers including concrete footings and steel support posts, wiring of the scoreboard and furnish and install disconnect switch and convenience outlet at each scoreboard.

Note: The General Contractor shall supply and install the support steel and concrete footings for scoreboard A and B. The electrical contractor shall supply, install, and wire the scoreboards and accessories.

1.02 RELATED SECTIONS

- A. Section 033000 – Cast-In-Place Concrete
- B. Section 099000 – Painting
- C. Section 310000 – Earthwork

1.03 REFERENCES

- A. National Electrical Code (NEC).
- B. American Society for Testing and Materials (ASTM) Publications:
 - 1. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
 - 2. ASTM A6 – Steel Shapes
- C. Federal Communications Commission, Part 15 Rules & Regulations, EN60950-1, EN55022 & EN55024.
- D. UL and C-UL Standard for Electric Signs
- E. Building Code of New York State, latest edition.

1.04 SUBMITTALS FOR REVIEW

- A. Submittals shall be in accordance with Section 013300 – Submittal Procedures.
- B. Product data for scoreboards, controls, and accessories shall include descriptions of control functions etc.
- C. Installation drawings, face layout, dimensions, construction, electrical wiring diagrams, and method of anchorage.
- D. Copy of guarantee for review by Architect.
- E. Manufacturer's installation instructions.

- F. Finish Samples.

1.05 QUALITY ASSURANCE

- A. All components including scoreboard, control center, control cable, and other accessories and installation hardware shall be products of a single manufacturer.
- B. Manufacturer qualifications: Company specializing in manufacturing electronic scoreboards with 10 years minimum successful world-wide experience.
- C. Scoreboards shall be designed for exterior installation with weatherproof housing and optical isolation circuitry to reduce potential damage from electrical storms.
- D. Should service be necessary, specialized personnel shall not be required. Modular “plug and play” components will be housed in an internal protective enclosure.
- E. Scoreboards and other electrical components shall be certified for use in United States and Canada by Underwriter Laboratories, (UL) Inc. and shall bear either UL or C-UL label only.
- F. Scoreboards and other electrical components shall be electrically grounded in accordance with National Electrical Code (NEC), Article 600.
- G. Scoreboard cabinetry and attachment shall meet or exceed the 2009 IBC standard of 150 mph wind loading.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protect scoreboard from damage during delivery and store under tarp when time from delivery to installation exceeds one week.

1.07 GUARANTEE

- A. Provide under provisions of Section 017000 – Contract Closeout.
- B. Guarantee to cover defects in materials and workmanship.
 - 1. 1 years parts and factory labor guarantee for scoreboards, [wired controls,] and accessories from invoice date.
 - 2. 2 years part and factory labor guarantee for wireless controls and receivers from invoice date.
 - 3. Lifetime telephone support.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. Daktronics, Inc., 201 Daktronics Drive, P.O. Box 5128, Brookings, South Dakota 57006-5128, or approved equal. Local representative, Long Island Gym, (631) 666-9511.
- B. The specified manufacturer / product(s) have been selected to establish a level of quality and do not prohibit equivalent manufacturers or their products. Requests to use equivalent (equal)

products of other manufacturers shall be submitted with the bid, in accordance with the General Conditions.

2.02 PRODUCTS

A. Scoreboard A – Softball Field (Baseball) - **Daktronics BA-2125** single-sided baseball scoreboard displays HOME and GUEST scores for up to 10 innings, total RUNS, to 99 and ER (errors) to nine for each team, AT BAT to 99, BALL to three, STRIKE to two, OUT to two and H/E (hit or error) with field position number for the error. Scoreboard can show TIME, or PITCH COUNT instead of AT BAT , as well as AT BAT or Pitch County on ;ace of H/E.

1. Scoreboard must be capable of scoring the following sports;

a. Softball / Baseball

B. Scoreboard B - Multi-Use Field - **Daktronics MS-2009** single-sided multi-sport scoreboard displays period time to 99:59, HOME and GUEST scores to 99, PERIOD to nine, PLAYER number to 99 and PENALTY time to 9:59 for two players on each team and indicates team penalty. During the last minute of the period, the clock displays time to 1/10 of a second.

1. Scoreboard must be capable of scoring the following sports;

a. Soccer
b. Lacrosse

C. Shot Clocks

1. Provide two (2) Lacrosse Shot Clocks, **Model TI-2015**.

2.03 MATERIALS

A. **Scoreboard A** – General Information

1. Dimensions: 7'-0" high, 25'-0" wide, 0'-8" deep.

2. Base weight: 955 lbs with TNMCS and vinyl captions.

3. Base power requirement: 930 W, 7.8 Amps.

4. White LED digits.

5. Color: over 150 colors to choose from.

6. Construction

a. Alcoa aluminum alloy 5052 construction
b. Scoreboard back, face and perimeter: 0.063" thick
c. Scoreboard top and bottom: 0.125" thick
d. Digit faceplates: 0.063" thick

7. Digits

a. All digits White LED.
b. At Bat, Ball Strike and Out digits: 18" high
c. All other digits: 24" high

- d. Seven bar segments per digit
- e. White PanaView® LED digit technology, Sealed weather tight.

8. Captions

- a. Vinyl applied directly to scoreboard face, except Options where noted as TNMC's, digital, LED type.
- b. AT BAT, BALL, STRIKE, OUT and H/E captions: 18" high.
- c. All other digits are 15" high.

- d. Color: As selected by the Owner.

9. Options

- a. Provide optional Arch Truss panel above scoreboard with School and Mascot Names.
- b. Scoreboard striping – same color as captions.
- c. Dimmable digits.
- d. Programmable LED Team Name Message Centers (TNMCs), 2 each.
- e. GHz spread spectrum radio receiver.
- f. Individual digit protective screens.
- g. All Sport 5000® console.
- h. PanaView® LED digit technology and option edge striping.

B. **Scoreboard B** – General Information

- 1. Dimensions: 10'-0" high, 25'-0" wide and 0'-8" deep.
- 2. Base weight: 1,270 lbs with TNMCS and electronic captions.
- 3. Base power requirement: 1500 W, 12.8 Amps
- 4. Color: over 150 colors to choose from.
- 5. Construction
 - a. Alcoa aluminum alloy 5052 construction
 - b. Scoreboard back, face and perimeter: 0.063" thick
 - c. Scoreboard top and bottom: 0.125" thick
 - d. Digit faceplates: 0.063" thick
- 6. Digits
 - a. All digits White LED.
 - b. Clock and Score digits are 24" high.
 - c. All other digits are 18" high.
 - d. Seven bar segments per digit.
 - e. White PanaView® LED digit technology
- 7. Captions
 - a. Optional Electronic Captions, digital, LED type.
 - b. HOME and GUEST captions: 15" high .
 - c. PLAYER and Penalty are 9" high.
 - d. Period caption is 10" high.

e. Color: As selected by the Owner.

8. Options

- a. Scoreboard striping – same color as captions.
- b. Programmable LED Team Name Message Centers (TNMCs).
- c. Electronic Captions.
- d. GHz spread spectrum radio receiver.
- e. Individual digit protective screens.
- f. All Sport 5000® console.
- g. PanaView® LED digit technology and option edge striping.

C. **Shot Clocks**

1. Dimensions: 2'-4" high, 3'-4" wide and 0'-8" deep.
2. Base weight: 36 lbs.
3. Base power requirement: 35 W, 0.3 Amps
4. Digits
 - a. All digits Amber LED.

2.04 ACCESSORIES

- A. Provide each scoreboard or accessory with control cable of length required and all electrical junction boxes, conduits, mounting hardware, and other accessories as required for a complete installation.

2.05 SCORING CONSOLES

- A. Consoles shall be All Sport® 5000 controller.
- B. Capable of scoring multiple sports through the use of keyboard inserts.
- C. Capable of controlling other All Sport controlled scoreboards.
- D. Console has a maximum power requirement of 6 watts.
- E. Console recalls clock, score, and period information if power is lost
- F. Console includes:
1. A rugged aluminum enclosure to house electronics.
 2. A sealed membrane water-resistant keyboard.
 3. A 32-character liquid crystal prompting display to verify entries and recall information currently displayed.
 4. A 6' power cord to plug into a standard grounded 120 V AC outlet.
 5. A 20' control cable to connect to the control receptacle junction box.
 6. A practice timer mode
 7. Can sound the horn at the end of each segment
 8. Has 99 programmable segments
 9. Displays the segment number and segment length
 10. Has a programmable interval time
- G. Optional Equipment
1. Hard carrying case
 2. 2.4 GHz spread spectrum radio transmitter

3. Battery pack

2.06 SUPPORT POSTS

- A. Support Posts shall be galvanized steel ASTM A36 as shown on the plans and in accordance with Section 051200 – Structural Steel Framing.
- B. Support posts shall be primed and painted black, two (2) coats.

2.07 CONCRETE

- A. Concrete for footings shall be 4,500 psi minimum and be placed in accordance with Section 033000 – Cast-in-Place Concrete.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Verify exact scoreboard and control center quantities and junction box locations with Architect.
- B. Coordinate requirements for electrical power, concrete, steel erection, auxiliary framing and supports, suspension cables, and other components to be provided under other Specification Sections to ensure adequate provisions are made for complete, functional installation of scoreboards.
- C. Coordinate scoreboard electrical requirements to ensure proper power source, conduit, wiring, and boxes are provided. Prior to installation, verify type and location of power supply.

3.02 INSTALLATION

- A. Install scoreboards and accessories in accordance with manufacturer's instructions and approved installation drawings.
- B. Before installation, field test scoreboards and accessories for operating functions. Ensure that scoreboards accurately perform all operations. Correct deficiencies.
- C. Rigidly mount scoreboards and accessories level and plumb with brackets and fasteners.
- D. Clean exposed surfaces.
- E. Protect scoreboards and finishes from other construction operations.
- F. Paint all support posts in accordance with paint manufacturers specifications.

3.03 DEMONSTRATION AND TRAINING

- A. Provide demonstration and training session for Owner's representative covering operation and maintenance of electronic scoreboard.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 260500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes general, procedural, and administrative requirements, for electrical products, equipment, and installation practices applicable to this Division.

1.02 RELATED DOCUMENTS

- A. All Contract drawings, Contract General and Supplementary Conditions, Division 01 Specification Sections, and Bidding Requirements apply to this section.
- B. The requirements of this section shall apply to all other sections of Division 26.
- C. The general electrical requirements of this division shall also apply to:
 - 1. Division 23 – Heating, Ventilating and Air Conditioning
 - 2. Division 27 – Communications
 - 3. Division 28 – Electronic Safety and Security

1.03 SCOPE OF WORK

- A. It is the declared intent of the project drawings and these specifications that the contractor shall provide for the complete installation of operational electrical circuits and systems as outlined in the project documents.
- B. The Electrical Contractor shall provide all materials, equipment, labor, transportation, storage, etc., as necessary for, and incidental to, the completion of all electrical work as indicated on the Drawings and in these Specifications.
- C. Included in the above is all related electrical demolition activities, temporary electrical facilities to support the work, final testing, adjusting training as applicable.
- D. Before submitting his proposal, the Electrical Contractor shall be fully informed to the extent, character, and intent of the work to be done by him. No consideration will be granted for any misunderstanding of the material to be furnished or work to be performed.

1.04 USE AND INTERPRETATION OF DRAWINGS

- A. The drawings are intended to be diagrammatic in nature and are for general electrical design and arrangement of circuits and components. Drawings do not detail every component of the electrical work, nor do they detail complete routing paths. Unless otherwise noted, the locations and elevations of electrical system components are approximate. Exact final locations are subject to the approval of the Owner's Representative. Additional minor adjustments may also be required to avoid conflicts with furniture or other obstructions or field conditions. Similarly, the routing of services, feeders, branch circuits, system wiring, as indicated on the drawings, is not intended to be the exact routing. Verify routing with Owner's Representative.
- B. Unless specifically noted otherwise, branch circuit designations, i.e. "home run" designations, are for grouping purposes only to indicate the panelboard or interconnection box from which the branch circuit is served. Actual panel pole circuit numbers are to be determined in the field.

- C. Drawings do not show all offsets, fittings, supports, pull or splice interferences, and elevation changes. Adjust installation of conduit, equipment location, etc. to accommodate work with the obstacles and interferences. Where a major and important rearrangement is necessary, report same to Architect for review. Obtain written approval for all major changes.
- D. Cooperate with all other Contractors and Owners and determine the exact route of all raceways and location of all equipment the Drawings are diagrammatic and indicate the general arrangement of systems and equipment unless indicated otherwise by dimensions or details. Install work substantially as indicated. Exact equipment locations and raceway routing, etc. shall be governed by actual field conditions and/or instructions of the Engineer and/or Owner's Representative.
- E. During the course of the work, should any ambiguities or discrepancies be found on the drawings or in the specifications, to which the Contractor has failed call attention before submission of his bid, then the Engineer shall interpret the intent of the drawings and specifications, and the Contractor hereby agrees to abide by the Engineer's interpretation and agrees to carry out the work in accordance with the decision of the Engineer. It is expressly stipulated that neither the drawings nor the specifications shall take precedence, one over the other, with the exception the more stringent requirement shall prevail, and it is further stipulated that the Engineer may interpret or construe the drawings and specifications of the work, and of that question, the Engineer shall be the sole judge.

1.05 COMPLETE SYSTEMS

- A. The drawings and specifications are intended to provide for a complete, operational electrical installation. However, both the drawings and specifications are for the Electrical Contractor's guidance and are in no way intended to give every detail of the existing conditions or new installations, nor do they describe every fitting required for the installation of the work. The Electrical Contractor shall furnish, install, and place in workmanlike manner all equipment, accessories, supports, fittings, backboxes and all other material needed for a complete electrical and operational installation. The Electrical Contractor shall make all final connections to equipment. The Electrical Contractor shall prepare such additional drawings as necessary or required for any purpose and shall submit them for the approval of the Engineer.

1.06 APPLICABLE CODES, STANDARDS AND REGULATIONS

- A. Comply with NFPA 70 (National Electrical Code (NEC)), version currently adopted by the Authority Having Jurisdiction (AHJ). Comply with NECA (National Electrical Contractor's Association) Standards for minimum professional installation methods and practices. Comply with all applicable federal, state and local laws, ordinances, codes, rules and regulations. Where the Contract Documents exceed these requirements, the Contract Documents shall govern. In no case shall work be installed contrary to or below minimum legal standards. Comply with local authorities having jurisdiction (AHJ) and resolve any conflicts. Where conflicts between codes and standards arise, the more stringent requirements shall be adhered to.
- B. The current applicable rules, restrictions and requirements of the utility companies providing service to the project site/facilities shall be adhered to. Provide all required coordination.
- C. Should any materials installed, or work performed, be found to be not in compliance with any of the listed codes and regulations, provide all materials, labor, and pay all costs necessary to correct the deficiencies at no additional cost.

1.07 REFERENCE CODES & STANDARDS

- A. All work shall be in accordance with:

1. New York State Uniform Fire and Prevention Codes and Supplements (latest editions in effect at time of bid):
 - a. New York State Building Code
 - b. New York State Existing Building Code
 - c. New York State Energy Conservation Code
 - d. New York State Fire Code

2. The latest editions at time of bid (unless otherwise noted) of the below standards of the following:
 - a. ADA Americans with Disabilities Act
 - b. ASA American Standards Association
 - c. ASTM American Society for Testing Materials
 - d. ETL Electrical Testing Laboratories, Inc
 - e. IES Illuminating Engineering Society of North America.
 - f. IEEE Institute of Electrical and Electronic Engineers
 - g. IPCEA Insulated Power Cable for Engineers Association
 - h. OSHA Occupational Safety and Health Act
 - i. NEC National Electric Code (2017)
 - j. NECA National Electrical Contractor's Association
 - k. NEMA National Electrical Manufacturers Association
 - l. NESC National Electrical Safety Code
 - m. NFPA National Fire Protection Association
 - n. UL Underwriter's Laboratories

3. Listings: All equipment, materials and devices shall be listed and labelled by a Nationally recognized Testing Laboratory (NRTL), such as Underwriters Laboratories, Inc (UL) for the intended use and shall bear its label.

4. The Rules and Regulations of the local utilities providing service to the project location.

5. The Rules and Regulations of the local Authority Having Jurisdiction (AHJ).

6. The Directives of the Owner of the Facility where the work is being performed.

- B. Before submitting his bid, the Electrical Contractor shall be familiar with the rules of the aforementioned Boards, Departments, Agencies, etc. having jurisdiction, applicable Codes. and shall notify the Engineer with his bid, if in his opinion any work or materials specified is contrary to any such rules. Otherwise, the Electrical Contractor shall be responsible for the approval of all work or materials and in case the use of any material specified is not permitted, a substitute approved by the authorities and by the Engineer shall be furnished and installed without additional cost to the Owner.

1.08 DEFINITIONS

As Specified	All materials, equipment including the execution thereof as called for/shown in the Contract Documents.
Code Requirements	Minimum requirements necessary for compliance with applicable codes.
Concealed	Work not readily visible, including, but not limited to that which is inside walls, above ceilings, below or within slabs, below grade, within pipe and duct shafts chases or recesses.
Exposed	Work readily visible, including, but not limited to, that which is installed on wall/ceiling surfaces, below ceilings, etc. or otherwise not concealed.

Acceptance	Owner acceptance of the project from Contractor upon certification by Owner's Representative.
Furnished by Others	Materials, equipment provided by others received and/or installed by the Electrical Contractor. It includes receiving delivery at job site.
Inspection	Visual observations by Owner, his Site Representative, Architect/Engineer, or another Agency.
Install	All labor and materials necessary, and incidental to, the mount or place equipment, etc., completely connect and make operational.
Labeled	Classification by a standards agency.
Provide	Furnish and install complete and operational.
Relocate	Disconnect, disassemble, and transport equipment to new locations, then clean, install and test and make ready for use. All necessary wiring and raceway extensions shall be considered incidental to the relocation process.
Remove	Disconnect, disassemble, dismount and dispose of off-site, including all associated appurtenances, wiring and raceway rendered unnecessary by the removal.
Reinstall	All labor and materials necessary, and incidental to, mount or place previously removed equipment at or near its pre-existing location. Clean completely connect and make operational. Includes minor wiring rework necessary.
Remove	Disconnect, disassemble and dispose. Includes demolition of associated wiring and conduit rendered unnecessary by removal of subject item.
Replace	Remove and provide new item.
Review	A general contractual conformance check of specified products.
Roughing	Conduit, backboxes etc. pursuant to equipment layout and installation.
Safe Off	De-energize, disconnect and make safe for removal or other work in the area by the Electrical Contractor or by Others.
Satisfactory	In conformance with and as specified in Contract Documents.
Site Representative	Owner's designated Construction Manager or Inspector at the work site.

1.09 EXISTING CONDITIONS

- A. The Electrical Contractor, before submitting his bid, shall examine the site to which this work is in any way dependent upon according to the intent of these specifications and accompanying drawings. He shall report to the Architect/Engineer, in writing, prior to bid, any conditions which prevent him from performing his work. No "Waiver of Responsibility" for inadequate, incomplete, or defective work will be considered by the Engineer unless written notice had been filed by the Electrical Contractor with his bid.
- B. Where existing electrical systems of any voltage or purpose, or portions thereof, are to be re-used or modified, the Electrical Contractor shall test the affected portions for the purpose of identifying

pre-existing operational deficiencies. This shall include, but is not limited to, fire alarm, public address, security, CCTV, etc. Report any deficiencies, in writing, to the Owner or his designated representative. Deficiencies occurring after testing, not previously identified, shall be considered as a result of Contractor activities and shall be restored to working condition at no additional cost. If the Owner requests any of the pre-existing deficiencies be corrected by the Contractor, these shall be addressed at additional contract cost.

1.10 PERMITS, INSPECTIONS AND CERTIFICATES

- A. The Electrical Contractor shall procure and pay for all necessary drawings, permits, inspections and certificates required by the various governing agencies, etc. having jurisdiction or utilities providing service as part of the bid and shall turn over to the Engineer all permits for construction before starting work and certificates of test, inspection, and approval before requesting payment.
- B. Included in the above, the Electrical Contractor shall obtain a Certificate of Electrical Inspection for completed work from an approved third-party electrical inspection agency serving the project locale.

1.11 QUALITY ASSURANCE

- A. The Electrical Contractor shall be regularly engaged in the production or installation of specified products, and systems for not less than three years.
- B. All work under this Division shall be performed by a licensed electrician or done so under his direct supervision.
- C. All painting, patching, concrete work, carpentry, welding, core drilling, etc. incidental to the completion of Division 26 work shall be performed by skilled tradespersons appropriate to the work.

1.12 SUBMITTALS

- A. Within 30 days of the signing of the contract, prepare and submit for approval, per the procedures set forth in Division 01, all submittals required by Division 01, this Division and by all other Contract Documents.
- B. Required submittals may include, but not be limited to: Schedule of Values; Subcontractor List(s); Product Data; Shop Drawings; Test Reports; Calculations, Photometric Analysis, Certifications; Warranties; Operation & Maintenance Manuals; Record Drawings and various administrative submittals. Provide samples or mock-ups upon request at no additional cost.
- C. The number of copies submitted shall be as indicated in Division 01, or elsewhere in the Specifications or Contract Drawings. Electronic (.pdf or similar) may be submitted in lieu of hardcopies where permitted. Generally, all equipment and materials of the same classification, type or kind shall be submitted at one time.
- D. For materials, devices, equipment, etc. to be installed, as required in subsequent individual Division 26 sections, submit product data consisting of manufacturer's standard catalog cuts, descriptive literature and/or diagrams, etc. Submittals shall be provided in sufficient detail so as to clearly indicate compliance with all specified requirements and standards. Documents shall be clearly marked to indicate proposed product, selected options, selected accessories, selected finishes, etc. Please clearly indicate any equipment tags for each item as indicated on Drawings for correlation.
- E. For systems and equipment, as required in subsequent individual Divisions 26 sections provide project specific Shop Drawings which shall include all information listed in the Shop Drawings submittal requirements in the respective specification section. Include all pertinent information including, but not limited to, equipment/system identification, manufacturer/model, nameplate data,

dimensions, sizes, capacities, types, material, accessories and options, etc. Include any relevant performance data, system risers, wiring diagrams, etc. The documents provided shall be in sufficient detail so as to clearly indicate compliance with all project requirements and standards.

- F. Any construction delays caused by failure to submit shop drawings on time or in the proper format shall be the responsibility of the Electrical Contractor.
- G. Substitutions: Where products or materials are specified hereinafter by manufacturer's name and/or model number, they shall be considered as the standard and as most satisfactory for their purpose of use on the site or in the building. Another manufacturer's product other than those indicated may be submitted in lieu of the specified product with the understanding that the Engineer shall be the sole judge as to the equality to the specified item and acceptability of the submitted items. In addition, furnish to the Engineer or Owner upon request, and within 14 days of such a request, samples of any Base Bid and/or corresponding Alternate Bid item and/or intended substitute equipment, fixtures, etc. for their comparison and selection. Furnish any additional requested product information, calculations, etc. at no additional cost. Submission of substituted items is with the understanding that neither the Engineer nor the Owner is responsible for any delays or additional costs arising from review, acceptance, denial of said substituted item. Furthermore, any additional costs in material, labor, etc. or delays relating to the installation of substituted item shall be at no additional cost to the Engineer or Owner.

1.13 GUARANTEE

- A. For guarantee requirements, refer to the applicable section of the Conditions of the Contract.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Except where existing materials and equipment are called for to be reused, all materials and equipment furnished and installed under Division 26 shall be new, of standard first grade quality, undamaged, defect-free, and correctly designed for their specific purpose. All new materials and equipment shall conform to the standards of and be listed/labeled by a Nationally Recognized Testing Laboratory (NRTL) such as Underwriters Laboratories (UL) and shall be approved for use by all local authorities having jurisdiction.
- B. All equipment and material furnished shall be the manufacturer's standard item of production unless specifically specified or required to be modified to suit job conditions. Size, material; finish dimensions, and the capacities for the specified application shall be published in catalogs for national distribution by the manufacturer. Ratings and capacities shall be certified by a nationally recognized rating bureau.
- C. Where specific devices, equipment, systems (or portions thereof) are indicated to be re-used, the Electrical Contractor, in the presence the Owner or his representative, shall verify proper operation of same prior to commencing work. Report any pre-existing defects or non-functioning items to the Engineer/Architect. The Electrical Contractor shall be held responsible for correcting and/or replacing any unreported items found to be defective up until Owner Acceptance at no additional cost.
- D. Equipment and material fabricated specifically for use on this project shall be in strict accordance with the Drawings and Specifications and shall conform to the latest standards of the National Electric Manufacturer's Association.
- E. All materials and equipment of one and the same kind, type, or classification and used for identical purpose shall be made by the same manufacturer.

PART 3 – EXECUTION

3.01 GENERAL

- A. The electrical installation work shall be in accordance with the intent of the Contract Documents, and applicable Codes and Standards, and manufacturer' as determined by the Engineer.
- B. All materials and equipment shall be installed as in accordance with manufacturer's instructions, by mechanics experienced and skilled in their trade, in a neat and professional manner, in accordance with trade standards, and so as not to void any warranty or UL listing.
- C. Any workmanship considered by the Architect/Engineer as being faulty or substandard shall be removed and replaced by the Contractor to the satisfaction of the Architect/Engineer at no additional cost to the Owner.
- D. All work under the electrical contract shall be performed under the Contractor's direct supervision. Provide sufficient and qualified personnel necessary to complete the work in accordance with the Contract Documents and in accordance with the project schedule.
- E. Prior to installation, examine the areas and conditions under which the work is to be performed. Identify any conditions which will impact the proper and timely completion of the work. Do not proceed until the impacting conditions have been corrected.
- F. Install electrical raceways, wiring and systems parallel and perpendicular to building surfaces and components to the extent possible. Equipment, boxes, etc. shall be installed level and plumb.
- G. In general, run branch circuits in concealed above dropped ceilings, in furred walls, in voids and chases. All devices, conduits, wiring and conduits shall be recessed in new construction. In existing unfinished areas, such as mechanical spaces and storage areas wiring may be run exposed. In existing finished and public spaces where wiring cannot be practically concealed, such as block surfaces, wiring may be run in finished surface raceways secured using mechanically fastened clips.
- H. Unless otherwise indicated, provide final connections to all equipment, in accordance with manufacturer's instructions.

3.02 SAFE WORK PRACTICES

- A. To the greatest extent possible, all electrical work shall be performed on de-energized material and equipment using appropriate lock-out/tag-out procedures per OSHA requirements.
- B. Work on energized systems shall be approved by the Owner's representative. All persons working on energized equipment shall wear appropriate personal protective equipment (PPE) following safe work practices and the latest version of NFPA 70E. A minimum of two people is required to be working to ensure the safety of each.

3.03 DELIVERY, STORAGE AND HANDLING OF MATERIALS

- A. Comply with Division 01 requirements.
- B. The Contractor shall arrange with the Owner for storage of delivered materials related to the work. Where the Owner cannot provide safe, adequate, or sufficient space, provide off-site storage or, with owner approval, arrange and pay for sufficient secure on-site storage container(s). Locations of storage containers shall be coordinated with the Owner.

- C. The Electrical Contractor shall be responsible for coordinating, off-loading, receiving and storing all deliveries related to the work. Coordinate all haul routes and schedules with the Owner or Construction Manager.
- D. Products shall be delivered in manufacturer's original unopened packaging, with manufacturer's identification and product labelling.
- E. Products shall be stored in a manner which shall protect them from theft, damage, weather and entry of debris. Comply with all manufacturer's written storage recommendations.
- F. Promptly inspect delivered goods for damage and deficiencies. Arrange for their prompt replacement or removal from the site. Do not install damaged products.

3.04 COORDINATION AND COOPERATION

- A. The work called for in the Contract Drawings Specifications shall be carried on in conjunction with the continued operation of the building. The work shall be arranged such that its installation and operation will conform with and facilitate the early installation of the work.
- B. The Electrical Contractor shall bear the expense required to revise his work due to any failure to coordinate the installation of his work with that of the building's operation.
- C. Unless otherwise stated in the Contract Drawings, all outages to building systems will occur when the building is not in use. The Electrical Contractor shall include all premium time charges in the bid.
- D. The Electrical Contractor shall be responsible for the distribution and information concerning his work as required for the prompt installation. The Electrical Contractor will be held fully responsible for any delay in the work resulting from failure to distribute any information, etc. regarding his work as required. See also the applicable sections of the Conditions of the Contract.
- E. The Electrical Contractor shall coordinate and cooperate with the Contractors of other trades, Subcontractors, outside agencies, and with the Owner regarding placement, anchorage and accomplishment of the work. Resolve interferences between work of other disciplines or Contractors, prior to commencing installation.
- F. Coordinate with other trades for all demolition activities. Provide mark-outs for items to be demolished by others. De-energize and safe off circuits in demolition areas as required for a safe work area.
- G. Coordinate with other trades and with Owner for chases, slots and openings during the project as required to complete the installation of the electrical work in timely manner.
- H. Coordinate with other trades in scheduling all installation activities with the overall goal of completion of the project in a timely manner.
- I. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- J. During the installation of equipment and raceways, provide any offsets, fittings, boxes, accessories to achieve changes in elevation or location as necessary to avoid obstacles and interferences, per actual field conditions.
- K. Piping or other systems which are dependent upon slope have the right of way.

- L. Provide temporary dust caps on smoke detectors in the work area as necessary to prevent false alarms. Remove when no longer required.

3.05 SHUTDOWNS

- A. All shutdowns to existing electrical services are to be scheduled and approved, in advance, in writing, by the Owner. Unless otherwise noted, assume all temporary shutdowns to be performed while the building is not in operation. Include all premium time in bid. Include any applicable utility shutdown fees in bid.

3.06 DIMENSIONING

- A. Refer to architectural or other dimensioned drawings. However, field measurements take precedence over dimensioned drawings. Do not scale drawings.

3.07 PROTECTION OF THE WORK

- A. The Electrical Contractor shall effectively protect, at his expense, all materials and equipment, including his employees and building occupants, during the period of construction and shall be held responsible for all damage done to his work, until the same is fully accepted by the Architect. See also the applicable sections of the Conditions of the Contractor. Protect all electrical materials, equipment and work from the vandalism, weather elements, theft, paint overspray, concrete and mortar, construction debris and damage, etc. until acceptance by the Owner. Repair, replace and clean all electrical work so affected at no additional cost to the Contract.

3.08 CUTTING AND PATCHING

- A. All cutting, core drilling, etc. required to facilitate the proper installation of all work to be installed under Electrical is the responsibility of the Electrical Contractor, unless indicated otherwise. All cutting shall be done in the manner specified and/or directed and approved by the Engineer and only after permission of the Engineer is obtained. The installation of sleeves, chases, etc. in concrete walls, floors, ceilings, and roofs as well as the cutting of existing concrete walls, floors, ceilings, and roofs shall be done by core drilling. All patching will be the responsibility of this Contractor.
- B. All penetrations to exterior walls and below grade foundations shall be made through sleeves provided by the Electrical Contractor and thoroughly sealed and caulked airtight and watertight.
- C. Roof penetrations shall be performed via approved roof curbs, pitch pockets, pipe portals etc. Unless otherwise indicated, provide all required materials and labor to perform the penetration and subsequent repair. All penetrations shall be repaired and sealed airtight and watertight in accordance with existing roof warranties and roof manufacturer directions. In no case shall any roof penetration or repairs violate existing warranties.
- D. Provide all new patching work to match existing conditions.

3.09 WATERPROOFING

- A. Wherever any of the work of Division 26 must pierce any waterproofing, this work shall be done by the Electrical Contractor with care. After the part of these systems have been put in place through this waterproofing, the opening made by same shall be waterproofed and made absolutely watertight as approved by the Architect and/or as hereinafter specified.
- B. Conduits piercing the cement waterproofing of walls and floors shall be provided with waterproof conduit entrance seal sleeves around same. These sleeves shall be Type "WSK" (walls) or "FSK" (floors) as manufactured by O-Z or other approved.

- C. Conduit sleeves through non-waterproofed, non-fire-rated walls and floors shall be grouted, caulked with oakum, and sealed with approved semi-plastic mastic compound on both sides of the wall.
- D. All roof penetrations shall be performed in a manner to obtain watertight seal and in conformance with existing roof warranties. Unless provided by others, provide pitch pockets, pipe portals or other means consistent with existing roof warranties for any roof penetrations. Coordinate penetrations for rooftop HVAC equipment with the Mechanical Contractor.

3.10 FIRESTOPPING

- A. Provide and apply listed firestopping materials to penetrations of fire-rated floor and wall assemblies for electrical installation. Firestopping shall restore original fire-resistance rating of assembly or better. Firestopping materials and installation requirements are specified in Section 078413 – Penetration Firestopping.

3.11 CEILING REMOVALS

- A. Unless otherwise noted in the contract Documents, existing ceilings which must be removed for the Electrical Contractor's installation or demolition work shall be done by the Electrical Contractor. No ceiling shall be removed without prior approval of the Owner. When directed by the Owner or Owner's Representative, removed ceilings shall be restored at the end of each working day. Ceilings which must be removed shall be restored to their original condition as soon as practical and prior to final payment.
- B. Store any removed ceiling tiles either in the ceiling space or at a designated space in the building until re-installation.
- C. Take all necessary precautions to prevent damage to the existing ceilings.
- D. Replace Contractor damaged ceiling tiles with new ceiling construction to match the existing and to the Owner's satisfaction.
- E. Coordinate with other trades when ceiling related work must be performed in common work areas.
- F. In areas with pre-existing ceiling damage, coordinate with the Owner's representative to document said damage, and determine if the Owner wishes to provide replacement ceiling materials for re-installation.

3.12 PHASE ROTATIONS

- A. The Electrical contractor is responsible to verify and maintain facility phase rotations throughout.

3.13 PAINTING AND FINISHING

- A. Where final painting and finishes are not being provided by other trades, provide all priming and painting to cuts and patches performed under this Contract in finished areas to match existing conditions.
- B. Provide matching painting and patching for surfaces in finished areas at locations of Electrical demolition and/or removals.
- C. Provide matching painting and patching to building surfaces damaged as result of Electrical installation work.
- D. Provide touch up painting to equipment furnished under this contract.

- E. All painting materials shall conform to paint specifications elsewhere in the Contract Documents, or in the absence of same, shall be suitable for the surfaces and environments used. In no case shall lead based paints be used.

3.14 CHECKOUT, TESTING AND ADJUSTING

- A. Provide all required programming, integration and adjustments, tune-ups. etc. as required to bring the equipment or system up to fully operational condition.
- B. All tests required by the National Electrical Code, approved Electrical Inspection Agencies, State and Local Authorities, the servicing Utility Company, and the Engineer shall be executed by or paid for by the Electrical Contractor. Furnish all labor, material, and instruments for each test. All major tests shall be witnessed by the Engineer. Owner's representative and/or the Authority having jurisdiction, all of whom shall be given a minimum of one week's written notice prior to such tests.
- C. Tests shall be scheduled at least one week in advance and at a time so as not to disrupt building operation, and to allow Engineer and Owner representative(s) the opportunity to witness the test, unless directed otherwise. Tests shall not be scheduled until the system installation is complete and fully operational, unless indicated or otherwise directed.
- D. Where required by subsequent specification sections or by the manufacturer, arrange for and pay all costs for manufacturer's authorized representative(s) to be present at time of system or equipment start-up. The manufacturer's representative shall provide system integration and programming, start-up supervision, conduct and/or certify all required testing and adjusting, and provide any required training to the end user.
- E. Coordinate with the Owner or his designated representative where Owner preferences or input is required for system setup.
- F. Submit test reports neatly typewritten on 8-1/2 x 11" sheets indicating system or equipment being tested, date, and time of test, testing methodology, witnesses, testing results and any other pertinent information. Within five (5) days of test completion, submit written or electronic (PDF) copy of test reports for Engineer review, and include a copy with the appropriate operation and maintenance data.
- G. At no additional cost, the Electrical Contractor shall correct any deficiencies found, and replace any defective materials and equipment or unable to perform at design or rated capacity. Repeat testing without additional cost to the Owner or Contract until satisfactory results are achieved. Submit final report indicating any corrective measures taken and satisfactory test results.

3.15 FINAL INSPECTIONS

- A. Coordinate and obtain all final inspections as required by these specifications and as required by the Authority Having Jurisdiction. Obtain electrical inspection certificate from an authorized Electrical Inspection Agency. Include all costs in bid. Provide all inspection reports and Inspection certificates as part of closeout documents.

3.16 SYSTEMS DEMONSTRATION

- A. The Electrical Contractor shall be fully responsible for instructing the Owner's designated personnel in the operation and maintenance of all equipment and systems furnished under the Contract. All costs required for such instruction and demonstration shall be paid for by the Electrical Contractor. Such instruction shall take place in the presence of the Owner's representative upon completion of the work. The Owner reserve the right to record any training sessions. Furnish for Owner use, Engineer approved, printed and bound copies of all operation and maintenance construction

manuals. Included in these manuals shall be one (1) copy of all previously submitted and Engineer "Approved" or "Approved as Noted" shop drawings ("Approved as Noted" shop drawings must first be permanently corrected). Informal or non-Engineer witnessed instructions or instructions to non-designed Owner personnel shall not be recognized as fulfilling these requirements.

3.17 CLEANING

- A. Perform cleaning in accordance with Division 01.
- B. Maintain a clean work site. Remove from the premises, all packaging / shipping materials, waste, rubbish and construction debris. The premises shall be left clean and free of any debris and unused construction materials prior to final acceptance. Leave the area broom clean.
- C. Clean all electrical equipment enclosures of dirt, dust, wire cuttings and other foreign materials.
- D. Clean all light fixtures, lenses, reflectors and lamps of dirt, dust, fingermarks etc. Adjust lenses for proper fit.
- E. Remove all temporary dust caps from fire alarm devices.
- F. Provide touch-up painting to restore and refinish to match original condition surfaces of electrical equipment scratched, marred during shipping, handling or installation. Remove any rust and prime and paint as recommended by manufacturer. Pay particular attention to equipment installed outdoors in areas of harsh environment.

3.18 RECORD DOCUMENTS

- A. Prior to final payment, submit Close Out Documentation in accordance with Division 01.
- B. As-Built record drawings shall document installed locations of equipment, panelboards, disconnect switches and control devices. Document the approximate as-built routing of major feeders and underground conduit runs.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 260519 – LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 – GENERAL

1.01 SUBMITTALS

- A. Product Data: Manufacturer's standard catalog sheets, specifications, and installation instructions.

1.02 QUALITY ASSURANCE

- A. Electrical components, conductors, devices and accessories described herein shall be listed and labeled as defined by NFPA 70 by a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories (UL), for the intended use and shall bear its label.

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: General Cable Corporation., Cerro Wire & Cable Co. Inc., Prysmian Cables & Systems, or Southwire Co or equal.
- 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. 8 and larger shall be stranded. Conductors No. 10 and smaller shall be solid.
- D. Types:
 - 1. Electric Light and Power Wiring:
 - a. Minimum conductor size is No. 12 AWG, unless indicated otherwise.
 - b. General: Rated 600V, NFPA 70 Type THHN/THWN-2 or XHHW-2.
 - c. THHN/THWN-2 Gasoline and Oil Resistant: Polyvinylchloride insulation rated 600 V with nylon jacket conforming to UL requirements for type THHN/THWN-2 insulation, with the words "GASOLINE AND OIL RESISTANT II" marked thereon.
 - d. USE-2: Dual rated heat and moisture resistant insulation rated 600 V with jacket or dual-purpose insulation/protective covering conforming to UL requirements for type USE-2 service entrance cables.
 - e. Metal-Clad Cable, NFPA 70 Article 330 Type MC:
 - 1) Interlocked flexible galvanized steel armor sheath, conforming to UL requirements for type MC metal clad cable. Aluminum armored type MC cable is NOT permitted.
 - 2) Insulated copper conductors, suitable for 600 volts, rated 90°C, one of the types listed in NFPA 70 Table 310.13(A) or of a type identified for use in Type MC cable.
 - 3) Internal full size copper ground conductor with green insulation.
 - 4) Acceptable Companies: AFC Cable Systems Inc., Southwire, General Cable.
 - 5) Connectors for MC cable: AFC Fitting Inc.'s AFC Series, Arlington Industries Inc.'s Saddle grip, or Thomas & Betts Co.'s Tite-Bite with anti-short bushings.

- f. MI: AFC Cable Systems' Type MI Cable, or Pentair Pyrotenax Mineral Insulated System 1850 Pyrotenax Cable:
 - 1) Copper conductors.
 - 2) Seamless copper sheath.
 - 3) Two hour fire resistive rating UL system classified, listed in UL Building Materials Directory product category Electrical circuit Protective Systems (FHIT), or Fire Resistive Cables (FHJR).
 - 4) Fittings and accessories as required for a complete system to suit listing and installation conditions.
- 2. Class 1 Wiring:
 - a. No. 18 and No. 16 AWG: Insulated copper conductors suitable for 600 volts, NFPA 70 types KF-2, KFF-2, PAFF, PF, PFF, PGF, PGFF, PTF, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, or ZFF.
 - b. Larger than No. 16 AWG: Insulated copper conductors suitable for 600 volts, in compliance with NFPA 70 Article 310.
 - c. Conductor with other types and thickness of insulation may be used if listed for Class 1 circuit use.
- 3. Class 2 Wiring:
 - a. Multiconductor Cables: NFPA 70 Article 725, Types CL2P, CL2R, CL2.
 - b. Other types of cables may be used in accordance with NFPA 70 Table 725.154(G) "Cable Substitutions", as approved.
- 4. Class 3 Wiring:
 - a. Single Conductors No. 18 and No. 16 AWG: Same as Class 1 No. 18 and No. 16 AWG conductors except that:
 - 1) Conductors are also listed as CL3.
 - 2) Voltage rating not marked on cable except where cable has multiple listings and voltage marking is required for one or more of the listings.
 - b. Multiconductor Cables: NFPA 70 Article 725, Types CL3P, CL3R, CL3.
 - c. Other types of cables may be used in accordance with NFPA 70, Table 725.154(G) "Cable Substitutions", as approved.

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 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).
- 3. Use of Split-Bolt type connectors is NOT permitted.

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 or equal.
 2. Indent Type with Insulating Jacket:
 - a. 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 STAKON.
 3. Indent Type (Uninsulated): Anderson/Hubbell's Versa-Crimp or equal, VERSAtile, Blackburn/T&B Corp.'s Color-Coded Compression Connectors, Electrical Products Div./3M's Scotchlok 10000, 11000 Series, Burndy's Hydent, Penn-Union Corp.'s BCU, BBCU Series, or Thomas & Betts Corp.'s Compression Connectors or equal.
 4. Connector Blocks: NIS Industries Inc.'s Polaris System, or Thomas & Betts Corp.'s Blackburn AMT Series or equal.
 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 or equal.
 6. Heat Shrinkable Splices: Electrical Products Div./3M's ITCSN, Raychem Corp.'s Thermofit Type WCS, or Thomas & Betts Corp.'s SHRINK-KON Insulators or equal.
 7. Cold Shrink Splices: Electrical Products Div./3M's 8420 Series or equal.
- 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, Burndy's Polytap KPU-AC, H-Crimpfit 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 or equal.
- D. Terminals: Nylon insulated pressure terminal connectors by Amp-Tyco/Electronics, Electrical Products Div./3M, Burndy, Ideal Industries Inc., Panduit Corp., Penn-Union Corp., Thomas & Betts Corp., or Wiremold Co. or equal
- E. Lugs:
1. Single Cable (Compression Type Lugs): Copper, one- or 2-hole style (to suit conditions), long barrel; Anderson/Hubbell's VERSAtile VHCL, Blackburn/T&B Corp.'s Color-Coded CTL, LCN, 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 or equal.
 2. Single Cable (Mechanical Type Lugs): Copper, one- or 2-hole style (to suit conditions); Blackburn/T&B Corp.'s Color-Keyed Locktite Series, 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 or equal.

3. Multiple Cable (Mechanical Type Lugs): Copper, configuration to suit conditions; 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 or equal.

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 or equal.
- B. Moisture Sealing Tape: Electrical Products Div./3M's Scotch 2200 or 2210, or Plymouth Rubber Co.'s Plymouth/Bishop 4000 Plyseal-V or equal.
- C. Electrical Filler Tape: Electrical Products Div./3M's Scotchfil, or Plymouth Rubber Co.'s Plymouth/Bishop 125 Electrical Filler Tape or equal.
- D. Color Coding Tape: Electrical Products Div./3M's Scotch 35, or Plymouth Rubber Co.'s Plymouth/Bishop Premium 37 Color Coding or equal.
- 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 or equal.

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, Cable Cream, Cable Gel, Winter Gel, Ideal Industries Inc.'s Yellow 77, Aqua-Gel II, Aqua-Gel CW, or Thomas & Betts Corp.'s Series 15-230 Cable Pulling Lubricants, or Series 15-631 Wire Slick or equal.

2.05 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.
- B. No grease, oil, or lubricant other than wire-pulling compounds specified may be used to facilitate the installation of conductors.

3.02 CIRCUITING

- A. Do not change, group, or combine circuits other than as indicated on the drawings.
- B. Do not change, group, or combine circuits other than as indicated on the drawings except as permitted under Section 260532 when reusing existing raceways.

3.03 SEPARATE NEUTRAL CONDUCTOR

- A. Provide a separate neutral conductor for each circuit. Use of common neutral for multiple circuits is NOT permitted.

3.04 CONDUCTOR SIZE

- A. Conductor Size:
 - 1. For Electric Light and Power Branch Circuits: Install conductors of size shown on drawings. Where size is not indicated, the minimum size allowed is No. 12 AWG.
 - 2. Light and Power homeruns shall be #12 AWG size, unless otherwise noted. Where Light and Power homeruns exceed 100 feet as measured to nearest outlet or switch to panelboard, the homerun shall be upsized to #10 AWG.
 - 3. For Class 1 Circuits:
 - a. No. 18 and No. 16 AWG may be used provided they supply loads that do not exceed 6 amps (No. 18 AWG), or 8 amps (No. 16 AWG).
 - b. Larger than No. 16 AWG: Use to supply loads not greater than the ampacities given in NFPA 70 Section 310.15.
 - 4. For Class 2 Circuits: Any size to suit application.
 - 5. For Class 3 Circuits: Minimum No. 18 AWG.

3.05 COLOR CODING

- A. General:
 - 1. Color coding for electric light and power conductors shall be by continuous colored insulation as described below.
 - 2. Large Conductors: Conductors of sizes No. 4 AWG and larger may be furnished with black insulation and color coded with Vinyl Color Coding Tape at all accessible points.
- B. Color Coding for 120/208 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.
- C. Color Coding For 277/480 Volt Electric Light and Power Wiring:
 1. Color Code:
 - a. 2 wire circuit – brown, gray.
 - b. 3 wire circuit – brown, yellow, gray.
 - c. 4 wire circuit – brown, yellow, orange, gray.
 2. Gray to be used only for an insulated grounded conductor (neutral). If neutral is not required use brown and yellow, or brown, yellow and orange for phase-to-phase circuits.
 - a. "Gray" For Sizes No. 6 AWG or Smaller.
 - 1) Continuous gray outer finish.
 - b. "Gray" For Sizes Larger Than No. 6 AWG:
 - 1) Distinctive gray markings (color coding tape) encircling the conductor, installed on the conductor at time of its installation. Install gray color-coding tape at terminations, and at 1' 0" intervals in gutters, pull boxes, and manholes.
 - c. Colors: (Brown, Yellow, Orange)
 - d. For Branch Circuits: Continuous color outer finish.
 - e. For Feeders:
 - 1) Continuous color outer finish, or:
 - 2) Color coding tapes encircling the conductors, installed on the conductors at the time of their installation. Install color coding tapes at terminations, and at 1' 0" intervals in gutters, pull boxes, and manholes.
- D. More Than One Nominal Voltage System Within A building: Permanently post the color-coding scheme at each branch-circuit panelboard.

- E. 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.
- F. Color Code for Wiring Other Than Electric Light and Power: In accordance with ICEA standard S-73-532 (NEMA WC57-2004). Other coding methods may be used, as approved.

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. Provide an equipment grounding conductor for all circuits. Raceways shall not be relied upon as an equipment grounding conductor.
 - 2. Where multiple circuits are grouped in a common raceway, a single equipment ground sized as per Code may be permitted.
 - 3. Equipment grounding conductor shall be sized in accordance with the Contract Drawings. Where no size is indicated, provide minimum size equipment ground required by the Code.
 - 4. Where conductors are upsized to account for voltage drop, the equipment grounding conductor shall be proportionally upsized per Code, whether or not indicated on the drawings.
- 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).
 - 3. "Green" For Sizes Larger Than No. 6:
 - a. Stripping the insulation or covering from the entire exposed length (see exception below).
 - b. Marking the exposed insulation or covering with green color-coding tapes.
 - c. Identify at each end and at every point where the equipment grounding conductor is accessible.

3.08 ARC PROOFING

- A. Where indicated on the drawings, arc proof feeders installed in a common pull box or manhole as follows:
 - 1. Arc proof new feeders.
 - 2. Arc proof existing feeders that are spliced to new feeders.
 - 3. Arc proof each feeder as a unit (except feeders consisting of multiple sets of conductors).

4. Arc proof feeders consisting of multiple sets of conductors by arc proofing each set of conductors as a unit.
5. Arc proof feeders 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.

3.09 INSULATED CONDUCTOR AND CABLE SCHEDULE - TYPES AND USE

A. Electric Light and Power Circuits:

1. Type THHN/THWN-2 or XHHW-2. : Wiring in dry or damp locations (except where special type insulation is required).
2. THHN/THWN-2, XHHW-2, or USE-2: Wiring in wet locations (except where type USE-2 insulated conductors are specifically required, or special type insulation is required).
3. THHN/THWN-2: Wiring installed in existing raceway systems (except where special type insulation is required).
4. THHN/THWN-2 or XHHW-2: Wiring for electric discharge lighting circuits (fluorescent, HID), except where fixture listing requires wiring rated higher than 90° C.
5. THHN/THWN-2 Marked "Gasoline and Oil Resistant": Wiring to gasoline and fuel oil pumps.
6. USE-2: Wiring indicated on the drawings to be direct burial in earth.
7. 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).
8. MC:
 - a. Use of MC cable may be used in lieu of individual conductors in conduit, subject to the provisions of the NFPA 70 where run concealed above suspended ceilings and stud walls
 - b. Branch circuit wiring in wood framed construction (wood joists and wood stud partitions):
 - 1) Install conductors parallel with joists or studs and attach to the side of these timbers by galvanized straps spaced not more than 6 feet apart.
 - 2) Install conductors through holes bored in the center of the timbers when running at right angles to joists or studs.
 - 3) Do not attach the conductors to the edge of joists or studs.
 - c. Branch circuit wiring in movable metal partitions and movable gypsum partitions.
 - 1) Install conductors in accordance with partition manufacturer's recommendations.
 - d. Branch circuit wiring in metal stud partitions:
 - 1) Install conductors parallel with studs and attach to the side by galvanized straps spaced not more than 6 feet apart.
 - 2) Install conductors through holes bored in the center of the metal member when running at right angles to studs.

- a) Conductors shall be protected by listed bushings or listed grommets covering all metal edges.
 - 3) Do not attach the conductors to the edge of studs.
 - e. Concealed Above Ceilings: Subject to the provisions of NFPA 70. Support MC cable from building structure. Mc cable shall not be permitted to be supported by the ceiling grid.
9. MI:
- a. Wiring for underplaster extensions.
 - b. Wiring in areas where indicated on drawings.
 - c. Where MI cable is installed in areas subjecting cable to corrosion, use PVC or HDPE jacketed MI cable (nonmetallic jacketed cable is not suitable for use in ducts, plenums or other spaces used for environmental air).

3.10 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 above ground 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.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 260526 – GROUNDING AND BONDING

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's standard catalog cuts for each type of product indicated.
- B. Product Data: For the following:
 - 1. Ground rods.
 - 2. Grounding clamps & connectors
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
- D. Field Test Reports: Submit written test reports to include the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.04 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a Nationally Recognized Testing Agency (NRTL) acceptable to authorities having jurisdiction and marked for intended use.
 - 1. Comply with UL 467.
 - 2. Comply with NFPA 70.
 - 3. For overhead-line construction and medium-voltage underground construction, comply with IEEE C2.
 - 4. Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Burndy Corp.
 - 2. Cadweld Div.; Erico Product, Inc.
 - 3. Erico International Corporation
 - 4. ILSCO
 - 5. Joslyn Corp.
 - 6. OZ Gedney Div.; General Signal Corp.
 - 7. Thomas and Betts Corp.
 - 8. Thompson Lightning Protection Corp.

2.02 GROUNDING CONDUCTORS

- A. Insulated conductors, comply with Section 260519.
- B. Material: Aluminum, copper-clad aluminum, and copper.
- C. Equipment Grounding Conductors: Insulated with green-colored insulation.
- D. Grounding Electrode Conductors: Stranded cable.
- E. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.
- F. Bare Copper Conductors: Comply with the following:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Assembly of Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
- G. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

2.03 CONNECTOR PRODUCTS

- A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.
- B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.
- C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

2.04 GROUNDING ELECTRODES

- A. Ground Rods: Pointed, Copper-clad steel.
 - 1. Size: 3/4 x 120 inches
- B. Test Wells: Where indicated, provide handhole as specified in Division 2 Section "Underground Ducts and Utility Structures."

PART 3 - EXECUTION

3.01 APPLICATION

- A. In raceways, use insulated equipment grounding conductors.
- B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.
- C. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.
- D. Ground Rod Clamps at Test Wells: Use bolted pressure clamps with at least two bolts.
- E. Underground Grounding Conductors: Use copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches (600 mm) below grade or bury 12 inches (300 mm) above duct bank when installed as part of the duct bank.

3.02 SERVICE GROUNDING

- A. Provide a grounding electrode conductor, sized in accordance with the drawings or NFPA 70, connected to the neutral bus at the service disconnecting means and the opposite end connected to a listed grounding electrode.
- B. Equipment grounding conductors shall be connected to the ground bus at the service disconnecting means.
- C. Comply with NEC and local utility grounding requirements.

3.03 SEPARATELY DERIVED SYSTEM GROUNDING

- A. Separately derived systems shall include, but are not limited to:
 - 1. Transformers (exception: autotransformers)
 - 2. Generators (where neutral is switched)
 - 3. UPS systems when so configured.
- B. Comply with NFPA 70.
- C. A grounding electrode conductor, sized per the drawings or NFPA 70, shall be provided between the separately derived system grounded conductor and grounded metal frame or metal structural member. This connection shall be made at the source grounded conductor bus or at the first disconnecting means subject to the provisions of NFPA 70.
- D. Provides system bonding jumper, sized per drawings or NFPA 70 between the system grounded conductor bus and the equipment ground bus.
- E. There shall be no further connections between the grounded conductor and equipment ground downstream (load side) of the connection.

3.04 EQUIPMENT GROUNDING CONDUCTORS

- A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

- B. Install equipment grounding conductors in all new feeders and branch circuits. Reliance solely on metallic raceways for equipment grounding means is NOT permitted.
- C. Computer Outlet Circuits: Install insulated equipment grounding conductor in branch-circuit runs from computer-area power panels or power-distribution units.
- D. Air-Duct Equipment Circuits: Install an equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners and heaters. Bond conductor to each unit and to air duct.
- E. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate equipment grounding conductor to each electric water heater, heat-tracing, and antifrost heating cable. Bond conductor to heater units, piping, connected equipment, and components.
- F. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
 - 1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6.4- by-50-by-300-mm) grounding bus.
 - 2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- G. Metal Poles Supporting Outdoor Lighting Fixtures: Provide a grounding electrode in addition to installing a separate equipment grounding conductor with supply branch-circuit conductors.

3.05 INSTALLATION

- A. Ground Rods: Install ground rods per NEC and utility requirements.
 - 1. Drive ground rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
 - 2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds. Make connections without exposing steel or damaging copper coating.
 - 3. Ground rods shall be installed in undisturbed earth.
- B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.
- D. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

- E. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding clamp connectors.
- F. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.
- G. Bond each aboveground portion of gas piping system upstream from equipment shutoff valve.
- H. Install one test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade or floor.

3.06 CONNECTIONS

- A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
- C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
- D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.
- E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and ground rods.
- F. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
- G. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.07 GRADING AND PLANTING

- A. Restore surface features, including vegetation, at areas disturbed by Work of this Section. Reestablish original grades, unless otherwise indicated. If sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include application of topsoil, fertilizer, lime, seed, sod, sprig, and mulch. Comply with Section 310000. Maintain restored surfaces. Restore disturbed paving as indicated.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 260529 – FASTENERS, ATTACHMENTS, AND SUPPORTING DEVICES

PART 1 – GENERAL

1.01 SUBMITTALS

- A. Product Data: Manufacturer's standard catalog sheets, specifications and installation instructions.
- B. Unless noted otherwise, specific manufacturer's and / or model / part numbers indicated in this specification section, shall be interpreted as that "manufacturer and/or model / part number" or equal.

PART 2 - PRODUCTS

2.01 ANCHORING DEVICES

- A. Sleeve Anchors: Molly/Emhart's Parasleeve Series, Phillips' Red Head AN, HN, FS Series, or Ramset's Dynabolt Series.
- B. Wedge Anchors: Hilti's Kwik Bolt Series, Molly/Emhart's Parabolt Series, Phillips' Red Head WS, or Ramset's Trubolt Series.
- C. Self-Drilling Anchors: Phillips' Red Head Series S or Ramset's Ram Drill Series.
- D. Non-Drilling Anchors: Hilti's Drop-In Anchor Series, Phillips' Red Head J Series, or Ramset's Dynaset Series.
- E. Stud Anchors: Phillips' Red Head JS Series.

2.02 CAST-IN-PLACE CONCRETE INSERTS

- A. Continuous Slotted Type Concrete Insert, Galvanized:
 - 1. Load Rating 1300 lbs./ft.: Kindorf's D-986.
 - 2. Load Rating 2400 lbs./ft.: Kindorf's D-980.
 - 3. Load Rating 3000 lbs./ft.: Hohmann & Barnard Inc.'s Type CS-H.
 - 4. Load Rating 4500 lbs./ft.: Hohmann & Barnard Inc.'s Type CS-HD.
- B. Threaded Type Concrete Insert: Galvanized ferrous castings, internally threaded.
- C. Wedge Type Concrete Insert: Galvanized box-type ferrous castings, designed to accept bolts having special wedge shaped heads.

2.03 MISCELLANEOUS FASTENERS

- A. Except where shown otherwise on the Drawings, furnish type, size, and grade required for proper installation of the Work, selected from the following: Furnish galvanized fasteners for exterior use, or for items anchored to exterior walls, except where stainless steel is indicated.
 - 1. Standard Bolts and Nuts: ASTM A 307, Grade A, regular hexagon head.
 - 2. Lag Screws: ASME B18.2.1.
 - 3. Machine Bolts: ASME B18.5 or ASME B18.9, Type, Class, and Form as required.

4. Wood Screws: Flat head, ASME B18.6.1.
5. Plain Washers: Round, ASME B18.22.1.
6. Lock Washers: Helical, spring type, ASME B18.21.1.
7. Toggle Bolts: Spring Wing Type; Wing AISI 1010, Trunion Nut AISI1010 or Zamac Alloy, Bolt Carbon Steel ANSI B18.6.3.

- B. Stainless Steel Fasteners: Type 302 for interior Work; Type 316 for exterior Work; Phillips head screws and bolts for exposed Work unless otherwise specified.

2.04 TPR (THE PEEL RIVET) FASTENERS

- A. 1/4 inch diameter, threadless fasteners distributed by Subcon Products, 315 Fairfield Road, Fairfield, NJ 07004 (800) 634-5979.

2.05 HANGER RODS

- A. Mild low carbon steel, unless otherwise specified; fully threaded or threaded each end, with nuts as required to position and lock rod in place. Unless galvanized or cadmium plated, provide a shop coat of red lead or zinc chromate primer paint.

2.06 "C" BEAM CLAMPS

- A. With Conduit Hangers:

1. For 1 Inch Conduit Maximum: B-Line Systems Inc.'s BG-8, BP-8 Series, Caddy/Erico Products Inc.'s BC-8P and BC-8PSM Series, or GB Electrical Inc.'s HIT 110-412 Series.
2. For 3 Inch Conduit Maximum: Appleton Electric Co.'s BH-500 Series beam clamp with H50W/B Series hangers, Kindorf's 500 Series beam clamp with 6HO-B Series hanger, or OZ/Gedney Co.'s IS-500 Series beam clamp with H-OWB Series hanger.
3. For 4 Inch Conduit Maximum: Kindorf's E-231 beam clamp and E-234 anchor clip and C-149 series lay-in hanger; Unistrut Corp.'s P2676 beam clamp and P-1659A Series anchor clip with J1205 Series lay in hanger.

- B. For Hanger Rods:

1. For 1/4 Inch Hanger Rods: B-Line Systems Inc.'s BC, Caddy/Erico Products Inc.'s BC, GB Electrical Inc.'s HIT 110, Kindorf's 500, 510, or Unistrut Corp.'s P1648S, P2398S, P2675, P2676.
2. For 3/8 Inch Hanger Rods: Caddy/Erico Products Inc.'s BC, Kindorf's 231-3/8, 502, or Unistrut Corp.'s P1649AS, P2401S, P2675, P2676.
3. For 1/2 Inch Rods: Appleton Electric Co. BH-500 Series, Kindorf's 500 Series, 231-1/2, OZ/Gedney Co.'s IS-500 Series, or Unistrut Corp.'s P1650AS, P2403S, P2676.
4. For 5/8 Inch Rods: Unistrut Corp.'s P1651AS beam clamp and P1656A Series anchor clip.
5. For 3/4 Inch Rods: Unistrut Corp.'s P1653S beam clamp and P1656A Series anchor clip.

2.07 CHANNEL SUPPORT SYSTEM

- A. Channel Material: 12 gage steel.

- B. Finishes:

1. Phosphate and baked green enamel/epoxy.
2. Pre-galvanized.
3. Electro-galvanized.
4. Hot dipped galvanized.
5. Polyvinyl chloride (PVC), minimum 15 mils thick.

C. Fittings: Same material and finish as channel.

D. UL Listed Systems:

1. B-Line Systems Inc.'s B-22 (1-5/8 x 1-5/8 inches), B-12 (1-5/8 x 2-7/16 inches), B-11 (1-5/8 x 3-1/4 inches).
2. Grinnell Corp.'s Allied Power-Strut PS 200 (1-5/8 x 1-5/8 inches), PS 150 (1-5/8 x 2-7/16 inches), PS 100 (1-5/8 x 3-1/4 inches).
3. Kindorf's B-900 (1-1/2 x 1-1/2 inches), B-901 (1-1/2 x 1-7/8 inches), B-902 (1-1/2 x 3 inches).
4. Unistrut Corp.'s P-3000 (1-3/8 x 1-5/8 inches), P-5500 (1-5/8 x 2-7/16 inches), P-5000 (1-5/8 x 3-1/4 inches).
5. Versabar Corp.'s VA-1 (1-5/8 x 1-5/8 inches), VA-3 (1-5/8 x 2-1/2 inches).

2.08 MISCELLANEOUS FITTINGS

A. Side Beam Brackets: B-Line Systems Inc.'s B102, B103, B371-2, Kindorf's B-915, or Versabar Corp.'s VF-2305, VF-2507.

B. Pipe Straps:

1. Two Hole Steel Conduit Straps: B-Line Systems Inc.'s B-2100 Series, Kindorf's C-144 Series, or Unistrut Corp.'s P-2558 Series.
2. One Hole Malleable Iron Clamps: Kindorf's HS-400 Series, or OZ/ Gedney Co.'s 14-G Series, 15-G Series (EMT).

C. Deck Clamps: Caddy/Erico Products Inc.'s DH-4-T1 Series.

D. Fixture Stud and Strap: OZ/Gedney Co.'s SL-134, or Steel City's FE-431.

E. Supporting Fittings for Pendent Mounted Industrial Type Fluorescent Fixtures on Exposed Conduit System:

1. Ball Hanger: Appleton Electric Co.'s AL Series, or Crouse-Hinds Co.'s AL Series.
2. Flexible Fixture Hanger: Appleton Electric Co.'s UNJ-50, UNJ-75, or Crouse-Hinds Co.'s UNJ115.
3. Flexible (Hook Type) Fixture Hanger: Appleton Electric Co.'s FHHF, or Crouse-Hinds Co.'s UNH-1.
4. Eyelet: Unistrut Corp.'s M2250.
5. Eyelet with Stud: Kindorf's H262, or Unistrut Corp.'s M2350.

6. Conduit Hook: Appleton Electric Co.'s FHSN, or Crouse-Hinds Co.'s UNH-13.
- F. Supporting Fasteners (Metal Stud Construction): Metal stud supports, clips and accessories as produced by Caddy/Erigo Products Inc.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Where specific fasteners are not specified or indicated for securing items to in-place construction, provide appropriate type, size, and number of fasteners for a secure, rigid installation.
- B. Install anchoring devices and other fasteners in accordance with manufacturer's printed instructions.
- C. Make attachments to structural steel wherever possible.

3.02 FASTENER SCHEDULE

- A. Material:
 1. Use cadmium or zinc coated anchors and fasteners in dry locations.
 2. Use hot dipped galvanized or stainless steel anchors and fasteners in damp and wet locations.
 3. For corrosive atmospheres or other extreme environmental conditions, use fasteners made of materials suitable for the conditions.
- B. Types and Use: Unless otherwise specified or indicated use:
 1. Cast-in-place concrete inserts in fresh concrete construction for direct pull-out loads such as shelf angles or fabricated metal items and supports attached to concrete slab ceilings.
 2. Anchoring devices to fasten items to solid masonry and concrete when the anchor is not subjected to pull out loads, or vibration in shear loads.
 3. Toggle bolts to fasten items to hollow masonry and stud partitions.
 4. TPR fasteners to fasten items to plywood backed gypsum board ceilings.
 5. Metallic fasteners installed with electrically operated or powder driven tools for approved applications, except:
 - a. Do not use powder driven drive pins or expansion nails.
 - b. Do not attach powder driven or welded studs to structural steel less than 3/16 inch thick.
 - c. Do not support a load, in excess of 250 lbs from any single welded or powder driven stud.
 - d. Do not use powder driven fasteners in precast concrete.

3.03 ATTACHMENT SCHEDULE

- A. General: Make attachments to structural steel or steel bar joists wherever possible. Provide intermediate structural steel members where required by support spacing. Select steel members for use as intermediate supports based on a minimum safety factor of 5.
 1. Make attachments to steel bar joists at panel points of joists.

2. Do not drill holes in main structural steel members.
 3. Use "C" beam clamps for attachment to steel beams.
- B. Where it is not possible to make attachments to structural steel or steel bar joists, use the following methods of attachment to suit type of construction unless otherwise specified or indicated on the drawings:
1. Attachment to Steel Roof Decking (No Concrete Fill):
 - a. Decking With Hanger Tabs: Use deck clamps.
 - b. Decking Without Hanger Tabs:
 - 1) Before Roofing Has Been Applied: Use 3/8 inch threaded steel rod welded to a 4 x 4 x 1/4 inch steel plate and installed through 1/2 inch hole in roof deck.
 - 2) After Roofing Has Been Applied: Use welding studs, or self-drilling/tapping fasteners. Exercise extreme care when installing fasteners to avoid damage to roofing.
 2. Attachment to Concrete Filled Steel Decks (Total thickness, 2-1/2 inches or more):
 - a. Before Fill Has Been Placed:
 - 1) Use thru-bolts and fish plates.
 - 2) Use welded studs. Do not support a load in excess of 250 pounds from a single welded stud.
 - b. After Fill Has Been Placed: Use welded studs. Do not support a load in excess of 250 lbs. from a single welded stud.
 3. Attachment to Cast-In-Place Concrete:
 - a. Fresh Concrete: Use cast-in-place concrete inserts.
 - b. Existing Concrete: Use anchoring devices.
 4. Attachment to Cored Precast Concrete Decks:
 - a. New Construction: Use thru-bolts and fish plates before Construction Work Contractor has placed concrete fill over decks.
 5. Attachment to Waffle Type Concrete Decks:
 - a. New Construction:
 - 1) Use cast-in-place concrete inserts in fresh concrete.
 - b. If concrete fill has been applied over deck, thru-bolts and fish plates may be used where additional concrete or roofing is to be placed over the deck.
 6. Attachment to Precast Concrete Planks: Use anchoring devices, except do not make attachments to precast concrete planks less than 2-3/4 inches thick.
 7. Attachment to Precast Concrete Tee Construction:
 - a. New Construction:
 - 1) Use tee hanger inserts between adjacent flanges.
 - 2) Use thru-bolts and fish plates, except at roof deck without concrete fill.

- b. Existing Construction:
 - 1) Use anchoring devices installed in webs of tees. Install anchoring devices as high as possible in the webs.
 - c. Do not use powder driven fasteners.
 - d. Exercise extreme care in drilling holes to avoid damage to reinforcement.
- 8. Attachment to Wood Construction: Use side beam brackets fastened to the sides of wood members to make attachments for hangers.
 - a. Under 15 lbs Load: Attach side beam brackets to wood members with 2 No. 18 x 1-1/2 inch long wood screws, or 2 No. 16 x 1-1/2 inch long drive screws.
 - b. Over 15 lbs Load: Attach side beam brackets to wood members with bolts and nuts or lag bolts. Do not use lag bolts in wooden members having a nominal thickness (beam face) under 2 inches in size. Install bolts and nuts or lag bolts in the side of wood members at the mid-point or slightly above. Install plain washers under all nuts.

LOAD	LAG BOLT SIZE	BOLT DIAMETER
15 lbs to 30 lbs	3/8 x 1-3/4 inches	3/8 inch
31 lbs to 50 lbs	1/2 x 2 inches	1/2 inch
Over 50 lbs to load limit of structure.	Use bolt & nut.	5/8 inch

- c. Do not make attachments to the diagonal or vertical members of wood trusses.
- d. Do not make attachments to the nailing strips on top of steel beams.
- 9. Attachment to Metal Stud Construction: Use supporting fasteners manufactured specifically for the attachment of raceways and boxes to metal stud construction.
 - a. Support and attach outlet boxes so that they cannot torque/twist. Either:
 - 1) Use bar hanger assembly, or:
 - 2) In addition to attachment to the stud, also provide far side box support.

3.04 CONDUIT SUPPORT SCHEDULE

- A. Provide number of supports as required by National Electrical Code. Exception: Maximum support spacing allowed is 4'-0" for conduit sizes 3 inches and larger supported from wood trusses.
- B. Use pipe straps and specified method of attachment where conduit is installed proximate to surface of wood or masonry construction.
 - 1. Use hangers secured to surface with specified method of attachment where conduit is suspended from the surface.
- C. Use "C" beam clamps and hangers where conduit is supported from steel beams.
- D. Use deck clamps and hangers where conduit is supported from steel decking having hanger tabs.
 - 1. Where conduit is supported from steel decking that does not have hanger tabs, use clamps and hangers secured to decking, utilizing specified method of attachment.
- E. Use channel support system supported from structural steel for multiple parallel conduit runs.
- F. Where conduits are installed above ceiling, do not rest conduit directly on runner bars, T-Bars, etc.

1. Conduit Sizes 2-1/2 Inches and Smaller: Support conduit from ceiling supports or from construction above ceiling.
2. Conduit Sizes Over 2-1/2 Inches: Support conduit from beams, joists, or trusses above ceiling.

3.05 LIGHTING FIXTURE SUPPORT SCHEDULE

- A. General: Do not solely support fixtures from ceilings or ceiling supports unless it is specified or indicated on the drawings to do so Using one of the methods described below:
1. Support fixtures to structure using 12 Ga. Aircraft Cable. Wires need not be taught to allow for servicing for the fixture.
 2. Support fixtures with hanger rods attached to beams, joists, or trusses. Hanger rod diameter, largest standard size that will fit in mounting holes of fixture.
 - a. Where approved, channel supports may span and rest upon the lower chord of trusses and be utilized for the support of lighting fixtures.
 - b. Where approved, channel supports may span and be attached to the underside of beams, joists, or trusses and be utilized for the support of lighting fixtures.
 3. Use 2 nuts and 2 washers on lower end of each hanger rod to hold and adjust fixture (one nut and washer above top of fixture housing, one nut and washer below top of fixture housing).
 - a. Where specified that an adequately supported outlet box is to support a fixture or be utilized as one point of support, support the box so that it may be adjusted to bring the face of the outlet box even with surface of ceiling.
 4. Provide additional supports when recommended by the manufacturer.
- B. Number of Supports For Ceiling Mounted Lighting Fixtures: Provide at least the following number of supports. Provide additional supports when recommended by fixture manufacturer or shown on the drawings.
1. Commercial and Industrial LED / Fluorescent Fixtures:
 - a. Support individual fixtures less than or equal to 2 feet wide X 4' long nominal at 2 points. In addition, lay in fixtures installed in suspended ceilings shall be secured to the grid using manufacturer's recommended fixture securing clips.
 - b. Support individual fixtures wider than 2 feet at 4 corners.
 - c. Support continuous row fixtures less than 2 feet wide at points equal to the number of fixtures plus one. Uniformly distribute the points of support over the row of fixtures.
 - d. Support continuous row fixtures 2 feet or wider at points equal to twice the number of fixtures plus 2. Uniformly distribute the points of support over the row of fixtures.
 - e. An adequately supported outlet box may be utilized as one point of support for fixtures weighing less than 50 pounds.

3.06 SPECIAL AREA CEILING MOUNTED EQUIPMENT

- A. Provide safety tethers in addition to the standard mounting means for:
1. Lighting fixtures, ceiling speakers, ceiling projectors, etc. installed in Areas of Assembly and/or other high ceiling spaces such as Atriums, Gymnasiums, Natatoriums, Auditoriums, Cafeterias, etc.
 2. Theatrical lighting fixtures.

3.07 CHANNEL SUPPORT SYSTEM SCHEDULE

- A. Use channel support system where specified or indicated on the drawings.
- B. Channel supports may be used, as approved, to accommodate mounting of equipment.
- C. Material and Finish:
 - 1. Dry Locations: Use 12 gage steel channel support system having any one of the specified finishes.
 - 2. Damp Locations: Use 12 gage steel channel support system having any one of the specified finishes except green epoxy/enamel.
 - 3. Wet Locations: Use 12 gage steel channel support system having hot dipped galvanized, or PVC finish.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 260532 – RACEWAYS, FITTINGS AND ACCESSORIES

PART 1 – GENERAL

1.01 REFERENCES

- A. NFPA, NEMA, ANSI, and UL.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's standard catalog sheets, specifications and installation instructions.

1.03 QUALITY ASSURANCE

- A. Electrical components, conductors, devices and accessories described herein shall be listed and labeled as defined by NFPA 70 by a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories (UL), for the intended use and shall bear its label.

PART 2 - PRODUCTS

2.01 RACEWAYS

- A. Rigid Ferrous Metal Conduit (a/ka Galvanized Rigid Conduit (GRC)):
 - 1. Comply with UL 6 and ANSI C80.1.
 - 2. Minimum trade size – 3/4".
 - 3. Provide steel, hot dipped galvanized on the outside and inside, UL categorized as Rigid Ferrous Metal Conduit (identified on UL Listing Mark as Rigid Metal Conduit - Steel or Rigid Steel Conduit), by Allied Tube & Conduit Corp., Republic Conduit, or Wheatland Tube Co or approved equal.
- B. Electrical Metallic Tubing (EMT):
 - 1. Comply with UL 797 and ANSI C80.6.
 - 2. Minimum trade size - 3/4".
 - 3. Provide steel, galvanized on the outside and enameled on the inside, UL categorized as Electrical Metallic Tubing (identified on UL Listing Mark as Electrical Metallic Tubing), by Allied Tube & Conduit Corp Republic Conduit, or Wheatland Tube Co. or approved equal.
- C. Flexible Metal Conduit (FMC):
 - 1. Comply with UL 1.
 - 2. Galvanized steel strip shaped into interlocking convolutions, UL categorized as Flexible Metal Conduit (identified on UL Listing Mark as Flexible Steel Conduit or Flexible Steel Conduit Type RW), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or International Metal Hose Co. or approved equal.

D. Liquid-tight Flexible Metal Conduit (LFMC):

1. Comply with UL 360.
2. UL categorized as liquid-tight flexible metal conduit (identified on UL Listing Mark as Liquid-Tight Flexible Metal Conduit, also specifically marked with temperature and environment application data), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or Universal Metal Hose Co. or approved equal.

E. Rigid Nonmetallic PVC Conduit (RNC), Fittings, and Accessories:

1. Comply with Nema TC2 and UL 651.
2. Minimum trade size – 3/4".
3. UL categorized as Rigid Nonmetallic, Schedule 40 and Schedule 80 PVC conduit (identified on UL Listing Mark as Rigid Nonmetallic Conduit Aboveground and Underground Schedule 40; Rigid Nonmetallic Conduit Aboveground and Underground Extra Heavy Wall Schedule 80), by Beck Mfg./Picoma Industries, Cantex Inc., Carlon/Div. Of Lamson and Sessions, Ipex Inc., National Pipe & Plastics Inc., or Queen City Plastics Inc or approved equal.

F. Surface Metal Raceway, Fittings and Accessories:

1. Comply with UL 5. By Thomas & Betts Corp., Mono-Systems Inc. or Wiremold Co.
2. Provide ivory color unless otherwise noted.
3. Provide minimum Wiremold 700 or equal for single power or data drops. Refer to Division 27 for wireway containing power and technology conductors. Follow manufacturer's recommended raceway capacity for all types and sizes of conductors.

2.02 FITTINGS AND ACCESSORIES

A. Insulated Bushings:

1. Threaded, malleable iron/zinc electroplate with 105 degrees C minimum plastic insulated throat; Appleton Electric Co.'s BU50I Series, Cooper/Crouse-Hinds' 1031 Series, OZ/Gedney Co.'s IBC-50 Series, Raco Inc.'s 1132 Series, Steel City/T & B Corp.'s BI-901 Series, or Thomas & Betts Corp.'s 1222 Series or approved equal.
2. Threaded malleable iron with 150 degrees C plastic throat; Appleton Electric Co.'s BU501 Series, Cooper/Crouse-Hinds' H1031 Series, or OZ/Gedney Co.'s IBC-50 Series.

B. Plastic Bushings for 3/4 Inch Conduit:

1. 105 degrees C minimum temperature rating; Appleton Electric Co.'s BBU50, BBU75, Blackburn (T & B Corp.'s) 50 BB, 75 BB, Cooper/Crouse-Hinds' 931,932, or OZ/Gedney Co.'s IB-50, IB-75, Raco Inc.'s 1402, 1403, Steel City/T & B Corp.'s BU-501, BU-502, or Thomas & Betts Corp.'s 222, 223 or approved equal.
2. 150 degrees C temperature rating; Appleton Electric Co.'s BBU50H, BBU75H, Cooper/Crouse-Hinds' H-931, H-932, or OZ/Gedney Co.'s A-50, A-75 or approved equal.

C. Insulated Grounding Bushings:

1. Threaded, malleable iron/zinc electroplate with 105 degrees C minimum plastic insulated liner, and ground lug; Appleton Electric Co.'s GIB-50 Series, Cooper/Crouse-Hinds' GLL Series, OZ/Gedney Co.'s IBC-50L Series, Raco Inc.'s 1212 Series, Steel City/T & B Corp.'s BG-801 (1/2 to 2") Series, or Thomas & Betts Corp.'s 3870 or approved equal.
2. Threaded malleable iron/zinc electroplate with 150 degrees C plastic insulated liner, and ground lug; Appleton Electric Co.'s GIB Series, Cooper/Crouse-Hinds' HGLL Series, or OZ/Gedney Co.'s IBC-50L Series, or Thomas & Betts Corp.'s 3870 or approved equal.

D. Connectors and Couplings:

1. Locknuts: UL, steel/zinc electroplate; Appleton Electric Co.'s BL-50 Series, Cooper/Crouse-Hinds' 11 Series, OZ/Gedney Co.'s 1-50S Series, Raco Inc.'s 1002 Series, Steel City/T&B Corp.'s LN-101 Series, or Thomas & Betts Corp.'s 141 Series or approved equal.
2. Grounding Wedge: Thomas & Betts Corp.'s 3650 Series or approved equal.
3. Couplings For Rigid Metal and IMC Conduit: Standard galvanized threaded couplings as furnished by conduit manufacturer, Allied Tube & Conduit Corp.'s Kwik-Couple, or Thomas & Betts Corp.'s Shamrock.
4. Three Piece Conduit Coupling For Rigid Metal and IMC Conduit: Steel, malleable iron, zinc electroplate; Allied Tube & Conduit Corp.'s Kwik-Couple, Appleton Electric Co.'s EC-50 Series, Cooper/Crouse-Hinds' 190M Series, OZ/Gedney Co.'s 4-50 Series, Raco Inc.'s 1502 Series, Steel City/T & B Corp.'s EK-401 Series, or Thomas & Betts Corp.'s 675 Series.
5. Electrical Metallic Tubing Couplings and Insulated Connectors: Set screw type fittings are not permitted. Provide Compression type, steel/zinc electroplate; Appleton Electric Co.'s TW-50CS1, TWC-50CS Series, Cooper/Crouse-Hinds' 1650, 660S Series, Raco Inc.'s 2912, 2922 Series, Steel City/T & B Corp.'s TC-711 Series, or Thomas & Betts Corp.'s 5120, 5123 Series or approved equal.
6. Flexible Metal Conduit Connectors: Arlington Industries Inc.'s Saddle-Grip, OZ/Gedney Co.'s C-8T, 24-34T, ACV-50T Series, or Thomas & Betts Corp.'s Nylon Insulated Tite-Bite Series or approved equal.
7. Liquid-tight Flexible Metal Conduit Connectors: Steel, malleable iron, zinc electroplate, insulated throat; Appleton Electric Co.'s STB Series, Cooper/Crouse-Hinds' LTB Series, OZ/Gedney Co.'s 4Q-50T Series, Raco Inc.'s 3512 Series, Steel City/T & B Corp.'s LT-701 Series, or Thomas & Betts Corp.'s 5332 Series or approved equal.

E. Conduit Bodies (Threaded):

1. Malleable Iron/Zinc Electroplate: Zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, OZ/Gedney Co.'s Conduit Bodies, or Thomas & Betts Corp.'s Conduit Bodies. Or approved equal.

F. Expansion Fittings:

1. Malleable Iron, Zinc Electroplate Finish: Appleton Electric Co.'s XJ or OZ/Gedney Co.'s AX (TX for EMT), with external bonding jumper or approved equal.
2. Electrogalvanized Steel: Cooper/Crouse-Hinds' XJG (XJG-EMT for EMT), or Thomas & Betts Corp.'s XJG, with internal grounding or approved equal.

- G. Deflection Fittings: Appleton Electric Co.'s DF, Cooper/Crouse-Hinds' XD, or OZ/Gedney Co.'s Type DX or approved equal.
- H. Surface Metal Raceways: Use manufacturers approved fittings: couplings, ells, offsets, boxes etc. listed for use with ther raceway system. Match raceway finish.
- I. Sealant for Raceways Exposed to Different Temperatures: Sealing compounds and accessories to suit installation; Appleton Electric Co.'s DUC, or Kwiko Sealing Compound with fiber filler, Cooper/Crouse-Hinds' Chico A Sealing Compound with Chico X fiber, Electrical Products Division 3M Scotch products, OZ Gedney Co.'s DUX or EYC sealing compound with EYF damming fiber, or Thomas & Betts Corp.'s Blackburn DX.
- J. Vertical Conductor Supports: Kellems/Hubbell Inc.'s Conduit Riser Grips, or OZ/Gedney Co.'s Type M, Type R.
- K. Pulling-In-Line For Installation in Spare and Empty Raceways: Polypropylene monofilament utility line; Greenlee Textron Inc.'s Poly Line 430, 431, or Ideal Industries Powr-Fish Pull-Line 31-340 Series.

PART 3 - EXECUTION

3.01 RACEWAY INSTALLATION - GENERAL

- A. Install an equipment grounding conductor in all raceways. Raceway shall NOT be relied upon as an equipment ground conductor.
- B. For New Work: Number of Raceways: Do not change number of raceways to less than the number indicated on the drawings.
 - 1. Each raceway shall enclose one circuit unless otherwise indicated on the drawings.
- C. For Rehab work. Number of Raceways: Do not change number of raceways to less than the number indicated on the drawings except when appropriate for advantageous reuse of existing exposed and concealed raceways (the contract documents do not indicate location, number, size or condition of existing raceways). Existing raceways may be reused if the following conditions are met:
 - 1. The existing raceway must be of adequate size for the new conductors to be installed as per NFPA 70 Chapter 9, Tables 1, 4, & 5; Annex C, Tables C1-C12a. More circuits may be enclosed by existing raceways than the circuiting shown on the drawings provided conductor sizes are increased to compensate for derating (adjustment factors) and other considerations required by NFPA 70 Article 310-15.
 - 2. Remove existing conductors.
 - 3. Demonstrate to the Owner's Representative that the existing raceway is clear of obstructions and in good condition.
 - 4. Check ground continuity. When ground continuity of existing raceway is inadequate install insulated grounding bushings, grounding wedges, bonding straps, grounding jumpers or equipment grounding conductors to establish effective path to ground.
 - 5. Install insulated bushings to replace damaged or missing bushings. Replace non-insulated bushings with insulated bushings on raceway sizes 1 inch and larger.

6. Install vertical conductor supports to replace existing or missing vertical conductor supports.
 7. Install extension rings on existing boxes when the number of new conductors installed therein exceeds NFPA 70 requirements.
 8. Furnish the Owner's Representative with marked up drawings showing size and routing of existing raceways with number and size of new conductors installed therein. The drawings will be forwarded to the design engineer for verification of NFPA 70 compliance.
- D. Raceways for Future Use (Spare Raceways and Empty Raceways): Draw fish tape through raceways in the presence of the Director's Representative to show that the raceway is clear of obstructions.
1. Leave a pulling-in line in each spare and empty raceway.
- E. Conduit Installed Concealed:
1. Install conduit concealed unless otherwise indicated on the drawings.
 2. Existing Construction:
 - a. Run conduit in existing chases and hung ceilings.
 - b. If conduit cannot be installed concealed due to conditions encountered in the building, report such conditions and await approval in writing before proceeding.
 3. New Construction:
 - a. Run conduit in the ceilings, walls, and partitions.
 - b. Conduit may not be installed in concrete floor slab unless otherwise indicated on the plans. (concrete slabs that are both ceilings and floors shall be treated as floor slabs).
 - c. Where indicated on the drawings, install conduit in concrete slabs, under slabs on grade, or under slabs above finished ceilings where indicated on the drawings. Concrete slabs that are both ceilings and floors shall be treated as floor slabs.
 - 1) Conduit in Slab: Run 3/4-inch conduit in the slab where placement of reinforcement and slab thickness is sufficient to allow 1-1/2 inches of concrete cover over conduit, otherwise run conduit under slab. Run conduit one inch and larger in the slab in the specific location(s) where it is indicated on the drawing to be run in the slab, otherwise run conduit under slab.
 - a) Run conduit under reinforcement where reinforcement is in upper portion or middle of slab.
 - b) Run conduit over reinforcement where reinforcement is in lower portion of slab.
 - c) Run conduit between reinforcement where reinforcement is in upper and lower portions of slab.
 - d) Separate parallel conduits minimum of 2 inches so that each conduit will be enveloped in concrete.
 - e) Pass conduit over steel beams, if any, parallel with the reinforcement.
 - f) Tie down conduit to avoid movement during placement of concrete.
 - g) Demonstrate to the Owner's Representative that conduit has been placed to allow minimum of 1-1/2 inches of concrete cover.
 - 2) Conduit Under Slab on Grade:
 - a) Run conduit under vapor barrier, if any.
 - b) Install equipment grounding conductor in each conduit. Bond at boxes and equipment to which conduit is connected.

- 3) Conduit Under Slab, Above Finished Ceiling:
 - a) Attach conduit to bottom of slab or structure supporting the slab.
 - b) Firestop through-penetrations of the slab.
4. If any portions of the conduit system cannot be installed concealed due to conditions encountered in the building, report such conditions and await approval in writing before proceeding.
- F. Conduits Penetrating Concrete Floor Slabs (Concrete slabs that are both ceilings and floors shall be treated as floor slabs):
 1. Provide a minimum of 2 inches between conduits that vertically penetrate elevated concrete slabs.
 2. Provide firestopping and spray on fireproofing at locations where conduits penetrate surface of floor slab and slab is part of fire rating required for construction.
- G. Conduit Installed Exposed:
 1. Install conduit exposed where indicated on the drawings.
 2. Install surface metal raceway on existing block wall construction in finished areas.
 3. Install conduit tight to the surface of the building construction unless otherwise indicated or directed.
 4. Install vertical runs perpendicular to the floor.
 5. Install runs on the ceiling perpendicular or parallel to the walls.
 6. Install horizontal runs parallel to the floor.
 7. Do not run conduits near heating pipes.
 8. Installation of conduit directly on the floor will not be permitted.
 9. Exposed conduits installed in finished area shall be painted by the Electrical Contractor to match surrounding areas. Exception – where general painting will be provided by other trades.
- H. Conduit Size: **Not smaller than 3/4-inch electrical trade size**. Where type FEP, THHN, THWN, THWN-2, XHH, XHHW, or XHHW-2 conductors are specified for use under Section 260519, the minimum allowable conduit size for new Work shall be based on Type THW conductors.
- I. Conduit Bends: For 3/4-inch conduits, bends may be made with manual benders. For all conduit sizes larger than 3/4 inch, manufactured or field fabricated offsets or bends may be used. Make field fabricated offsets or bends with an approved hydraulic bender.

3.02 RACEWAY INSTALLATION - SPECIAL AREAS

- A. Raceways Exposed to Different Temperatures: Where portions of an interior raceway system are exposed to widely different temperatures, seal interior and exterior of raceway to prevent circulation of air from a warmer to a colder section through the raceway installation.

1. Refrigerated Rooms: Install conduit body or junction box in the raceway system on warm side of refrigerated room. After conductors are installed, seal interior of the raceway at the conduit body or junction box.
 2. Heated Areas to Unheated Areas: After conductors are installed, seal interior of the raceway at the nearest conduit body, outlet or junction box in the heated area adjoining the unheated area.
- B. Conduit for Prefabricated Walk-In Refrigeration Boxes:
1. Install box wiring in conduit. Run conduit exposed on exterior of box unless project conditions require conduit to be run exposed on interior of box.
 - a. Install rigid ferrous metal conduit and galvanized fittings where the metal surfaces are galvanized steel.
 2. Create a thermal break where penetrating the box by installing maximum of 12 inches of Schedule 40 high density polyethylene conduit within the conduit run at the penetration. Seal the penetration.
 3. Install equipment grounding conductor in each conduit.
 4. Seal raceway as specified for raceways exposed to different temperatures.
- C. Conduits in Heating Tunnels: Install rigid ferrous metal conduit exposed in the tunnel and run conduit to avoid manhole entrances and other obstructions. Install equipment grounding conductor in each conduit.
- D. Conduit in Waterproofed Floors: Install conduit runs in waterproof floors to avoid penetrating the waterproofing. Avoid penetration of waterproofing with conduit risers so far as practicable.
1. Where it is necessary to puncture the waterproofing for a conduit riser, install a standard weight steel pipe sleeve extending one inch above the finished floor level. Flash the steel pipe sleeve to the waterproofing with 16-ounce copper. Construct the flashing with a copper tube extending the full height of the sleeve, soldered to a copper base extending 6 inches in all directions from the sleeve.
 2. The flashing will be integrated into the waterproofing by the Construction Contractor. Provide solid cast brass floor plates with chromium finish where pipe sleeves are exposed in rooms.

3.03 RACEWAY SCHEDULE

- A. Rigid Ferrous Metal Conduit: Install in all locations unless otherwise specified or indicated on the drawings.
- B. Electrical Metallic Tubing:
1. May be installed concealed as feeder or branch circuit conduits above suspended ceilings where conduit does not support fixtures or other equipment.
 2. May be installed concealed as feeder or branch circuit conduits in hollow areas in dry locations, including:
 - a. Hollow concrete masonry units, except where cores are to be filled.
 - b. Drywall construction with sheet metal studs, except where studs are less than 3-1/2 inches deep.

3. May be installed exposed as feeder or branch circuit conduits in dry, unfinished, non-hazardous locations.
- C. Flexible Metal Conduit: Install equipment grounding conductor in the flexible metal conduit and bond at each box or equipment to which conduit is connected:
1. Use for final conduit connection to recessed lighting fixtures in suspended ceilings. Use 4 to 6 feet of flexible metal conduit, minimum size 1/2 inch, between junction box and fixture. Locate junction box at least 1 foot from fixture and accessible if the fixture is removed.
 2. Use 1 to 3 feet of flexible metal conduit for final conduit connection to:
 - a. Emergency lighting units.
 - b. Dry type transformers.
 - c. Motors with open, drip-proof or splash-proof housings.
 - d. Equipment subject to vibration (dry locations).
 - e. Equipment requiring flexible connection for adjustment or alignment (dry locations).
 3. Use for concealed branch circuit conduits above existing non-removable suspended ceilings where rigid type raceways cannot be installed due to inaccessibility of space above ceiling.
 4. May be installed concealed as branch circuit conduits in drywall construction with sheet metal studs, except where studs are less than 3-1/2 inches deep.
- D. Liquid-tight Flexible Metal Conduit: Install equipment grounding conductor in liquid-tight flexible metal conduit and bond at each box or equipment to which conduit is connected:
1. Use 1 to 3 feet of liquid-tight flexible metal conduit (UL listed and marked suitable for the installation's temperature and environmental conditions) for final conduit connection to:
 - a. Motors with weather-protected or totally enclosed housings.
 - b. Equipment subject to vibration (damp and wet locations).
 - c. Equipment requiring flexible connection for adjustment or alignment (damp and wet locations).
- E. Rigid Nonmetallic PVC Conduit:
1. Schedule 40 or Schedule 80 as indicated on the drawings.
 - a. Use for protection of primary feeders within transformer vaults.
 - b. Use for exterior branch circuits or feeders.
 - c. Use underground or under slab feeders or branch circuits.
- F. Surface Metal Raceway: Use as exposed raceway system in finished spaces with existing CM U or concrete construction or at locations indicated on the drawings.
1. Use surface metal raceway system of size required for number of wires to be installed therein. Use specific size when indicated on the drawings.
 2. Do not run raceway through walls that have a plaster finish nor through masonry walls or floors. Install a pipe sleeve, or a short length of conduit with junction boxes or adapter fittings for raceway runs through such areas. Run raceway along top of baseboards, care being taken to avoid telephone and other signal wiring. Where raceway crosses chair railing or picture molding, cut the chair railing or picture molding to permit the raceway to lie flat against the wall.

Run raceway around door frames and other openings. Run raceway on ceiling or walls perpendicular to or parallel with walls and floors.

3. Secure raceway at intervals not exceeding 36 inches.
 4. Install separate equipment grounding conductor for grounding of equipment. The raceway alone will not be considered suitable for use as an effective path to ground.
 5. Outlet box covers for pendant mounted fluorescent fixtures may be omitted if the fixture canopy is notched to receive the raceway and the canopy fits snugly against the ceiling.
 6. Where equipment is mounted on an outlet box and the equipment base is larger than the outlet box, provide finishing collar around equipment base and outlet box or provide finishing collar/outlet box:
 - a. Finishing Collar: Same finish and peripheral dimensions as the equipment base, including provisions for mounting, slots to fit over raceway and of depth to cover outlet box and extend back to ceiling or wall.
 - b. Combination Finishing Collar/Outlet Box: Same finish and peripheral dimensions as the equipment base to be mounted thereon, gage or thickness of metal as required by NFPA 70, including provision for mounting and knockouts for entrance of raceway.
- G. Wireways: May be used indoors in dry locations for exposed raceway between grouped, wall mounted equipment.

3.04 FITTINGS AND ACCESSORIES SCHEDULE

A. General:

1. Use fittings and accessories that have a temperature rating equal to, or higher than the temperature rating of the conductors to be installed within the raceway.
2. Use zinc electroplate or hot dipped galvanized steel/malleable iron or cast iron alloy fittings and accessories in conjunction with ferrous raceways in dry and damp locations unless otherwise specified or indicated on the drawings.
3. Use insulated grounding bushings or grounding wedges on ends of conduit for terminating and bonding equipment grounding conductors, when required, if cabinet or boxes are not equipped with grounding/bonding screws or lugs.
4. Use caps or plugs to seal ends of conduits until wiring is installed to exclude foreign material.
5. Use insulated grounding bushings on the ends of conduits that are not directly connected to the enclosure, such as stub-ups under equipment, etc., and bond between bushings and enclosure with equipment grounding conductor.
6. Use expansion fittings where raceways cross expansion joints (exposed, concealed, buried).
7. Use deflection fittings where raceways cross expansion joints that move in more than one plane.
8. Use 2 locknuts and an insulated bushing on end of each conduit entering sheet metal cabinet or box in dry or damp locations.
 - a. Plastic bushing may be used on 3/4 inch conduit in lieu of insulated bushing.
 - b. Terminate conduit ends within cabinet/box at the same level.

- B. For Rigid Metal Conduit: Use threaded fittings and accessories. Use 3 piece conduit coupling where neither piece of conduit can be rotated.
- C. For Electrical Metallic Tubing: Use compression type connectors and couplings.
- D. For Flexible Metal Conduit: Use flexible metal conduit connectors.
- E. For Liquid-tight Flexible Metal Conduit: Use liquid-tight connectors.
- F. For Rigid Nonmetallic PVC Conduit:
 - 1. Use conduit manufacturer's standard fittings and accessories.
 - 2. Provide expansion fittings for exterior conduits as required by NFPA 70.
- G. For Surface Metal Raceway: Use raceway manufacturer's standard fittings and accessories. Match raceway finish color.
- H. For Wireways: Use wireway manufacturer's standard fittings and accessories.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 260534 – OUTLET JUNCTION AND PULL BOXES

PART 1 – GENERAL

1.01 REFERENCES

- A. NEMA, and UL.

1.02 SUBMITTALS

- A. Product Data: Manufacturer's standard catalog sheets, specifications and installation instructions.

1.03 QUALITY ASSURANCE

- A. Electrical components, conductors, devices and accessories described herein shall be listed and labeled as defined by NFPA 70 by a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories (UL), for the intended use and shall bear its label.

PART 2 - PRODUCTS

2.01 GALVANIZED STEEL OUTLET BOXES

- A. Provide standard galvanized steel boxes and device covers in compliance with NEMA OS1 And UL 514A by Appleton Electric Co., Beck Mfg./Picoma Industries, Cooper/Crouse-Hinds, Raco/Div. of Hubbell, or Steel City/T & B Corp or approved equal.

2.02 GALVANIZED STEEL JUNCTION AND PULL BOXES

- A. Provide code gage, galvanized steel screw cover boxes in compliance with NEMA OS1 by Delta Metal Products Inc., Hoffman Enclosures Inc., Hubbell Wiegmann, Lee Products Co., or Rittal/Electromate or approved equal.

2.03 THREADED TYPE BOXES

- A. Outlet Boxes:

1. For Dry, Damp Locations: Provide zinc electroplate malleable iron or cast iron alloy boxes by Appleton Electric Co., Cooper/Crouse-Hinds Co., or OZ/ Gedney Co., or approved equal, with zinc electroplate steel covers to suit application.
2. For Wet Locations: Provide malleable iron or cast iron alloy boxes with hot dipped galvanized or other specified corrosion resistant finish in compliance with NEMA FB1 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.

- B. Junction And Pull Boxes:

1. For Dry, Damp Locations: Provide zinc electroplate cast iron boxes by Appleton Electric Co., Cooper/Crouse-Hinds, or OZ/Gedney Co., or approved equal with zinc electroplate steel or cast iron cover.

2. For Wet Locations: Provide cast iron boxes in compliance with NEMA FB1 and UL 1773 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.

C. Conduit Bodies, Threaded (Provided with a Volume Marking):

1. For Dry, Damp Location: Provide zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, or OZ/Gedney Co.'s Conduit Bodies or approved equal.
2. For Wet Locations: Provide 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.

2.04 CORROSION RESISTANT BOXES

- A. Plastic Coated Outlet and Junction Boxes: Provide threaded type malleable iron boxes coated with 40 mils thick polyvinylchloride coating; Ocal/T&B Corp.'s Ocal-Blue System, PCD Inc.'s KorKap, KorKap XL, or Robroy Industries' Plastibond or Perma-Cote System or approved equal.
- B. Non-Metallic Junction and Pullboxes: Glass fiber reinforced polyester; Carlon/Div. of Lamon and Sessions' Himeline Series, Cooper/Crouse-Hinds' Krydon Products, or Robroy Industries' Stahlin Enclosures or approved equal.

2.05 SPECIFIC PURPOSE OUTLET BOXES

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

2.06 FINISHING COLLAR OR COMBINATION FINISHING COLLAR/OUTLET BOX (SURFACE MOUNTED EQUIPMENT USED WITH EXPOSED RACEWAY)

- A. Finishing Collar: Same finish and peripheral dimensions as the equipment base, including provisions for mounting, slots to fit over raceway and of depth to cover outlet box and extend back to ceiling or wall.
- B. Combination Finishing Collar/Outlet Box: Same finish and peripheral dimensions as the equipment base, gage or thickness of metal as required by National Electrical Code, including provisions for mounting, and knockouts or threaded bosses for entrance of raceway.

2.07 FLOOR OUTLETS

- A. For combination power and technology floor boxes and outlets – refer to Division 27.
- B. Floor Outlet for Cast-In-Place Concrete Construction; Hubbell's Floor Boxes, Raco Inc.'s Tilt Top, or Steel City/T & B Corp.'s Floor Boxes:
 1. Concrete tight galvanized steel boxes (for installation above grade).
 2. Watertight cast iron boxes (for installation on or below grade).
 3. Fully adjustable top (including 10-degree angular adjustment) before and after installation.
 4. Service Fittings:

- a. Above Floor: Aluminum, doghouse style, to suit power, service.
- b. Flush Floor: Flush round cover with hinged lid (and carpet flanges for carpeted areas) to suit power service, finish to match hardware in area where installed.

2.08 OUTLET BOXES AND RELATED PRODUCTS FOR FIRE RATED CONSTRUCTION

- A. For combination power and technology floor boxes and outlets – refer to Division 27.
- B. Parameters For Use of Listed Metallic Outlet or Switch Boxes: UL Electrical Construction Equipment Directory - Metallic Outlet Boxes (QCIT).
- C. Wall Opening Protective Materials: As listed in UL Fire Resistance Directory - Wall Opening Protective Materials (CLIV), or UL Electrical Construction Equipment Directory - Wall Opening Protective Materials (QCSN).
- D. Floor Outlet Boxes:
 - 1. Poke-Through System: As listed in UL Fire Resistance Directory - Outlet Boxes and Fittings Classified for Fire Resistance (CEYY), or UL Electrical Construction Equipment Directory - Outlet Boxes and Fittings Classified for Fire Resistance (QBWY).
 - 2. Service Fittings:
 - a. Above Floor: Aluminum, doghouse style, to suit power service.
 - b. Flush Floor: Metallic flush round cover with hinged lid (and carpet flanges for carpeted areas) to suit power service, finish to match hardware in area where more installed.

PART 3 - EXECUTION

3.01 GENERAL

- A. Provide all boxes required to complete the raceway system, regardless of whether indicated or not on the drawings.
- B. Provide boxes in sizes as required by Code.
- C. Provide dividers in boxes where difference in insulation rating exceeds 300V.

3.02 PREPARATION

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

3.03 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:

Lighting Fixtures	6'-0"
Lighting Fixtures in Stairway	7'-6"

Exit Lights	8'-0" where ceiling height allows a minimum of 6 inch clearance between ceiling and top of exit light. Otherwise mount exit light so that it's top is 6 inches below finished ceiling. Adjust height and clearances as required to suit installation over doors.
Night Lights	2'-0"
Hose Cabinet Lights	1'-0" above top of cabinet
Switches	4'-0"
Single & Duplex Receptacles	1'-6"*
Water Cooler Receptacles	2'-0"
Clock Receptacles	7'-6"
Range Receptacle	1'-6"
Special Purpose Receptacles	4'-0"
Thermostats	5'-0"
Manual Fire Alarm Boxes	4'-0"
Audible Notification Appliances	8'-0" where ceiling height allows a minimum of 6 inch clearance between ceiling and top of appliance. Otherwise mount appliance so that it's top is 6 inches below finished ceiling.
Visible Notification Appliances	Install outlet so that the bottom of the visible lens will be 6'-8" AFF.
Combination Audible/Visible Notification Appliances	Install outlet so that the bottom of the visual lens will be 6'-8" AFF, and the audible section will be above the visible section.
Radio	2'-0"
Television	2'-0"
Telecommunications	2'-0"
Telephone	2'-0"
Wall Handset Telephone.	Install outlet so that the highest operable part of the wall mounted telephone will not be more than 4'-0" AFF.

*In areas containing heating convectors, install outlets above convectors at height indicated on drawings.

C. 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.

3.04 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.
2. Recessed Boxes in Fire Rated (2 hour maximum) Bearing and Nonbearing Wood or Steel Stud Walls (Gypsum Wallboard Facings):
 - a. Use listed single and double gang metallic outlet and switch boxes. The surface area of individual outlet or switch boxes shall not exceed 16 square inches.
 - b. The aggregate surface area of the boxes shall not exceed 100 square inches per 100 square feet of wall surface.
 - c. Securely fasten boxes to the studs. Verify that the opening in the wallboard facing is cut so that the clearance between the box and the wallboard does not exceed 1/8 inch.
 - d. Separate boxes located on opposite sides of walls or partitions by a minimum horizontal distance of 24 inches. This minimum separation distance may be reduced when wall opening protective materials are installed according to the requirements of their classification.
 - e. Use wall opening protective material in conjunction with boxes installed on opposite sides of walls or partitions of staggered stud construction in accordance with the classification requirements for the protective material.
 3. Other Fire Rated Construction: Use materials and methods to comply with the listing requirements for the classified construction.
- 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.
 3. Finishing Collar or Combination Finishing Collar/Outlet Box (Surface Mounted Equipment Used With Exposed Raceway):

- a. Use finishing collar where surface mounted equipment is installed on an exposed raceway outlet box and the equipment base is larger than the outlet box.
 - b. Use combination finishing collar/outlet box where surface mounted equipment is not indicated to be installed on an exposed raceway outlet box, but raceway cannot be run directly into equipment body due to equipment design.
- 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, manufacturer's standard steel (painted) boxes for surface metal raceway system and galvanized steel for recessed installations.
- D. Stencil cover of pull boxes used on systems over 600 V, in white lettering minimum 1/2 inches high, the words "DANGER HIGH VOLTAGE - KEEP OUT".

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 260543 – UNDERGROUND CABLE AND CONDUIT SYSTEMS

PART 1 – GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 033000 – Cast-In-Place Concrete
- C. Section 260519 – Low Voltage Electrical Power Conductors and Cables
- D. Section 310000 – Earthwork

1.02 SUBMITTALS

- A. Product Data: Manufacturer's standard catalog sheets, specifications and installation instructions.
- B. Unless noted otherwise, specific manufacturer's and / or model / part numbers indicated in this specification section, shall be interpreted as that "manufacturer and/or model / part number" or equal.

1.03 QUALITY ASSURANCE

- A. Electrical components, conductors, devices and accessories described herein shall be listed and labeled as defined by NFPA 70 by a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories (UL), for the intended use and shall bear its label.

PART 2 - PRODUCTS

2.01 GENERAL MATERIALS

- A. Conductors and cables:
 - 1. Underground conductors, for electric light and power, rated 600V or less, whether direct buried or in conduit, shall be listed for use in wet locations and shall conform to the requirements of Section 260519.
 - 2. Underground cabling, rated 601 volts and above, shall be as specified on the Contract Drawings, and shall meet the requirements of the serving utility, where applicable.
- B. Rigid Ferrous Metal Conduit: Steel, galvanized on the outside and inside (conduit enameled on the inside will not be accepted), UL categorized as Rigid Ferrous Metal Conduit (identified on UL Listing Mark as Rigid Metal Conduit-Steel or Rigid Steel Conduit), as manufactured by Allied Tube & Conduit Corp., LTV Steel Tubular Products Co., Triangle Wire & Cable Inc., or Wheatland Tube Co.
- C. Rigid Nonmetallic Conduit and Fittings (Concrete Encased): Cantex, Inc.'s Schedule 40 or Schedule 80, Carlon Electrical Products Inc.'s Plus 40, CertainTeed Corp.'s Schedule 40, Omni/Opti-Com Manufacturing Network, Inc.'s Schedule 40 or Queen City Plastic Inc.'s Schedule 40 or Schedule 80.
- D. Plastic Coated Rigid Metal Conduit, Fittings and Accessories: Rigid ferrous metal conduit, fittings

and accessories coated with 40 mils thick polyvinylchloride coating; Occidental Coating Co.'s Ocal 40, Protective Coatings Developments Inc.'s Kor-Kap, or Robroy Industries' Plastibond System.

- E. Conduit Spacers and Levelers: Commercially manufactured type to suit conduit, installation and spacing requirements.
- F. Duct Seal: Appleton Electric Co.'s DUC Weatherproof Compound, Manville Corp.'s Duxseal, OZ/Gedney Co.'s DUX, or Thomas & Betts Corp.'s DX.
- G. Drag Line: Minimum 1/8-inch polypropylene monofilament utility rope; American Synthetic Ropes' Flotorope, Greenlee Tool Co.'s 2 ply Rope 431, or Thomas Industries/Jet Line Products' Rope 232.
- H. Thru Wall Sealing Bushings:
 - 1. For Walls Which Have or Will Have Membrane Waterproofing:
 - a. Cast-In-Place Installations: OZ/Gedney Co.'s Type FSK thruwall seal and Type FSKA membrane clamp adapter.
 - b. Core Drilled or Sleeved Installations: OZ/Gedney Co.'s Type CSM and Type CSMC with membrane clamp adapter.
 - 2. For Walls Which Will Not Have Membrane Waterproofing:
 - a. Cast-In-Place Installations: OZ/Gedney Co.'s Type FSK.
 - b. Core Drilled or Sleeved Installations: OZ/Gedney Co.'s Type CSM, or Thunderline Corp.'s Link-Seal.
- I. End Bells:
 - 1. For Rigid Ferrous Metal Conduit: OZ/Gedney Co.'s Type TNS.
 - 2. For Rigid Nonmetallic Conduit: Conduit manufacturer's standard end bells.
- J. Insulated Grounding Bushings: Appleton Electric Co.'s GIB-50 Series, Crouse Hinds GLL Series, OZ/Gedney Co.'s IBC-50L Series, Raco Inc.'s 1212 Series, or Thomas & Betts Corp.'s 3870 or BG Series.
- K. Underground Warning Tape:
 - 1. Aluminum backed, 6-inch wide by 0.005-inch-thick underground warning tape with a Red background color (electric) or orange background color (telecommunications) as applicable.
 - 2. Black lettering "CAUTION – BURIED ELECTRIC LINE BELOW" or "CAUTION – BURIED TELECOMMUNICATIONS LINE BELOW" as applicable.

2.02 POLYMER CONCRETE HANDHOLES AND BOXES WITH POLYMER CONCRETE COVER

- A. Description: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.
 - 1. Manufacturers:
 - a. Armorcast Products Company
 - b. Carson Industries LLC
 - c. Oldcastle
 - d. Quazite: Hubbell Power Systems, Inc.

- B. Standard: Comply with ANSI/SCTE 77.
- C. Minimum design loads: Unless otherwise noted, minimum design loads shall meet ANSI/SCTE/77 Tier 22 Ratings: 22,500 lbs vertical design load and 800 lbs/sq.ft. lateral, tested at 150% Of the design loads.
- D. Color of Frame and Cover: Gray.
- E. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.
- F. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
- G. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
- H. Cover Legend: Molded lettering, "ELECTRIC."
- I. Handholes 12 inches wide by 24 inches long and larger shall have factory-installed inserts for cable racks and pulling-in irons.
- J. Provide divider to separate wiring with insulation levels exceeding 300V.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Obtain all required utility markouts as per State / Local Laws and Codes and as specified elsewhere in the project specifications. Maintain markings until no longer required.
- B. Prior to installing any Work, lay out the proposed course for the conduits, location of manholes, etc. and have same approved by the Owner's Representative.

3.02 UNDERGROUND CONDUIT INSTALLATION

- A. Spacing:
 - 1. Arrangement for Power and Signal Service: Separate power system conduits from signal system conduits with minimum 6 inches thick concrete wall or 12 inches of earth.
 - 2. Conduit Bank: Separate individual conduits a minimum of 3 inches. Use spacers and levelers located no more than 8 feet apart. Separators between tiers shall be staggered approximately 6 inches between tiers.
- B. Depth:
 - 1. Light and Power Cabling rated 600V and Below, Telecommunications, Fiber Optic, and other Low Voltage systems: Unless otherwise indicated or directed, install conduit at least 24 inches below finished grade to top of highest conduit.
 - 2. Electric Light and Power Cabling Rated 601V and Higher: Unless otherwise indicated or directed, install conduit at least 36 inches below the finished grade to top of the conduit.
 - 3. Crossing Obstructions: Use rigid ferrous metal conduit where top of conduit system is less than 18 inches below finished grade when crossing obstructions (heating tunnels, etc.).

4. In Rock:

- a. Unless otherwise indicated on the drawings install rigid ferrous metal conduit or concrete encased rigid nonmetallic conduit at depths previously specified. Backfill with suitable material in accordance with SECTION 310000 - EARTHWORK.
- b. Where conduit is indicated to be installed at lesser depths, use rigid ferrous metal conduit. Cover conduit with minimum 2 inches of concrete. In exposed rock area fill trench with concrete to surface level of rock. Where rock is not exposed, complete backfill in accordance with SECTION 310000 - EARTHWORK.

C. Pitch:

1. Pitch conduit away from buildings.
2. Pitch conduit toward manhole a minimum of 3 inches per 100 feet. On runs where it is impossible to maintain the grade all one way, grade from center so that conduits pitch both directions down toward manholes.

D. Concrete Encasement for Rigid Non-Metallic Conduit Using Either of the Two Methods Indicated Below: (Concrete Encasement for Rigid Ferrous Metal Conduit is not Required):

1. Single Pour Method:

- a. Concreting Sequence: Pour each run of envelope between handholes or other terminations in one continuous operation.
 - 1) Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations or use other specific measures to prevent expansion-contraction damage.
 - 2) If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch (19-mm) reinforcing rod dowels extending 18 inches (450 mm) into concrete on both sides of joint near corners of envelope.
- b. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in the middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.
- c. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
- d. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
- e. Stub-Ups: Use manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - 1) Couple steel conduits to ducts with adapters designed for this purpose and encase coupling with 3 inches of concrete.
 - 2) Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.

2. Two Pour Method:

- a. Lay rigid nonmetallic conduits on a continuous concrete footing not less than 3 inches thick and as wide as the encasement. Install footings straight and true both in line of run and transversely and finished with an even surface. Incorporate anchoring devices into the footing for use in tying down the conduits. Grade footings so that conduits maintain required pitch. Before installing spacers, levelers, and conduits, let concrete footings harden as required to prevent damage to the footings.
 - 1) Where conduits enter building or manhole wall, reinforce footings for 10 feet with No. 4 rods, 4 inches on center.
 - 2) Footings are not required for rigid ferrous metal conduit.
 - b. After rigid nonmetallic conduits have been laid on footing with spacers and levelers (located no more than 8 feet apart), tie conduits down to the footing, then surround the conduits by concrete not less than 2 inches thick on top and 2 inches on each side. Separate individual conduits a minimum of 3 inches so that each conduit is completely enveloped in concrete.
 - 1) Where conduits enter building or manhole walls, reinforce encasement for 10 feet with No. 4 rods, 4 inches on center.
 - 2) Encasement is not required for rigid ferrous metal conduit.
 - c. Form sides of the concrete encasement. Exception: Earth cuts will be permitted as the form where trenches are neatly excavated in stable soils.
- E. Jacking Conduits: Rigid ferrous metal conduit may be jacked under roads, parking lots, etc. Submit jacking details for approval.
- F. Conduits Entering Buildings and Manholes:
- 1. Seal conduit entrances into manholes watertight.
 - 2. Seal conduit entrances into building walls watertight. Exception: Seal is not required in below grade foundation walls associated with slab on grade construction.
 - 3. Install end bells at conduit entrances into manholes.
 - 4. Install end bells at conduit entrances into buildings. Exceptions:
 - a. Install insulated grounding bushing on conduit entrance stub up associated with slab on grade construction.
 - b. Install insulated grounding bushing and 2 locknuts on conduit where conduit is terminated in cabinet, junction or pull box.
- G. Cleaning Conduits: Take precautions to prevent foreign matter from entering conduits during installation. After installation clean conduits with tools designed for the purpose.
- H. Conduit for Future Use (Spare Conduit and Empty Conduit): Demonstrate to the Owner's Representative that conduits installed for future use are clear of obstructions (draw mandrel 1/2 inch less in diameter than conduit). Install a drag line in each conduit.
- I. Sealing Ends of Conduits:
- 1. Occupied Conduits: Seal ends of conduits to be used for Work of this contract until cables are to be installed. After cable installation, seal conduits at building entrances and first manhole outside building. Seal with duct seal.
 - 2. Conduits For Future Use: Seal the ends of spare and empty conduits at building entrances

and manholes. Seal with plastic plugs or a contrasting color cement/sand mixture.

- J. Using Existing Underground Conduits: Clean the conduits with tools designed for the purpose. The condition of conduits after cleaning may be determined with a mandrel 1/2 inch less in diameter than the conduit, with the sheath painted with black lacquer. Pull mandrel through conduit. Conduit is acceptable when there are no roller marks or scratches on the mandrel. Other methods may be used if approved. Report and demonstrate to the Director's Representative any defect found in the conduit system that cannot be eliminated. The Contractor is held responsible for any damage to cables resulting from imperfections in the conduit.
- K. Underground Warning Tape:
 - 1. Apply over all direct buried cable and underground conduit runs.
 - 2. Run tape parallel to, and 12" above, cable or conduit run centerline.
 - 3. Where ductbank exceeds 18" inches in width, provide additional tape runs 12" apart for each additional 12" in width.
- L. Cable Installation:
 - 1. Grounding: Provide an equipment ground conductor, sized per Contract Drawings or NFPA 70 (whichever is greater), in all new underground electric light and power cable runs. Do NOT rely on metallic conduits or cable armor to serve as equipment ground.
 - 2. Cable Pulling: Clean conduits prior to installation of cables as described herein. Do not exceed manufacturer's recommended maximum pulling tensions.
 - 3. Underground Cable Splices:
 - a. Underground cables splices shall be made only where called for on the drawings, cable taps, or where otherwise absolutely necessary. Pull through intermediate handholes/manholes.
 - b. Use only splice kits listed for underground use.
 - c. Splices shall be made in approved handholes / manholes only. Direct buried splices or splices pulled into conduits are NOT permitted.

3.03 CONDUIT SCHEDULE - TYPES AND USE

- A. Rigid Ferrous Metal Conduit: Install in all locations unless otherwise specified or indicated on the drawings.
- B. Rigid Nonmetallic Conduit (Concrete Encased): May be installed in all locations except:
 - 1. Where conduit stubs up or rises through slab or finished grade.
 - 2. Where other type raceways are specified or indicated on the drawings.
- C. Rigid Nonmetallic Conduit (Direct Buried) Schedule 80 PVC: May be Installed in all locations unless otherwise specified or indicated on the drawings.
- D. Rigid Nonmetallic Conduit (Direct Buried) Schedule 40 PVC: May be installed in unpaved areas when so specified in the drawings.

3.04 HANDHOLE INSTALLATION

- A. Do NOT install polymer concrete handholes in areas subject to deliberate vehicular traffic unless specifically rated and listed for this use.
- B. Handholes and boxes shall be set level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances. Provide box extension if required to match depths of duct, and seal joint between box and extension as recommended by manufacturer.
- C. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- D. In paved areas and trafficways, set cover flush with finished grade. Set covers of other handholes 1 inch above finished grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in enclosure.
- F. Field cut openings for duct according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.
- G. For enclosures installed in asphalt paving and subject to occasional, non-deliberate, heavy- vehicle loading, form and pour a concrete ring encircling, and in contact with, enclosure and with top surface screeded to top of box cover frame.
 - 1. Concrete: 3000 psi (20 kPa), 28-day strength, complying with Section 033000 "Cast-in- Place Concrete," with a troweled finish.
 - 2. Dimensions: 10 inches wide by 12 inches deep.

3.05 RESTORATION

- A. Backfill, compact and restore trench to final or existing grades as per Contract Drawings and as per Section 31000 – Earthwork.
- B. Seed// sod grassy areas as per Section 31000 – Earthwork.
- C. Where final grading and paving are NOT being performed by other trades:
 - 1. Restore all disturbed paving to match adjacent existing conditions or better.
 - 2. Restore disturbed concrete walk flags in their entirety. Match adjacent grades.
 - 3. Restore disturbed curbing to match adjacent curbing.
 - 4. Restore any disturbed traffic and paving markings.
 - 5. Paved areas shall be swept clean of all spoils and debris removed from site.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 260553 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. All sections of the project manual are directly applicable to this specification section. Should a conflict arise between specification sections or between specifications and drawings and/or code requirements, the contractor shall notify the Architect/Engineer of the conflict in writing. If direction is not provided prior to the submission of the bid, the contractor shall price the more extensive system.

1.02 SUMMARY

- A. Clearly and properly identify the complete electrical system to indicate the loads served or the function of each item of equipment connected under this work.

PART 2 – PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Comply with NFPA 70.
- B. Comply with 29 CFR 1910.144 and 29 CFR 1910.145 for danger, caution or safety instruction signs.
- C. Comply with ANSI Z535.4 for safety signs and labels.
- D. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

2.02 LABELS

- A. Pre-Printed: Permanent material pre-printed with black on white, with adhesive backing. Brady, 3M, or equal.
- B. Laminated Plastic: 3-ply laminated plastic, color as indicated, with 1/2-inch high white letters for low voltage. Lamicoid, or equal.
- C. Identification Plates: Engraved Phenolic/Lamacoid plastic, 1/16" thick, ASTM D 709 Type 1, black with white letters or white with black letters.
- D. Plastic Tape: Black or red with white letters, adhesive backing, field-printed with proper tool. Dymo-tape, or equal.
- E. Marker Tape: Clear adhesive-backed tape with black letters, for device plates. Kroy, or equal.

- F. Wire Markers: White with black numbers, adhesive-backed tape on dispenser roll. Brady, 3M, or equal.
- G. Marker Pen: Black permanent marker suitable for writing on metallic surfaces.

2.03 SIGNS

A. Baked-Enamel Signs:

1. Preprinted aluminum signs punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal Size: 7 by 10 inches.
4. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carlton Industries, LP
 - b. Champion America
 - c. Marking Services, Inc.
 - d. Approved Equal.

B. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:
 - a. For signs up to 20 sq. inches, minimum 1/16-inch.
 - b. For signs larger than 20 sq. inches, 1/8 inch thick.
 - c. Engraved legend with colors as indicated below by type of service:
 - 1) Normal Power – Black background with white letters.
 - 2) Standby Power- Blue background with white letters.
 - 3) Emergency/Life Safety Power- Red background with white letters.
 - 4) UPS/Clean Power – Gray background with white letters to read “UPS POWER” or “CLEAN POWER.”
 - d. Punched or drilled for mechanical fasteners.
 - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
3. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Brady Corporation
 - b. Carlton Industries, LP
 - c. Marking Services, Inc.
 - d. Approved Equal

2.04 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, #404 stainless-steel screws.

PART 2 – EXECUTION

3.01 GENERAL

- A. Prior to applying adhesive identification products, clean and prepare surfaces as recommended by manufacturer of identification product.
- B. Verify each item to be identified prior to application. Verify and coordinate all labelling information, colors etc. with the Drawings, Shop Drawings, manufacturer's wiring diagrams and manuals etc. and any special Owner labelling requirements. Labelling shall be consistent throughout Project.
- C. Install any labelling prior to installing acoustical ceilings or other concealment.
- D. Apply identification devices to surfaces that require finish after completion of finish work.
- E. Identification materials and devices shall not interfere with operation and maintenance of equipment.
- F. Attach signs and plastic labels that are not self-adhesive type with stainless steel mechanical fasteners appropriate to the location and substrate.
- G. Wraparound Marker Labels and Metal Tags shall be secured tight to surface of conductor or cable at a location with high visibility and accessibility.
- H. Labeling Instructions:
 - 1. Indoor Equipment: Non-ferrous metal or rigid plastic, stamped, embossed or engraved identification plates shall have white letters on black face or vice versa. Unless otherwise indicated, provide a single line of text with 1/8-inch- high letters on 1-1/2-inch- high label; where multiple lines of text are required, increase height accordingly.
 - 2. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
 - 3. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - 4. Labels not using self-adhesive attachment, shall be fastened using appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

3.02 IDENTIFICATION SCHEDULE

- A. General
 - 1. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Baked-enamel warning signs.
 - a. Comply with 29 CFR 1910.145.
 - b. Identify system voltage with black letters on an orange background.
 - c. Apply to exterior of door, cover, or other access.
 - d. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
 - 1) Power-transfer switches.
 - 2) Controls with external control power connections.

2. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
3. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.

B. Low Voltage Switchgear

1. Label each switchgear section with laminated plastic label indicating switchgear name and section per the drawings / shop drawings, ampere rating, voltage. Indicate source from switch switchboard is fed and feeder size on incoming feeder section.
2. Label all protective devices with laminated plastic labels indicating the function or the load served.
3. Provide laminated plastic labels for all bussed spaces indicating the maximum ampere rating or size of future breaker or switch that may be installed in the space reserved.

C. Branch Circuit and Power Distribution Panelboards:

1. Provide laminated plastic labels on panel exterior which indicate panel name per the drawings, voltage, source, from which the panel is fed with laminated plastic labels attached to face trim. Indicate feeder source, feeder wire size, and feeder breaker or fuse size with marker tape or marker pen on the inside of the panel door.
2. For new or modified panelboards, provide typewritten or software generated panel directories, with protective, clear transparent covers, accurately accounting for every breaker installed, including spares. Schedules shall use the actual loads and room designations assigned by name or number near completion of the work. Do not use the designations from the drawings.
3. For power distribution panelboards, where no directory is present, label each protective device with laminated plastic labels indicating load served. Marker pen is permitted where space does not permit laminated plastic labels.

D. Motor Control Centers:

1. Label all motor control centers with laminated plastic labels indicating control center name per the drawings.
2. Label all starters and breakers with factory-provided labels or laminated plastic labels indicating the function or the load served and location.
3. Provide pre-printed labels for all spaces.

E. Transformers:

1. Label all transformers with identification plate indicating equipment label per the drawings, KVA, primary and secondary voltages, source, and load served.

F. Disconnect Switches

1. Label All Disconnect Switches with laminated plastic labels indicating device name per the drawings, and with permanent marker, the source, load served, and internal fuse size, if applicable.

G. Miscellaneous Equipment

1. Label all motor start switches, individual circuit breakers, relays, contactors, time switches, and indicating equipment with marker tape or laminated plastic labels indicating equipment number, source, and circuit number.
2. Where the controlling device is remote mounted from the serving panel, include the serving panel designation and circuit number with additional plastic tape labels.

H. Receptacles

1. All receptacle plates shall be marked in marker tape on the face of the plate, with the receptacles panel and branch circuit designation. The identification shall be made with clear self-adhesive tape with black 10-point letters. Apply the tape at the top of the device plate.
2. Receptacles connected to a GFCI-protected circuit downstream from the protecting device shall be labeled "GFCI Protected."

I. Outlet, Pull, And Junction Boxes

1. For exposed and those above suspended ceilings, label covers of power junction boxes neatly by hand using permanent marker, indicating source and circuit number.
2. For exposed ceilings in occupied public spaces, where conduits, junction boxes, etc. are to be painted to blend into the ceiling, provide aforementioned labelling on the inside cover of the junction box.

J. Conduits

1. Label all exposed conduit runs in non-public spaces or accessible ceiling spaces with source panel and circuit number using neatly written permanent marker. Include destination in labelling for all feeder conduits. Space labels a maximum of 50 feet apart and at least one per room. Label conduits at entrances of all "J" boxes, distribution panels, MCC, panelboards, etc.
2. Omit labelling exposed conduits in occupied public spaces.

K. Emergency Lighting Fixtures:

1. Ceiling mounted and wall mounted emergency light which are equipped with integral emergency back-up battery or are tied into an emergency power system (emergency generator, remote inverter, etc.), shall be readily identified with a 3/4" dia. red circular adhesive label either on the fixture or on the ceiling grid surrounding the fixture.
2. Exceptions:
 - a. Twin head battery pack emergency unit fixtures and
 - b. Fixtures equipped with integral emergency battery with an indicator LED clearly visible without removing any lensing.

L. Special Systems (Fire Alarm, Security, Pa, Etc.): subject to the provisions of the respective specification section for each system:

1. Equipment Cabinets, Terminal Cabinets, Power Supply Cabinets, Control Panels, Patch Panels, Racks:
 - a. Provide identification plates with equipment identification as indicated on the drawings.

- b. Label termination blocks and ports.
2. Pullboxes, Enclosures, Junction Boxes:
- a. Provide identification plate including system type and location designation, if any, per the Drawings or Shop Drawings on cover.
 - b. Indicate equipment and location(s) from which enclosed cables originate.
3. Fire Alarm:
- a. Fire alarm junction boxes shall be red unless another standard is used by owner.
 - b. Initiation Devices, Notification Appliances, Fire Alarm Relays – Provide zone or address identification label, clear Marker Tape, red or black letters.
 - c. Remote Smoke Detector Lamps and Test Stations – Provide label indicating the location of the connected device.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 262213 – DRY-TYPE DISTRIBUTION TRANSFORMERS

PART 1 – GENERAL

1.01 SCOPE

- A. The Contractor shall furnish and install single-phase and three-phase general purpose individually mounted dry-type transformers of the two-windings type, self-cooled as specified herein, and as shown on the contract drawings.

1.02 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections apply to this Section.

1.03 REFERENCES

- A. The transformers and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of ANSI, NEMA and UL.
- B. Transformers shall meet the requirements of the most current version of Federal Law 10 CFR Part 431 "Energy Efficiency Program for Certain Commercial and Industrial Equipment".

1.04 SUBMITTALS – FOR REVIEW / APPROVAL

- A. The following information shall be submitted to the Engineer:
 - 1. Outline dimensions and weights
 - 2. Transformer ratings including:
 - a. kVA
 - b. Primary and secondary voltage
 - c. Taps
 - d. Basic impulse level (BIL) for equipment over 600 volts
 - e. Design impedance
 - f. Insulation class and temperature rise
 - g. Sound level.
 - h. Product data sheets

1.05 SUBMITTALS – FOR CONSTRUCTION

- A. The following information shall be submitted for record purposes.
 - 1. Final as-built drawings and information for items listed in Paragraph 1.04 and shall incorporate all changes made during the manufacturing process.
 - 2. Connection diagrams.
 - 3. Installation information.
 - 4. Seismic certification and equipment anchorage details as specified.

1.06 QUALIFICATIONS

- A. The manufacturer of the dry-type distribution transformers shall be the same as the manufacturer of the other major electrical distribution equipment on the project.
- B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.
- C. The manufacturer shall be a participant in the UL Data Acceptance Program (DAP) under the Client Test Data Program (CTDP) certification to ensure UL test methodologies and record traceability complies with the requirements of ISO 17025.
- D. Transformer must bear the UL Energy Efficiency Verification Mark to confirm that the unit meets the requirements of 10 CFR Part 431.
- E. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years.
- F. The transformers shall be suitable for and certified to meet all applicable seismic requirements of Uniform Building Code (UBC) for Zone 0 application for Long Island locations and Zone 2A application for other areas in eastern New York State. Guidelines for the installation consistent with these requirements shall be provided with the transformer and be based upon testing of representative equipment.

1.07 REGULATORY REQUIREMENTS

- A. All transformers shall be UL listed and bear the UL label.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.09 OPERATION AND MAINTENANCE MANUAL

- A. Equipment operation and maintenance manuals shall be provided with each assembly shipped and shall include instruction leaflets and instruction bulletins for the complete assembly and each major component.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Eaton
- B. General Electric
- C. Square D
- D. Approved Equal

2.02 RATINGS

- A. The kVA and voltage ratings shall be as indicated on the drawings.

- B. Transformers shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year operation, with normal life expectancy as defined in ANSI C57.96.
- C. Transformers shall meet the requirements of the most current version of federal law 10 CFR Part 431 "Energy Efficiency Program for Certain Commercial and Industrial Equipment".
- D. Transformers efficiency shall be measured according to federal law 10 CFR Part 431.
- E. Transformer sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings:

Equivalent Winding kVA Range	Self Cooled Ventilated		Self Cooled Sealed
	K-Factor=1 K-Factor=4 K-Factor=9	K-Factor=13 K-Factor=20	
3.00 and below	40	40	45
3.01 to 9.00	40	40	45
9.01 to 15.00	45	45	50
15.01 to 30.00	45	45	50
30.01 to 50.00	45	48	50
50.01 to 75.00	50	53	55
75.01 to 112.50	50	53	55
112.51 to 150.00	50	53	55
150.01 to 225.00	55	58	57
225.01 to 300.00	55	58	57
300.01 to 500.00	60	63	59
500.01 to 700.00	62	65	61
700.01 to 1000.00	64	67	63
Greater than 1000	Consult Factory	Consult Factory	Consult Factory

- F. Where K-factor transformers are indicated on the drawings, the transformers shall be specifically designed to supply circuits with a harmonic profile equal to or less than a K-factor of 4 without exceeding 150 degrees C temperature rise.

2.03 CONSTRUCTION – GENERAL PURPOSE TRANSFORMERS

A. Insulation Systems

1. Transformer insulation system shall be as follows:
 - a. Less than 15 kVA: 180 degrees C insulation system with 115 degree C rise, encapsulated design; 15 kVA and above: minimum of 220 degree C insulation system with 150 degree C rise, ventilated design.
2. Required performance shall be obtained without exceeding the above indicated temperature rise in a 40 degrees C maximum ambient, and a 24-hour average ambient of 30 degrees C.
3. All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

B. Core and Coil Assemblies

1. Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade aluminum with continuous wound construction.
2. On three-phase units rated 9 kVA and below and single-phase units rated 10 kVA and below the core and coil assembly shall be completely encapsulated in a proportioned mixture of epoxy or resin and aggregate to provide a moisture proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level.
3. On three-phase units rated 15 kVA and above and single-phase units rated 15 kVA and above the coils assembly shall be impregnated with non-hydroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture; the core shall be coated with HAPs (Hazardous Air Pollutants) free water reducible electrical varnish to give good corrosion resistance. The assembly shall be installed on vibration-absorbing pads.
4. Terminals shall be welded to the leads of the coils for better conductivity, less maintenance, and lower risk of hot spots. Terminals shall not be spot welded or bolted to the coil leads.

C. Taps

1. Three-phase transformers rated 15 through 225 kVA shall be provided with six 2-1/2% taps, two above and four below rated primary voltage. Three-phase transformers rated greater than 225 kVA shall be provided with manufacturer's standard taps for that rating.
2. All single-phase transformers, and three-phase transformers rated below 15 kVA and above 500 kVA, shall be provided with the manufacturer's standard tap configuration.

D. Electrostatic Shielding

1. Where shown on the drawings, provide shielded isolation transformers with an electrostatic shield consisting of a single turn of aluminum placed between the primary and secondary winding and grounded to the housing of the transformer.
 - a. Electrostatic shield shall provide primary to secondary winding capacitance between 24 and 18 picofarads over the range of 100 Hz to 20 kHz.
 - b. Electrostatic shielding shall provide the following minimum attenuation when tested per MIL-Std-220A, Method of Insertion Loss Measurement, with matched impedance no load technique:
 - 1) Common mode noise attenuation: Minus 80 dBA minimum at 0.1 kHz to 1.5 kHz; minus 55 dBA minimum at 1.51 kHz to 100 kHz. Normal mode (Transverse mode) noise attenuation: Minus 35dBA minimum at 1.5 kHz to 10 kHz.

E. Motor Drive Isolation

1. Where shown on the drawings, provide motor drive isolation transformers.
2. Motor drive isolation transformers shall be designed for use with three-phase ac adjustable frequency drives 600 volts and below to provide isolation between the incoming line and drive circuitry. These drives minimize the line disturbances caused by SCR firing within the drive unit. Thermoguards shall be included in all motor drive isolation transformers to provide

additional protection for the transformer from increased heating due to the non-sinusoidal characteristics of drive currents. The transformer shall provide reduced short-circuit currents and voltage line transients. The transformer shall be specifically sized to the drive kVA requirements dictated by the horsepower of the motor and, as such, will be mechanically braced to withstand the stress of current reversals and short-circuit currents associated with the specific drive kVA rating.

2.04 CONSTRUCTION – K-FACTOR TRANSFORMERS

A. Insulation Systems

1. Transformers shall be insulated with a UL recognized minimum 200 degrees C insulation system.
2. Required performance shall be obtained without exceeding the above indicated temperature rise in a 40 degrees C maximum ambient and a 24-hour average ambient of 30 degrees C.
3. All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.

B. Core and Coil Assemblies

1. Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade aluminum with continuous wound construction. The core shall provide reduced induced currents in the steel caused by the high ratios of peak-to-rms currents and voltages found in harmonic loads.
2. The neutral bus shall be configured to accommodate 200% of the rated current.
3. The coils assembly shall be impregnated with non-hygroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture; the core shall be coated with HAPs (Hazardous Air Pollutants) free water reducible electrical varnish to give good corrosion resistance. The assembly shall be installed on vibration-absorbing pads.

C. Taps

1. Three-phase K-factor rated transformers through 225 kVA shall be provided with six 2-1/2% taps, two above and four below rated primary voltage. Three-phase transformers rated greater than 225 kVA shall be provided with the manufacturer's standard taps for that rating.
2. Single-phase K-factor rated transformers shall be provided with manufacturer's standard tap configuration.

D. Electrostatic Shielding

1. Provide K-rated transformers with electrostatic shielding consisting of a single turn of aluminum placed between the primary and secondary winding and grounded to the housing of the transformer.
 - a. Electrostatic shield shall provide primary to secondary winding capacitance between 24 and 18 picofarads over the range of 100 Hz to 20 kHz.

- b. Electrostatic shielding shall provide the following minimum attenuation when tested per MIL-Std-220A, Method of Insertion Loss Measurement, with matched impedance no load technique:
- c. Common mode noise attenuation: Minus 80 dBA minimum at 0.1 kHz to 1.5 kHz; minus 55 dBA minimum at 1.51 kHz to 100 kHz. Normal mode (Transverse mode) noise attenuation: Minus 35dBA minimum at 1.5 kHz to 10 kHz.

2.05 CONSTRUCTION – HARMONIC MITIGATING TRANSFORMERS

A. Core and Coil Assemblies

1. Transformer core shall be constructed with high-grade, non-aging electrical steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed.
2. The coils assembly shall be impregnated with non-hydroscopic, thermosetting varnish and cured to reduce hot spots and seal out moisture; the core shall be coated with HAPs (Hazardous Air Pollutants) free water reducible electrical varnish to give good corrosion resistance. The internal core and coil assembly shall be installed on vibration-absorbing pads.
3. Transformers shall be of two-winding construction. The primary winding shall be a delta, three-wire connection and the secondary winding shall be wye-zigzag with a wye field connection.
4. Primary and secondary windings shall be wound of electrical grade aluminum with continuous wound construction. All terminals and bussing shall be aluminum.
5. Transformers shall be insulated with a UL recognized minimum 200 degrees C insulation system. Winding temperature rise shall not exceed 150 degrees C.
6. Required performance shall be obtained without exceeding the above indicated temperature rise in a 40 degrees C maximum ambient, and a 24-hour average ambient of 30 degrees C.
7. All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.
8. Neutral conductor shall be aluminum and rated to carry 200% of normal phase current.
9. Windings shall have a BIL of 10 KV.

B. Taps

1. Three-phase harmonic mitigating transformers rated 15 through 225 kVA shall be provided with six 2-1/2% taps, two above and four below rated primary voltage. Three-phase transformers rated greater than 225 kVA shall be provided with manufacturer's standard taps for that rating.

C. Electrostatic Shielding

1. Harmonic mitigating transformers shall be provided with an independent, single, full-width electrostatic shield consisting of a single turn of □[aluminum][copper] placed between each primary and secondary winding and grounded. [Option: double-shielding available]
 - a. Electrostatic shield shall provide primary to secondary winding capacitance between 24 and 18 picofarads over the range of 100 Hz to 20 kHz.

- b. Electrostatic shielding shall provide the following minimum attenuation when tested per MIL-Std-220A, Method of Insertion Loss Measurement, with matched impedance no load technique:
- c. Common mode noise attenuation: Minus 80 dBA minimum at 0.1 kHz to 1.5 kHz; minus 55 dBA minimum at 1.51 kHz to 100 kHz. Normal mode (Transverse mode) noise attenuation: Minus 35dBA minimum at 1.5 kHz to 10 kHz.

2.06 HARMONIC TREATMENT

- A. Harmonic Mitigating Transformers (HMTs) shall have a low Positive/Negative sequence impedance (between 4.6% and 7.2%) and low Zero-Sequence impedance/reactance (less than 0.55% and 0.47% respectively).
- B. Triplen harmonics shall be treated in the secondary windings through flux cancellation and not coupled into the primary delta winding.
- C. 5th and 7th harmonic currents shall be treated through the pairing of phase-shifted transformers such that these harmonic currents subtract at the common bus feeding the transformers with harmonics produced by other similar sources.
- D. Each of the transformers used to treat 5th and 7th harmonic currents shall also treat triplen harmonics in the secondary windings of each transformer.
- E. Fundamental current imbalance shall be reduced on the primary when compared to the secondary load measurements.
- F. Harmonic treatment shall be through electromagnetic means; filters, capacitors, power electronic circuitry or other such devices shall not be used to treat harmonics.
- G. Thermal Sensors
 - 1. When required, provide transformers with a thermal sensor set at 190 degrees C. Provide a second thermal sensor set at 175 degrees C when required. Thermal sensor(s) shall be factory-installed in the center coil of the transformer and factory-wired to a terminal strip. Thermal sensors shall consist of a set of dry contacts.

2.07 WIRING / TERMINATIONS

- A. Recommended external cable shall be rated 90 degrees C (sized at 75 degrees C ampacity) for encapsulated and 75 degrees C for ventilated designs. Connectors should be selected on the basis of the type and cable size used to wire the specific transformer.

2.08 ENCLOSURE

- A. The enclosure shall be made of heavy-gauge steel. All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring. The maximum temperature of the enclosure shall not exceed 90 degrees C per UL requirement. The core of the transformer shall be grounded to the enclosure.
- B. On three-phase units rated 9 kVA and below and single-phase units rated 10 kVA and below the enclosure construction shall be encapsulated, totally enclosed, non-ventilated, NEMA 3R, with lifting provisions.
- C. On three-phase units rated 15 kVA and above and single-phase units rated 15 kVA and above the enclosure construction shall be ventilated, NEMA 2, drip-proof, with lifting provisions. All ventilation

openings shall be protected against falling dirt. On outdoor units, provide weathershields over ventilated openings.

- D. Ventilated type transformers that meet 10 CFR Part 431 efficiency requirements, with a core size of 150 kVA or less, shall be suitable for installation with 2-inch clearance from a wall or other obstruction behind the transformer enclosure.

2.09 FINISH

- A. Steel enclosures shall be finished with ANSI 61 color, weather-resistant enamel. Stainless steel enclosures shall not be painted.

2.10 OPTIONAL ACCESSORIES

- A. On ventilated outdoor units provide suitable weathershields over ventilation openings.

PART 3 – EXECUTION

3.01 FACTORY TESTING

- A. The following standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of ANSI and NEMA standards.
 - 1. Ratio tests at the rated voltage connection and at all tap connections.
 - 2. Polarity and phase relation tests on the rated voltage connection.
 - 3. Applied potential tests.
 - 4. Induced potential test.
 - 5. No-load and excitation current at rated voltage on the rated voltage connection.

3.02 INSTALLATION

- A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.

3.03 FIELD ADJUSTMENTS

- A. Adjust taps to deliver appropriate secondary voltage.

3.04 FIELD TESTING

- A. Measure primary and secondary voltages for proper tap settings.

END OF SECTION

DIVISION 26 – ELECTRICAL
SECTION 262416 – PANELBOARDS

PART 1 – GENERAL

1.01 SCOPE

- A. The Contractor shall furnish and install the panelboards as specified and as shown on the contract drawings.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 260500 – Common Work Results for Electrical
- C. Section 260553 – Identification for Electrical Systems

1.03 REFERENCES

- A. The panelboards and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of NEMA and UL as follows:
 - 1. UL 67 – Panelboards
 - 2. UL 50 – Cabinets and boxes
 - 3. NEMA PB1
 - 4. Fed. Spec. W-P-115C
 - 5. UL98 – Fusible Switches

1.04 SUBMITTALS – FOR REVIEW / APPROVAL

- A. The following information shall be submitted to the Engineer for each panelboard:
 - 1. Breaker layout drawing with dimensions indicated and nameplate designation.
 - 2. Component list
 - 3. Conduit entry/exit locations
 - 4. Assembly ratings including:
 - a. Short-circuit rating
 - b. Voltage
 - c. Continuous current
 - 5. Cable terminal sizes
 - 6. Product data sheets

1.05 SUBMITTALS – FOR CONSTRUCTION

- A. The following information shall be submitted for record purposes:
- B. Final as-built drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process.
- C. Installation information

1.06 QUALIFICATIONS

- A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.
- B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.07 REGULATORY REQUIREMENTS

- A. Panelboard overcurrent protective devices shall be selectively coordinated with all supply side overcurrent protective devices as required for this project by the National Electrical Code/NFPA 70 Articles 645.27, 700.27, 701.27 and 708.54.
- B. The panelboards and components shall be UL labeled.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.09 OPERATION AND MAINTENANCE MANUAL

- A. Equipment operation and maintenance manuals shall be provided with each assembly shipped and shall include instruction leaflets, instruction bulletins and renewal parts lists where applicable, for the complete assembly and each major component.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Subject to requirements, provide product by one of the following:
 - 1. Eaton
 - 2. Siemens
 - 3. General Electric
 - 4. Square D
 - 5. Approved Equal
 - a. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety. Ratings.
- B. Panelboards rated 240 Vac or less shall have short-circuit ratings as shown on the drawings or panelboard schedules, but not less than 22,000 amperes RMS symmetrical.
- C. Panelboards rated 480 Vac shall have short-circuit ratings as shown on the drawings or panelboard schedules, but not less than 14,000 amperes RMS symmetrical.
- D. Panelboards shall be labeled with a UL short-circuit rating. Series rated panelboards shall be provided with a label or manual stating the conditions of the UL series ratings. Information in the manual shall include, at minimum:

1. Size and type of upstream device
2. Branch devices that can be used
3. UL tested and listed series short-circuit rating.

2.02 CONSTRUCTION

- A. Interiors shall be completely factory assembled. They shall be designed such that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors.
- B. Trims for branch circuit panelboards shall be supplied with a hinged door over all circuit breaker handles. Doors in panelboard trims shall not uncover any live parts. Doors shall have a semi flush cylinder lock and catch assembly. Door-in-door trim shall be provided. Both hinged trim and trim door shall utilize three-point latching. No tools shall be required to install or remove trim. Trim shall be equipped with a door-actuated trim locking tab. Equip locking tab with provision for a screw such that removal of trim requires a tool, at the owner's option. Installation shall be tamper resistant with no exposed hardware on the panelboard trim.
- C. Distribution panelboard trims shall cover all live parts. Switching device handles shall be accessible.
- D. Surface trims shall be same height and width as box. Flush trims shall overlap the box by 3/4 of an inch on all sides.
- E. A directory card with a clear plastic cover shall be supplied and mounted on the inside of each door.
- F. All locks shall be keyed alike.

2.03 BUS

- A. Main bus bars shall be tin-plated copper sized in accordance with UL standards to limit temperature rise on any current carrying part to a maximum of 65 degrees C above an ambient of 40 degrees C maximum.
- B. A system ground bus shall be included in all panels.
- C. Full-size (100%-rated) insulated stand-off neutral bars shall be included for panelboards shown with neutral. Bus bar taps for panels with single-pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral busing shall have a suitable lug for each outgoing feeder requiring a neutral connection. 200%-rated neutrals shall be supplied for panels designated on drawings with oversized neutral conductors.

2.04 BRANCH CIRCUIT PANELBOARDS – CIRCUIT BREAKER

- A. The minimum short-circuit rating for branch circuit panelboards shall be 10,000 amperes symmetrical at 240 volts, and 14,000 amperes symmetrical at 480 volts, or as indicated on the drawings. Panelboards shall be fully rated. Panelboards shall be Eaton type Pow-R-Line 1a, Pow-R-Line 2a or Pow-R-Line 3a or approved equal.
- B. Bolt-on type, heavy-duty, quick-make, quick-break, single- and multi-pole circuit breakers of the types specified herein, shall be provided for each circuit with toggle handles that indicate when unit has tripped.
- C. All circuit breakers shall be thermal-magnetic type with common handle for all multiple pole circuit breakers. Circuit breakers shall be minimum 100-ampere frame. Ratings through 100-ampere trip shall take up the same pole spacing. Circuit breakers shall be UL listed as type SWD for lighting circuits.

- D. Circuit breaker handle locks (ON position) shall be provided for all circuits that supply exit signs, emergency lights, energy management, and control system (EMCS) panels and fire alarm panels.

2.05 BRANCH CIRCUIT PANELBOARDS – FUSIBLE

- A. The minimum short-circuit rating for branch circuit panelboards shall be as specified herein or as indicated on the drawings. Panelboards shall be fully rated. Panelboards shall be Eaton type Pow-R-Line 3FQS, Bussman Type QSCP, or engineer approved equal.
- B. Panelboard shall have an integrated spare fuse compartment for up to (6) spare CUBE fuses as standard.
- C. Branch circuit disconnecting means shall be bolt-on Bussmann Type CCPB with Bussmann Low-Peak CUBE fuses or approved equal utilized for overcurrent protection. Ratings shall be available from 15-100A with minimum interrupting rating of 300kA symmetrical and 200kA short circuit current assembly rating.
- D. Branch circuit devices shall include a non-defeatable interlock to prevent removal of fuse under load. Provide a fuse ampacity rejection feature to prevent over fusing of branch disconnect. Fuses shall be indicating type with permanently installed neon indicating light. Branch devices shall be finger-safe when panelboard trim is removed. Provide lockout/tagout provision for each branch circuit position.

2.06 DISTRIBUTION PANELBOARDS – CIRCUIT BREAKER TYPE

- A. Distribution panelboards equipped with bolt-on devices shall have interrupting ratings as indicated on the drawings. Panelboards shall be fully rated. Panelboards shall be Eaton type Pow-R-Line 3a or Pow-R-Line 4B or approved equal. Panelboards shall have molded case circuit breakers as indicated below.
- B. Where indicated, provide circuit breakers UL listed for application at 100% of their continuous ampere rating in their intended enclosure.
- C. Main breakers, if furnished, shall be equipped with microprocessor-based trip units that have integral Arc Flash Reduction trip feature. The use of zone selective interlocking to emulate this function does not meet the intent of this specification and will not be allowed.
- D. Distribution circuit breakers shall be fixed mounted type and equipped with either microprocessor-based trip units or thermal magnetic trip units as scheduled on the contract drawings.
- E. Provide shunt trips, bell alarms, and auxiliary switches as shown on the contract drawings.

2.07 DISTRIBUTION PANELBOARDS – FUSIBLE SWITCH TYPE

- A. Distribution panelboards shall be equipped with main and branch fusible switches and include fuses with ratings indicated on the drawings. Fusible distribution panelboards shall be Eaton type Pow-R-Line 4F or approved equal.

2.08 PANELBOARD SUBMETERING

- A. Where shown on the drawings, supply a UL listed microprocessor-based Multi-Point Metering System (MPM), Eaton type PX Multipoint Meter or approved equal having the specified features.
- B. MPM shall have 60 channels for current sensor input. Meter shall auto-detect sensor rating and have standard tamper detection.

- C. MPM shall calculate power and energy consumption in accordance with ANSI C12.20 (0.5%) metering specification and store metered data in nonvolatile memory.
- D. MPM shall store the following per phase and system total for each metering point.
 - 1. Voltage, Current, and Frequency (system total only)
 - 2. Watts, VAR, VA, and power factor
 - 3. Watt hours including forward and reverse.
- E. MPM shall store energy profile information for each metering point in non-volatile memory. The demand profile time period shall be adjustable from 1, 5, 15, 30 and 60 minutes for fixed method and 1, 5, and 15 minutes for sliding method. The MPM shall have the ability to sync with external input to the on-board demand input. The MPM shall be able to save a minimum of 1 year of load profile data for all 60 meter points on a 15 minutes basis.
- F. MPM shall be provided with multiple communications ports and protocols, including the following capability:
 - 1. RS-485 remote display port
 - 2. RS-485 Modbus RTU
 - 3. USB Local Configuration Port
 - 4. HTML web pages
 - 5. File transfer protocol (ftp)
 - 6. RJ-45 10/100Base-T Ethernet network port
 - 7. Modbus TCP
 - 8. BACnet/IP
 - 9. SMTP(Simple Mail Transfer Protocol) for email support
 - 10. SNMP(Simple Network Management Protocol) MIB support
 - 11. Ethernet TCP/IP
 - 12. NTP(Network Time Protocol) support

2.09 SURGE PROTECTION DEVICES

- A. SPD shall comply with ANSI/UL 1449 4th Edition or later listing by Underwriters Laboratories (UL).
- B. SPD shall be factory installed integral to the panelboard by the original equipment manufacturer and shall be a product of the same manufacturer as the panelboard and breakers.
- C. The SPD shall be maintenance free and shall not require any user intervention throughout its life. SPDs containing items such as replaceable single-mode modules, replaceable fuses, or replaceable batteries shall not be accepted. SPDs requiring any maintenance of any sort such as periodic tightening of connections shall not be accepted. SPDs requiring user intervention to test the unit via a diagnostic test kit or similar device shall not be accepted.
- D. Electrical Requirements:
 - 1. Unit Operating Voltage – Refer to drawings for operating voltage and unit configuration.
 - 2. Maximum Continuous Operating Voltage (MCOV) – The MCOV shall not be less than 115% of the nominal system operating voltage.
 - 3. The suppression system shall incorporate thermally protected metal-oxide varistors (MOVs) as the core surge suppression component for the service entrance and all other distribution levels. The system shall not utilize silicon avalanche diodes, selenium cells, air gaps, or other components that may crowbar the system voltage leading to system upset or create any

environmental hazards. End of life mode to be open circuit. Unit with end of life short-circuit mode are not acceptable.

4. Unit shall operate without the need for an external overcurrent protection device (OCPD) and be listed by UL as such. Unit must not require external OCPD or replaceable internal OCPD for the UL Listing.
5. Protection Modes – The SPD must protect all modes of the electrical system being utilized. The required protection modes are indicated by bullets in the following table:

Configuration	Protection Modes			
	L-N	L-G	L-L	N-G
Wye	•	•	•	•
Delta	N/A	•	•	N/A
Single Split Phase	•	•	•	•
High Leg Delta	•	•	•	•

6. Nominal Discharge Current (In) – All SPDs applied to the distribution system shall have a 20kA In rating regardless of their SPD Type (includes Types 1 and 2) or operating voltage. SPDs having an In less than 20kA shall be rejected.
7. ANSI/UL 1449 4th Edition Voltage Protection Rating (VPR) – The maximum ANSI/UL 1449 4th Edition VPR for the device shall not exceed the following:

Modes	208Y/120	480Y/277	600Y/347
L-N; L-G; N-G	700	1200	1500
L-L	1200	2000	3000

2.10 ENCLOSURE

- A. Enclosures shall be at least 20 inches wide made from galvanized steel. Provide minimum gutter space in accordance with the National Electrical Code. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space. At least four interior mounting studs with adjustable nuts shall be provided.
- B. Enclosures shall be provided with blank ends.
- C. Where indicated on the drawings, branch circuit panelboards shall be column width type.

2.11 NAMEPLATES

- A. Provide an engraved nameplate for each panel section as per Specification Section 260553.

2.12 FINISH

- A. Surfaces of the trim assembly shall be properly cleaned, primed, and a finish coat of gray ANSI 61 paint applied.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.
- B. Provide typed directory for each panelboard.

END OF SECTION

DIVISION 26 – ELECTRICAL
SECTION 262726 – WIRING DEVICES

PART 1 – GENERAL

1.01 SCOPE

- A. The Contractor shall furnish and install, where indicated, wiring devices, complete with backboxes and wallplates as specified herein, and as shown on the contract drawings.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 260500 – Basic Electrical Requirements
- C. Section 260532 – Interior Raceways Fittings and Accessories
- D. Section 260534 – Outlet, Junction and Pull Boxes

1.03 SUMMARY

- A. Section Includes:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. Receptacles with integral USB charger.
 - 3. Receptacles with integral Arc Fault Circuit Interrupter, AFCI.
 - 4. Plugload Control Receptacles.
 - 5. Twist-locking receptacles.
 - 6. Receptacles with integral surge-suppression units.
 - 7. Isolated-ground receptacles.
 - 8. Hospital-grade receptacles.
 - 9. Tamper-resistant receptacles.
 - 10. Weather-resistant receptacles.
 - 11. Snap switches and wall-box dimmers.
 - 12. Wall-switch and exterior occupancy sensors.
 - 13. Communications outlets.
 - 14. Pendant cord-connector devices.
 - 15. Cord and plug sets.
 - 16. Floor service outlets, poke-through assemblies, service poles, and multioutlet assemblies.

1.04 DEFINITIONS

- A. AFCI: Arc fault circuit interrupter.
- B. EMI: Electromagnetic interference.
- C. GFCI: Ground-fault circuit interrupter.
- D. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- E. Plugload Control Receptacle: Automatically occupancy switched receptacle.
- F. RFI: Radio-frequency interference.
- G. TVSS: Transient voltage surge suppressor.
- H. UTP: Unshielded twisted pair.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:

1. Receptacles for Owner-Furnished Equipment: Match plug configurations.
2. Cord and Plug Sets: Match equipment requirements.

1.06 ACTION SUBMITTALS

- A. Product Data: Manufacturer's standard catalog cut, highlighted for each type of product used.
- B. Samples: One for each type of device and wall plate specified, in each color specified when so indicated on the drawings or requested by the Architect/Engineer.

1.07 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.08 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. None unless otherwise specified on the drawings.

1.09 QUALITY ASSURANCE

- A. Electrical components, conductors, devices and accessories described herein shall be listed and labeled as defined by NFPA 70 by a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories (UL), for the intended use and shall bear its label.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Hubbell Incorporated; Wiring Device-Kellems; Wiring Device-Kellems (Hubbell) or a comparable product by one of the following:
 1. Arrowhart Wiring Devices, Inc.; Division of Eaton.
 2. Leviton Manufacturing Co., Inc.
 3. Pass & Seymour/Legrand (Pass & Seymour).
 4. Approved equal.
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.02 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Devices that are manufactured for use with modular plug-in connectors shall NOT be used unless otherwise specifically indicated in the drawings.

2.03 STRAIGHT-BLADE RECEPTACLES

A. Convenience Receptacles:

1. Requirements: Heavy Duty 125 V, 20A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
2. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; HBL5361 (single), HBL5362 (duplex) (Design Basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton; 5361 (single), AH 5362 (duplex).
 - c. Leviton Manufacturing Co., Inc.; 5361 (single), 5362 (duplex).
 - d. Pass & Seymour/Legrand (Pass & Seymour); 5361 (single), 5362 (duplex).
 - e. Approved Equal.

B. USB Charging Convenience Receptacles:

1. Requirements: Tamper Resistant, 125 V, 20A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 1310, and FS W-C-596. Compatible with USB 1.1/2.0/3/0 devices, including Apple products.
2. Subject to compliance with requirements, provide duplex receptacle with 2 USB charging Ports or a comparable product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; USB 20X2 (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton, TR7756.
 - c. Leviton Manufacturing Co., Inc. T5832
 - d. Pass & Seymour/Legrand (Pass & Seymour) TR5362USB.
 - e. Approved Equal

C. Arc Fault Convenience Receptacles:

1. Requirements: 125 V, 20A: tamper resistant. Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
2. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; AFR20TR (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton. TRAFCI20
 - c. Leviton Manufacturing Co., Inc. AGTR2
 - d. Pass & Seymour/Legrand (Pass & Seymour), AFR202
 - e. Approved Equal

D. Arc Fault / Ground Fault Dual Function Convenience Receptacles:

1. Requirements: 125 V, 20A, tamper resistant, Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 943, UL 498, and FS W-C-596.
2. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; AFGF20TR (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton. TRAFCI20
 - c. Leviton Manufacturing Co., Inc. AFTR2
 - d. Pass & Seymour/Legrand (Pass & Seymour), AFGFR202TR
 - e. Approved Equal

E. Plugload Controlled Convenience Receptacles:

1. Requirements: 125 V, 20A, permanent controlled face marking: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
2. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; one controlled face BR20C1, or two controlled faces, BR20C2 (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton, 5362CH (one face), 5362CD (2-faces)
 - c. Leviton Manufacturing Co., Inc. 5362-S1(one face) or 5362-S2 (two faces)
 - d. Pass & Seymour/Legrand (Pass & Seymour).5362CH (1-face) or 5362CD (2-faces)
 - e. Approved Equal.

F. Isolated-Ground, Duplex Convenience Receptacles:

1. Description: Straight blade; equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.
2. Requirements: 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.
3. Subject to compliance with requirements, provide or a comparable product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; IG5362 (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton; IG 5362.
 - c. Leviton Manufacturing Co., Inc.; 5362IG.
 - d. Pass & Seymour/Legrand (Pass & Seymour); IG5362.
 - e. Approved Equal.

G. Tamper-Resistant Convenience Receptacles:

1. Requirements: 125 V, 20 A: Comply with NEMA WD1, NEMA WD6 Configuration 5-20R, UL 498 Supplements, and FSW-C-596.
2. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Wiring Device - Kellems; HBL5362TR (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton; TRBR20.
 - c. Leviton Manufacturing Co., Inc.; TBR20.
 - d. Pass & Seymour/Legrand (Pass & Seymour); TR63.
 - e. Approved equal.

2.04 GFCI RECEPTACLES

A. Description:

1. Straight blade, non-feed-through type unless otherwise specified in the drawings.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
3. Self-test function, line / load reversal protection.

4. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.
5. Extra heavy duty, weather and tamper resistant.
6. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
7. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; GFR5632TR (design basis).
 - b. Cooper Wiring Devices, Inc.; Division of Eaton; VGF20.
 - c. Leviton Manufacturing Co., Inc.; 7899.
 - d. Pass & Seymour/Legrand (Pass & Seymour); 2099.
 - e. Approved Equal

2.05 RETRACTABLE CORD REELS

A. General Requirements:

1. Comply with NEMA WD 1, UL 20, and FS W-S-896.
2. Switches, 120/277 V, 20 A, 1HP @ 120V, 2HP @ 240V:

B. Description:

1. Steel construction including mounting base, 20A, 125VAC, NEMA 2 positive latching mechanism, minimum 5' long input power cord and plug, adjustable guide arm, 25'L minimum 12/3 power cord.
2. UL 355 listed / certified.
3. Provide with double duplex GFCI straight blade receptacles on the payout end. Exception – Integral GFCI protection not required where upstream GFCI protection is provided by a GFCI branch circuit breaker or other device.
4. Unless otherwise noted in the drawings provide safety yellow color when used in shop classrooms, white when used in Science lab or Family/Consumer Science classrooms.
5. Provide with swivel base.
6. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; HBL45123 Series (design basis)
 - b. KH Industries RTB3L Series.
 - c. Approved equal.

2.06 CORD AND PLUG SETS

A. Description:

1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.

3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.07 TOGGLE SWITCHES

A. General Requirements:

1. Comply with NEMA WD 1, UL 20, and FS W-S-896.
2. Switches, 120/277 V, 20 A, 1HP @ 120V, 2HP @ 240V:

B. Single Pole:

1. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; 1221 (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton, Inc.; AH 1221.
 - c. Leviton Manufacturing Co., Inc.; 1221-2.
 - d. Pass & Seymour/Legrand (Pass & Seymour); PS20AC1.
 - e. Approved equal.

C. Double Pole:

1. Subject to compliance with requirements, provide or a comparable product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; 1222 (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton, Inc.; AH1222.
 - c. Leviton Manufacturing Co., Inc.; 1222-2.
 - d. Pass & Seymour/Legrand (Pass & Seymour); PS20AC2.
 - e. Approved equal.

D. Three Way:

1. Subject to compliance with requirements, provide or a comparable product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; 1223 (design basis)
 - b. Arrow Hart Devices, Inc.; Division of Eaton.; AH1223.
 - c. Leviton Manufacturing Co., Inc.; 1223-2.
 - d. Pass & Seymour/Legrand (Pass & Seymour); PS20AC3.
 - e. Approved equal.

E. Four Way:

1. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; 1224 (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Easton.; AH1224.
 - c. Leviton Manufacturing Co., Inc.; 1224-2.
 - d. Pass & Seymour/Legrand (Pass & Seymour); PS20AC4.
 - e. Approved equal.

F. Pilot-Light Switches:

1. Description: Single pole, with neon-lighted handle, illuminated when switch is "off.

2. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; 1221-PL for 120 and 277 V
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton.; AH1221-PL (120 ad 277 V).
 - c. Leviton Manufacturing Co., Inc.; 1221-PLR (120V) or 1221-7PLR (277V).
 - d. Pass & Seymour/Legrand (Pass & Seymour); PS20AC1RPL (120V) or PS20AC1RPL7 (277V).
 - e. Approved equal.
- G. Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches: 120/277 V, 20 A; for use with mechanically held lighting contactors.
1. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; HBL1557 (design basis)
 - b. Arrow Hart Devices, Inc.; Division of Eaton.; 1995.
 - c. Leviton Manufacturing Co., Inc.; 1257.
 - d. Pass & Seymour/Legrand (Pass & Seymour); 1251.
 - e. Approved equal.

2.08 KEY-OPERATED SWITCHES, 120/277 V, 20 A

A. General Requirements:

1. Comply with NEMA WD 1, UL 20, and FS W-S-896.
2. Switches, 120/277 V, 20 A, 1HP @ 120V, 2HP @ 240V.
3. Single Pole, with factory-supplied key in lieu of switch handle.

B. Single Pole:

1. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; 1221L (design basis)
 - b. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.; AH1221L.
 - c. Leviton Manufacturing Co., Inc.; 1221-2L.
 - d. Pass & Seymour/Legrand (Pass & Seymour); PS20AC1-L.
 - e. Approved equal.

C. Key-Operated, Single-Pole, Double-Throw, Momentary-Contact, Center-off Switches: 120/277 V, 20 A; for use with mechanically held lighting contactors, with factory-supplied key in lieu of switch handle.

1. Subject to compliance with requirements, provide product by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; HBL1557L (design basis)
 - b. Arrow Hart Wiring Devices, Inc.; Division of Eaton.; 1995L.
 - c. Leviton Manufacturing Co., Inc.; 1257L.
 - d. Pass & Seymour/Legrand (Pass & Seymour); 1251L.
 - e. Approved equal.

2.09 WALL-BOX DIMMERS

- A. Shall be compatible with lighting type used. Coordinate with drawings and lighting specification divisions.

2.10 WALL PLATES

- A. Single and combination types shall match corresponding wiring device style. Multi-gang installations shall be installed under a single piece wall plate.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: Type 302 stainless steel, 0.04-inch thick, brushed brass with factory polymer finish.
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, listed and labeled for use in wet and damp locations.
 - 5. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.11 FLOOR SERVICE FITTINGS

- A. Floor Service assemblies specified herein shall be for power use only. For assemblies containing data communications or combination power and data communications refer to technology drawings and specification sections for applicable products.
- B. Type: Modular, flush-type, flap-type, above-floor, single-service units suitable for wiring method used as indicated in the drawings.
- C. Compartments: Barrier separates power from voice and data communication cabling.
- D. Service Plate: Rectangular or Round as indicated, finish die-cast aluminum finish with satin finish, unless otherwise indicated.
- E. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.

2.12 POKE-THROUGH ASSEMBLIES

- A. Poke-Through assemblies specified herein shall be for power use only. For assemblies containing data communications or combination power and data communications refer to technology drawings and specification sections for applicable products.
- B. Where not otherwise indicated on the drawings, subject to compliance with requirements, provide Hubbell Incorporated; Wiring Device-Kellems; products named below or a comparable product by one of the following:
 - 1. FSR.
 - 2. Wiremold / Legrand.
 - 3. Approved equal.
- C. Activation Type:
 - 1. Recessed Activation.
 - a. Hubbell System One - Recessed Activation or approved equal.
 - 1) S1R4PT: 4-inch core with two 1/2 inch and one 3/4 inch feed conduits.
 - 2) Outlets: S1R4PTQUAD: Power only, with four power outlets.

b. Provide with appropriate subplate for device mounting and cover, finish chosen by Architect.

- 1) Cover Flange: 0.12 inch thick, ADA compliant.
- 2) Finish: As specified by Architect.

D. Surface Activation.

1. Hubbell System One - Surface Activation or approved equal:
 - a. S1PT4X4FIT with two 3/4 inch conduits for low voltage, one 3/4 inch for power.
2. Provide with appropriate subplate for device mounting and cover, finish chosen by Architect.
3. Cover Flange: ADA compliant appropriate for use in the floor finish installed.
4. Furniture Feed Cover: S1PFFT for tile applications or S1PFF for carpet applications as appropriate with one 3/4 inch connection for power and one 1-1/2 inch connection for low voltage.
 - a. Finish: As specified by Architect.

E. Pedestal Activation.

1. PT7XC, 2-inch poke through insert with a RX80 series pedestal, size as required or approved equal.

F. Description:

1. Factory-fabricated and -wired assembly of below-floor junction box with multi-channeled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.
2. Comply with UL 514 scrub water exclusion requirements.
3. Service-Outlet Assembly: As indicated on the plans."
4. Size: Selected to fit cored holes in floor and matched to floor thickness.
5. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.
6. Closure Plug: Arranged to close unused cored openings and reestablish fire rating of floor.
7. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors

2.13 PREFABRICATED MULTIOUTLET ASSEMBLIES

- A. Unless otherwise noted in the drawings, Subject to compliance with requirements, provide 20A, 120V by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems; Plug TrakHBL24 series steel.
 - b. Wiremold / Legrand.
 - c. Approved equal.
- B. Two-piece surface painted steel brushed aluminum or PVC raceway, with factory-wired multi-outlet harness.

- C. Components shall be products from single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.
- D. Raceway Material: Painted Metal for general use. PVC where subject to corrosive conditions.
- E. Multi-outlet Harness:
 - 1. Receptacles: 20 A, 125-V, NEMA WD 6 Configuration 5-20R receptacles complying with NEMA WD 1, UL 498, and FS W-C-596.
 - 2. Receptacle Spacing: 12 inches, unless otherwise indicated.
 - 3. Wiring: No. 12 AWG solid, Type THHN copper, single circuit.

2.14 SERVICE POLES

- A. Subject to compliance with requirements, provide service poles or comparable product by one of the following:
 - 1. Hubbell Wiring Device Kellems; HBL PP series (design basis).__
 - 2. MonoSystems.
 - 3. Legrand / Wiremold.
 - 4. Approved equal.
- B. Description:
 - 1. Factory-assembled and -wired units to extend power and voice and data communication from distribution wiring concealed in ceiling to devices or outlets in pole near floor.
 - 2. Poles: Nominal 2.5-inch- square cross section, with height adequate to extend from floor to at least 6 inches above ceiling, and with separate channels for power wiring and voice and data communication cabling.
 - 3. Mounting: Ceiling trim flange with concealed bracing arranged for positive connection to ceiling supports; with pole foot and carpet pad attachment.
 - 4. Material and Finish: Painted steel.
 - 5. Wiring: Sized for minimum of five No. 12 AWG power and ground conductors and a minimum of four, four-pair, Category 3 or Category 5 voice and data communication cables.
 - 6. Power Receptacles: Two duplex, 20-A, straight-blade receptacles complying with requirements in this Section.
 - 7. Voice and Data Communication Outlets: complying with requirements in Division 27.

2.15 FINISHES

- A. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: Brown unless otherwise indicated or required by NFPA 70 or device listing. Exceptions – a) In offices, Libraries, Cafeterias, etc., color as specified by Architect, b) In partially renovated rooms - match existing devices to remain.
 - 2. Wiring Devices Connected to Emergency / Standby Power System: Red.

3. TVSS Devices: Blue.
 4. Isolated-Ground Receptacles: White, with orange triangle on face.
 5. Controlled Receptacles – Green (where available) or where not available, other color differing from general use receptacles in the area.
- B. Wall Plate Color: See “Wallplates” above. For plastic covers, match device color.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. See plans for device mounting heights. Otherwise, comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 4. Existing Conductors:
 - a. Cut back and pigtail or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailling existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
1. Install devices flush and level.
 2. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 3. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.

4. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
5. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
6. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
7. Use a torque screwdriver when a torque is recommended or required by manufacturer.
8. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
9. Tighten unused terminal screws on the device.
10. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
11. Receptacles shall have a bonding conductor from the grounding terminal to the metal conduit system. Self-grounding receptacles using mounting screws as bonding means are not acceptable.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to left.

F. Wall Switches:

1. Install wall switches with OFF position down.

G. Device Plates:

1. Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
2. Install device plates flush and level.

H. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.
4. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on bottom. Group adjacent switches under single, multi-gang wall plates.
5. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.02 GFCI RECEPTACLES

- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.03 IDENTIFICATION

- A. Comply with Section 260553 – Identification for Electrical Systems.
- B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.04 FIELD QUALITY CONTROL

- A. Tests for Wiring Devices:
 - 1. Inspect each wiring device for defects.
 - 2. Verify each receptacle device is energized. Acceptable line voltage range is 105 to 132 V.
 - 3. Test each receptacle for proper polarity. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. Operate each wall switch and wall dimmer with circuit energized and verify proper operation.
 - 7. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- B. Wiring device will be considered defective if it does not pass tests and inspections.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 262816 – HEAVY DUTY SAFETY SWITCHES

PART 1 – GENERAL

1.01 SCOPE

- A. The Contractor shall furnish and install the low-voltage fused and non-fused switches as specified herein and as shown on the contract drawings.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 260500 – Common Work Results for Electrical
- C. Section 260553 – Identification for Electrical Systems

1.03 REFERENCES

- A. The switches and all components shall be designed, manufactured, and tested in accordance with the latest applicable standards:
 - 1. NEMA KS-1
 - 2. UL 98

1.04 SUBMITTALS – FOR REVIEW / APPROVAL

- A. The following information shall be submitted to the Engineer:
 - 1. Dimensioned outline drawing
 - 2. Conduit entry/exit locations
 - 3. Switch ratings including:
 - a. Short-circuit rating
 - b. Voltage
 - c. Continuous current
 - 4. Fuse ratings and type
 - 5. Cable terminal sizes
 - 6. Product data sheets

1.05 SUBMITTALS – FOR CONSTRUCTION

- A. The following information shall be submitted for record purposes:
 - 1. Final as-built drawings and information for items listed in Paragraph 1.04, and shall incorporate all changes made during the manufacturing process.

1.06 QUALIFICATIONS

- A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.

- B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.
- C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.07 REGULATORY REQUIREMENTS

- A. The safety switches shall bear a UL label.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.09 QUALITY ASSURANCE

- A. Electrical components, conductors, devices and accessories described herein shall be listed and labeled as defined by NFPA 70 by a Nationally Recognized Testing Laboratory (NRTL), such as Underwriters Laboratories (UL), for the intended use and shall bear its label.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Subject to the requirements listed herein, provide product by one of the following:
 - 1. Eaton
 - 2. Siemens
 - 3. General Electric
 - 4. Square D
 - 5. Approved Equal
- B. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.

2.02 HEAVY-DUTY SAFETY SWITCHES

- A. Provide switches as shown on drawings, with the following ratings:
 - 1. 30 to 1200 amperes
 - 2. 240 volts ac; 600 volts ac
 - 3. 2 and 3 poles
 - 4. Fusible and non-fusible
 - 5. Mechanical lugs suitable for aluminum or copper conductors.
- B. Construction
 - 1. Switch blades and jaws shall be visible and plated copper.
 - 2. Switches shall have a red handle that is easily pad-lockable with three 3/8-inch shank locks in the OFF position.
 - 3. Switches shall have defeatable door interlocks that prevent the door from opening when the handle is in the ON position (except for double-throw switches). Defeater mechanism shall be front accessible.

4. Switches shall have deionizing arc chutes.
5. Switch assembly and operating handle shall be an integral part of the enclosure base.
6. Switches rated 30 A to 600 A shall have reinforced fuse clips.
7. Switch blades shall be readily visible in the "ON" and "OFF" position.
8. Switch operating mechanism shall be non-teasable, positive quick-make/quick-break type. Bail type mechanisms are not acceptable.
9. Fusible switches shall be suitable for service entrance equipment (except for 4-pole switches and 1200 A when used on 480Y/277 or 600Y/347 grounded WYE systems)
10. Switches shall have line terminal shields (except for non-fusible double throw switches)
11. Switches shall be suitable for systems capable of 200 kA at 480 V with Class J, L, R, or T fusing as applicable for single-throw switches; Embossed or engraved ON-OFF indication shall be provided.
12. Double-make, double-break switch blade feature shall be provided.
13. Fuse pullers shall be provided on all NEMA 4X and 12 switches through 200 A
14. Renewal parts data shall be shown on the inside of the door.

C. Enclosures

1. All enclosures shall be NEMA 1 general purpose, for indoor use, unless otherwise noted.
2. Enclosures shall be NEMA 3R, rainproof, for outdoor or wet location use, unless otherwise noted,
 - a. Enclosures shall NEMA 4X watertight corrosion-resistant; either 304 or 316 stainless steels, or fiberglass where and as indicated in the drawings.
 - b. 30 A to 100 A NEMA 4X, and 12/3R enclosures shall be provided with draw-pull latches.

D. The following factory modifications are to be included:

1. Phenolic nameplates
2. Fungus proofing
3. Lock ON provisions
4. Factory installed neutral assemblies.
5. Class R fuse clips factory installed (30A - 600A)
6. Factory installed ground lug kits.

E. Provide fused switches with:

1. (1) complete set of fuses installed.
2. (1) complete set of fuses as spares.
3. (1) Fuse puller

2.03 SOLAR DISCONNECT SWITCHES

A. Provide 30- to 600-ampere switches as shown on the drawings for solar installations with the following ratings and characteristics:

1. Switches shall be UL listed for 600 VDC and shall be wired according to the listing instructions. Switches shall be wired with one circuit per switch. Multiple circuits shall not be permitted to be switched with a single mechanism.
2. NEMA enclosure shall be NEMA 3R, 12 or 4X as shown on the drawings.
3. Switches shall be listed as "Suitable for NEC Article 690 Applications" and shall be labeled with the maximum solar string as per NEC calculations.
4. Switches that can be energized from both the line and load side shall be marked:

WARNING
ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALS
TERMINALS ON BOTH THE LINE
AND LOAD SIDES MAY BE ENERGIZED
IN THE OPEN POSITION

5. Switches shall be supplied with a clear, factory-installed dead-front shield to guard against accidental contact with line or load terminals.
6. Switches shall have a factory-installed neutral block for terminating grounded conductors, and switches shall have a separate lug for equipment grounding conductors.
7. Fusible switches shall be equipped with Class R fuse clips as standard.
8. Fusible switches shall be supplied with one set of fuse clips only, and fuse holders must be isolated from any potential source when the handle is in the "off" position.

2.04 NAMEPLATES

- A. Nameplate shall be front cover mounted, containing a permanent record of switch type, ampere rating, and maximum voltage rating.
- B. Provide identification plate as indicated in Section 260553 – Identification for Electrical Systems.

PART 3 – EXECUTION

3.01 FACTORY TESTING

- A. Standard factory tests shall be performed on the equipment provided under this section. All tests shall be in accordance with the latest version of UL and NEMA standards.

3.02 INSTALLATION

- A. The equipment shall be installed per the manufacturer's recommendations and all NEC and local code requirements.
- B. Install fuses such that fuse rating information can be read without removing fuse.

3.03 TOUCH-UP PAINTING

- A. Provide touch-up painting to restore and refinish to match original condition surfaces of electrical equipment scratched, marred during shipping, handling or installation. Remove any rust and prime and paint as recommended by manufacturer.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 26 55 68 – EXTERIOR ATHLETIC LIGHTING

Lighting System with LED Light Source

PART 1 – GENERAL

1.01 SUMMARY

- A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- B. The purpose of these specifications is to define the lighting system performance and design standards for SUNY Purchase College Softball / Multipurpose Field using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.
- C. The sports lighting will be for the following venues:
 - 1. Softball
 - 2. Multipurpose 1
 - 3. Multipurpose 2
- D. The primary goals of this sports lighting project are:
 - 1. **Guaranteed Light Levels:** Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore, light levels are guaranteed to not drop below specified target values for a period of 25 years.
 - 2. **Environmental Light Control:** It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators, and neighbors.
 - 3. **Cost of Ownership:** In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated for the duration of the warranty.
 - 4. All lighting designs shall comply with IESNA RP6-22 and NCAA Best Lighting Practices for Intercollegiate Play.

1.2 FIELD LIGHTING PERFORMANCE

- A. **Illumination Levels and Design Factors:** Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting manufacturers will provide a guarantee that light levels will be sustained over the life of the warranty period. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below.

Manufacturers will provide lumen maintenance data of the LED luminaires used per TM-21-11 and will incorporate the lumen maintenance projections into the lighting designs to ensure target light levels are achieved throughout the guaranteed period of the system. Per IES guidelines, lumen maintenance hours should be reported based on the 6x multiplier of testing hours.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Softball	Infield – 70fc Outfield – 50fc	Infield – 2:1 Outfield – 2.5:1	Infield – 25 Outfield - 82	20' x 20'
Bullpens	40fc	2:1	24	10' x 10'

Bleachers	20fc	5:1	26	10' x 10'
Multipurpose 1	50fc	2:1	84	30' x 30'
Multipurpose 2	40fc	2:1	60	20' x 20'

- B. Color Temperature: The lighting system shall have a minimum color temperature of 5700K and a CRI of 75.
- C. Playability: Lighting design and luminaire selection should be optimized for playability by reducing glare and providing sufficient uplight.
1. Aiming Angles: To reduce glare, luminaire aiming should ensure the top of the luminaire field angle (based on sample photometric reports) is a minimum of 10 degrees below horizontal.
 2. Glare Control Technology – Luminaires selected should have glare control technology including, but not limited to: external visors, internal shields and louvres. No symmetrical beam patterns are acceptable.
 3. Aerial Lighting – Adequate illumination must be provided above the field in order to see the ball in flight. It is recommended that a lighting analysis be performed above the field of play to evaluate the visibility of the ball over its typical trajectory to ensure the participants will adequately see the ball. Calculation planes should be evaluated up to the maximum anticipated height for the level of play.
 4. Mounting Heights: To ensure proper aiming angles, minimum mountings heights shall be as described below. Higher mounting heights may be necessary for luminaire with lesser glare control to meet field angle requirements of section 1.2.C.1.

# of Poles	Pole Designation	Pole Height
1	A1	60ft
2	A2, S3	100ft
4	B1, B2, S1, S2	80ft

1.3 ENVIRONMENTAL LIGHT CONTROL

- A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.
- B. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet above grade.

	Maximum
Horizontal Footcandles at 150ft from Field Perimeter	0.35 fc
Vertical Footcandles at 150ft from Field Perimeter	0.80 fc
Candela at 150ft from Field Perimeter	10,000 cd

- C. Environmental glare impact scans must be submitted showing the maximum candela from the field edge on a map of the surrounding area until 500 candela or less is achieved.
- D. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines. Light levels shall be provided in 30-foot intervals along the boundary line at

3 ft above grade.

- E. Sample Photometry: The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years of experience or by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.
- F. Field Verification: Lighting manufacturer shall supply field verification of environmental light control using a meter calibrated within the last 12 months:
 - 1. Spill verification: Illumination levels shall be taken in accordance with IESNA LM-5-04. The light sensing surface of the light meter should be held 36 inches above the playing surface with the sensing surface horizontal (for horizontal readings) or vertically pointed at the brightest light bank (for max vertical readings)

1.4 Cost of Ownership

- A. Manufacturer shall submit a 25-year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

PART 2 – PRODUCTS

2.1 SPORTS LIGHTING SYSTEM CONSTRUCTION

- A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.
- B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.
- C. System Description: Lighting system shall consist of the following:
 - 1. Galvanized steel poles and cross-arm assembly.
 - 2. Non-approved pole technology:
 - a. Square static cast concrete poles will not be accepted.
 - b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
 - 3. Lighting systems shall use concrete foundations. See Section 2.4 for details.

- a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 4,000 PSI. 4,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
 - b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or re-inforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.
4. Manufacturer will supply all drivers and supporting electrical equipment
- a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Drivers located at the top of the poles are not allowed.
 - b. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
6. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
7. Control cabinet to provide remote on-off control, monitoring, and entertainment features of the lighting system. See Section 2.3 for further details.
8. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
- a. Integrated grounding via concrete encased electrode grounding system.
 - b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.
- D. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

- A. Electric Power Requirements for the Sports Lighting Equipment:
 - 1. Electric power: 480 Volt, 3 Phase
 - 2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.
- B. Energy Consumption: The kW consumption for the field lighting system shall be 90 kW or less.

2.3 CONTROL

- A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.
- B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.
- C. Contactor control of lights: To minimize wear on drivers and other electrical components and prevent lights from turning on due to communication loss, circuits must be controlled via contactor

switching, not dimming driver output to zero.

- D. Dimming: System shall provide for 3-stage dimming (high-medium-low). Dimming will be set via scheduling options (Website, app, phone, fax, email).
- E. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields to only having permission to execute "early off" commands by phone. Scheduling tool shall be capable of setting curfew limits.

Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

- F. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).
- G. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.

Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.

1. Cumulative hours: shall be tracked to show the total hours used by the facility
2. Report hours saved by using early off and push buttons by users.

- H. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.
- I. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication.

2.4 STRUCTURAL PARAMETERS

- A. Wind Loads: Wind loads shall be based on the 2018 International Building Code. Wind loads to be calculated using ASCE 7-16, an ultimate design wind speed of 120mph and exposure category C.
- B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2013 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-6).
- C. Foundation Design: The foundation design shall be based on soil parameters as outlined in the geotechnical report. (Use with any of the above building codes when stamped foundation design is required.)
- D. Foundation Drawings: Project specific foundation drawings stamped by a registered engineer in the state where the project is located are required. The foundation drawings must list the moment, shear (horizontal) force, and axial (vertical) force at ground level for each pole. These drawings must be submitted at time of bid to allow for accurate pricing.

PART 3 – EXECUTION

3.1 SOIL QUALITY CONTROL

- A. It shall be the Contractor's responsibility to notify the Owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:
 - 1. Providing engineered foundation embedment design by a registered engineer in the State of New York for soils other than specified soil conditions.
 - 2. Additional materials required to achieve alternate foundation.
 - 3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.2 DELIVERY TIMING

- B. Delivery Timing Equipment On-Site: The equipment must be on-site 8-10 weeks from receipt of approved submittals and receipt of complete order information.

3.3 FIELD QUALITY CONTROL

- A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04.
- B. Field Light Level Accountability
 - 1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as "guaranteed" on the illumination summary provided by the manufacturer.
 - 2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.
 - 3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.
- C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles, uniformity ratios, upright for aerial visibility, and offsite candela readings are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.4 WARRANTY AND GUARANTEE

- A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.
- B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

PART 4 – DESIGN APPROVAL

4.1 PRE-BID SUBMITTAL REQUIREMENTS (Non-Approved Products)

- A. Design Approval: The owner / engineer will review pre-bid submittals per section 4.1.B from all the manufacturers to ensure compliance to the specification 10 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.
- B. Approved Product: Musco's Light-Structure System™ with TLC for LED® is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.
- C. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.
- D. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner's representative. Bids received that do not utilize an approved system/design, will be rejected.

REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS PRIOR TO BID

*All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. **Submit checklist below with submittal.***

Yes / No	Tab	Item	Description
	A	Letter/ Checklist	Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.
	B	Equipment Layout	Drawing(s) showing field layouts with pole locations
	C	On Field Lighting Design	Lighting design drawing(s) showing: <ul style="list-style-type: none"> a. Field Name, date, file number, prepared by b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, as well as luminaire information including wattage, lumens, and optics d. Height of light test meter above field surface. e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaires, total kilowatts, average tilt factor; light loss factor.
	D	Off Field Lighting Design	Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Lighting design showing glare along the boundary line in candela. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.
	E	Photometric Report	Provide first page of photometric report for all luminaire types being proposed showing candela tabulations as defined by IESNA Publication LM-35-02. Photometric data shall be certified by laboratory with current National Voluntary Laboratory Accreditation Program or an independent testing facility with over 5 years of experience.
	F	Performance Guarantee	Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the owner. Light levels must be guaranteed to not fall below target levels for warranty period.

	G	Structural Calculations	Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of New York, if required by owner.
	H	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system. They will also provide ten (10) references of customers currently using proposed system in the state of New York.
	I	Electrical Distribution Plans	Manufacturer bidding an alternate product must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed by a licensed Electrical Engineer in the state of New York.
	J	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of New York.
	K	Project References	Manufacturer to provide a list of ten (10) projects where the technology and specific fixture proposed for this project has been installed in the state of New York. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number.
	L	Product Information	Complete bill of material and current brochures/cut sheets for all products being provided.
	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
	N	Non-Compliance	Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted.
	O	Cost of Ownership	Document cost of ownership as defined in the specification. Identify energy costs for operating the luminaires. Maintenance cost for the system must be included. All costs should be based on 25 Years
	P	Environmental Light Control Design	Environmental glare impact scans must be submitted showing the maximum candela from the field edge on a map of the surrounding area until 500 candela or less is achieved.

END OF SECTION

DIVISION 26 – ELECTRICAL

SECTION 265600 – EXTERIOR LIGHTING

PART 1 – GENERAL

1.01 SCOPE

- A. This section includes furnishing, installing and connecting exterior lighting systems.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 01 Specification Sections, and other applicable Specification Sections, the Related Sections listed below, apply to this Section.
- B. Related Sections:
 - 1. Section 260500 – Common Work Results for Electrical
 - 2. Section 260505 – Low-Voltage Electrical Power Conductors & Cables
 - 3. Section 260526 – Grounding and Bonding
 - 4. Section 260543 – Underground Ducts and Raceways for Electrical Systems

1.03 DEFINITIONS

- A. Lighting Fixture: An electrical device that contains one or more lighting elements which provide illumination. The terms “lighting fixture”, “fixture” “luminaire carry the same meaning.

1.04 SUBMITTALS

- A. Product Data: Arrange in order of luminaire designation. The submittals shall consist of manufacturer’s standard catalog cuts and shall include data on features, ratings, listings, certifications, accessories, finishes, dimensions, emergency components, photometric data, and luminaire efficiency data.
- B. Manufacturer standard cut sheets shall be fully highlighted or red-lined with selected features and options to be provided.
- C. Installation, Operation, and Maintenance Manuals.
- D. Substitutions and/or equivalents: Where substitute or equivalent fixtures are proposed for use by the Contractor, and upon request of the Engineer or Architect, provide complete site-specific point by point photometric analysis of the proposed fixtures. The analysis shall be provided at no additional cost. Floor plan backgrounds will be provided by the Engineer /Architect upon request. Results shall include for each space:
 - 1. Average illumination levels (in footcandles.)
 - 2. Max/min ratios
 - 3. Power density (Watts/sq.ft.)
 - 4. Legend and schedule of proposed fixtures which includes lumen output per fixture, watts per fixture.
 - 5. Fixture mounting heights (ft.).
 - 6. Any de-rating factors applied.
 - 7. Point by point plot of illumination levels at not more than 2’ x 2’ spacing.

1.05 QUALITY ASSURANCE

- A. Lighting fixtures shall be of specification grade and listed or labeled by Underwriters Laboratories (UL) or an approved Nationally Recognized Testing Laboratory (NRTL).
- B. LED fixtures shall comply with the following:
 - 1. UL Standard 8750 "Light Emitting Diode Equipment for Use in Lighting Products", IES Standard LM-79 "Electrical and Photometric Measurements of Solid-State Lighting Products", IES Standard LM-80 "Measuring Lumen Maintenance of LED Light Sources", and IES Standard TM-21 "Projecting Long Term Lumen Maintenance of LED Light Sources".
 - 2. ANSI C78.377 "Specifications for the Chromaticity of Solid-State Lighting Products" with LEDs binned within a maximum three-step MacAdam Ellipse to ensure color consistency amongst luminaries of the same type.

1.06 WARRANTY

- A. For non-LED lighting fixtures and components, provide a complete warranty for parts and labor for a minimum of one year from the date of Substantial Completion.
- B. For LED fixtures, lamps, drivers, and components, provide a complete warranty for parts and labor for a minimum of five years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.01 POLES

- A. General:
 - 1. Poles shall be as shown on the drawings, and as specified. Finish shall be as specified on the drawings.
 - 2. The pole and arm assembly shall be designed for wind loading of 100 mph minimum, as required by wind loading conditions at project site, with an additional 30% gust factor and supporting luminaire(s) and accessories such as shields, banner arms, and banners that have the effective projected areas indicated. The effective projected area of the pole shall be applied at the height of the pole base, as shown on the drawings.
 - 3. Poles shall be anchor-bolt type designed for use with underground supply conductors. Poles shall have handhole having a minimum clear opening of 2.5 x 5 inches. Handhole covers shall be secured by stainless steel captive screws.
 - 4. Provide a steel-grounding stud opposite handhole openings, designed to prevent electrolysis when used with copper wire.
 - 5. Provide a base cover that matches the pole in material and color to conceal the mounting hardware pole-base welds and anchor bolts.
 - 6. Hardware and Accessories: All necessary hardware and specified accessories shall be the product of the pole manufacturer.
 - 7. Provide manufacturer's standard finish, as scheduled on the drawings.

B. Types:

1. Aluminum: Provide round or square aluminum poles as indicated in the drawings manufactured of corrosion-resistant AA AAH35.1 aluminum alloy conforming to AASHTO LTS-4. Poles shall be seamless extruded or spun seamless type.
2. Steel: Provide round or square steel poles having minimum 11-gauge steel with minimum yield/strength of 48,000 psi and factory finish. Galvanized steel poles shall comply with ASTM A123 and A153.

C. Foundations for Poles:

1. Foundations shall be cast-in-place concrete, or pre-cast concrete, having 4000 psi minimum 28-day compressive strength.
2. Foundations shall support the effective projected area of the specified pole, arm(s), luminaire(s), and accessories, such as shields, banner arms, and banners, under wind conditions previously specified in this section.
3. Place concrete in spirally wrapped treated paper forms for round foundations, and construct forms for square foundations.
4. Rub-finish and round all above-grade concrete edges to approximately 6 mm (0.25-inch) radius.
5. Anchor bolt assemblies and reinforcing of concrete foundations shall be as shown on the drawings. Anchor bolts shall be in a welded cage or properly positioned by the tie wire to stirrups. Anchor bolts shall be positioned as per the pole manufacturer requirements.
6. Prior to concrete pour, install electrode per Section 260526 - GROUNDING AND BONDING.
7. Only pole manufacturer supplied, or approved anchor bolts may be used in pole foundations.
8. Pre-cast concrete foundations, conforming to the drawings may be used in lieu of cast-in place foundations.

2.02 LIGHTING FIXTURES

- A. Provide lighting fixtures in accordance with the Fixture Schedule.
- B. Luminaires shall be weatherproof, heavy duty, outdoor types designed for efficient light utilization, adequate dissipation of lamp and driver/ballast heat, and safe cleaning and re-lamping.
- C. Provide fixtures with all required mounting hardware, backboxes, adapters, etc. to mount fixtures to poles, walls etc.
- D. Illumination distribution patterns, BUG ratings and cutoff types as defined by the IESNA shall be as shown on the drawings.
- E. Incorporate ballasts in the luminaire housing, except where otherwise shown on the drawings.
- F. Lenses shall be frame-mounted, heat-resistant, borosilicate glass, with prismatic refractors, unless otherwise shown on the drawings. Attach the frame to the luminaire housing by hinges or chain. Use heat and aging-resistant, resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

- G. Lamp sockets for high intensity discharge (H.I.D) fixture shall have locking-type porcelain enclosures in conformance to the applicable requirements of ANSI C81.61-09 and UL 496-08.
- H. Pre-wire internal components to terminal strips at the factory.
- I. Bracket-mounted luminaires shall have levelling provisions and clamp-type adjustable slip-fitters with locking screws.
- J. Materials shall be rustproof. Latches and fittings shall be non-ferrous metal.
- K. Provide manufacturer's standard finish, as scheduled on the drawings. Where indicated on drawings, match finish process and color of pole or support materials.
- L. Luminaires shall carry factory labels, showing complete, specific lamp and ballast information.

2.03 LAMPS

- A. Where lamps are furnished separately, install the proper lamps in every luminaire installed and every existing luminaire relocated or reinstalled as shown on the drawings.
- B. Lamps shall be general-service, outdoor lighting types.
- C. High-Pressure Sodium (HPS) Lamps: Comply with NEMA C78.42, Color Rendering Index (CRI) 21 (minimum), wattage as indicated on fixture schedule. Lamps shall have minimum average rated life of 24,000 hours.
- D. Metal-Halide Lamps: Comply with NEMA C78.43 or NEMA C78.1381. Lamps shall be pulse start or ceramic type with wattage and correlated color temperature as indicated on fixture schedule.
- E. LED sources shall meet the following requirements:
 - 1. Operating temperature rating shall be between -40 degrees C (-40 degrees F) and 50 degrees C (120 degrees F).
 - 2. Correlated Color Temperature (CCT): 5000K unless otherwise specified in the drawings.
 - 3. Color Rendering Index (CRI): greater than or equal to 85.
 - 4. The manufacturer shall have performed reliability tests on the LEDs luminaires complying with Illuminating Engineering Society (IES) LM79 for photometric performance and LM80 for lumen maintenance and L70 life.
- F. Mercury vapor lamps shall not be used.

2.04 BALLASTS AND DRIVERS

- A. LED drivers shall be electronic type, labeled as compliant with radio frequency interference (RFI) requirements of FCC Title 47 Part 15, and comply with NEMA SSL 1 "Electronic Drivers for LED Devices, Arrays, or Systems". LED drivers shall have a sound rating of "A", have a minimum efficiency of 85%, and be rated for a THD of less than 20 percent at all input voltages.
- B. Dimmable LED drivers shall be 0-10V type. Dimmable LED drivers shall be capable of dimming without LED strobing or flicker across their full dimming range.
- C. Ballasts and drivers shall be rated for the ambient temperatures in which they are located. Outdoor fixtures shall be equipped with ballasts or drivers rated for reliable starting to -20 degrees F. Indoor

fixtures located in areas with direct sunlight or above normal ambient temperatures shall have ballasts or drivers rated at 65 degrees C minimum.

- D. Individually fused ballasts and drivers shall have their fuses accessible from outside of the fixture chassis.

2.05 EMERGENCY LIGHTING

- A. Provide emergency egress lighting where indicated on the drawings.
- B. Emergency lighting shall consist of normal lighting fixtures with generator or battery-inverter system backup, emergency lighting fixtures with individual battery backup, or sealed beam emergency lighting units in accordance with the Fixture Schedule.
- C. Emergency lighting fixtures shall be capable of providing the listed emergency illumination for not less than 90-minutes after loss of normal power.
 - 1. Battery-backed LED emergency lighting fixtures shall consist of a normal LED fixture with some or all the LEDs connected to a battery and charger. The battery shall be nickel cadmium and sized for a minimum of 90 minutes of fixture operation. The charger shall be solid-state and provide overload, short circuit, brownout and low battery voltage protection. The battery and charger shall include self-diagnostic and self-exercising circuitry to exercise and test itself for 5 minutes every month and for 30 minutes every 6 months. The fixture shall include a test/monitor module with LED status indicating lights mounted to be visible to the public. The fixture shall not contain an audible alarm. Batteries used outdoors shall be cold weather rated (-4 °F).

PART 3 - EXECUTION

3.01 INSTALLATION REQUIREMENTS

- A. Install lighting in accordance with the NEC, as shown on the drawings, and in accordance with manufacturer's recommendations.
- B. Pole Foundations:
 - 1. Excavate only as necessary to provide sufficient working clearance for installation of forms or foundation and proper use of tamper to the full depth of the excavation. Prevent surface water from flowing into the excavation. Thoroughly compact backfill with compacting arranged to prevent pressure between conductor, jacket, or sheath, and the end of conduit.
 - 2. Install poles as necessary to provide a permanent vertical position with the bracket arm in proper position for luminaire location.
 - 3. After the poles have been installed, shimmed, and plumbed, grout the spaces between the pole bases and the concrete base with non-shrink concrete grout material. Provide a plastic or copper tube, of not less than 9 mm (0.375-inch) inside diameter through the grout, tight to the top of the concrete base to prevent moisture weeping from the interior of the pole.
- C. Install lamps in each luminaire requiring lamping.
- D. Adjust and aim luminaires that require aiming.
- E. Wall-Mounted Fixtures:

1. Install per NEC, the drawings and manufacturer's instructions.
2. Provide all required mounting hardware.
3. Install fixtures on suitable listed backboxes.
4. All building penetrations shall be thoroughly caulked and sealed watertight.

3.02 GROUNDING

- A. Install grounding for exterior lighting using materials and methods specified in Section 16060 Grounding and Bonding.
- B. Install a 10-foot-long x 3/4" diameter copper clad ground rod at each pole.
- C. Connect the ground lug of metal pole to the ground rod using a #6 AWG copper conductor. Where the copper grounding conductor is connected to metal other than copper, provide bi-metallic connectors listed for this purpose.

3.03 FIELD QUALITY CONTROL

- A. Verify operation of fixtures and controls after installing and energizing circuits.

END OF SECTION

DIVISION 31 – EARTHWORK

SECTION 310000 – EARTHWORK

PART 1 - GENERAL

1.01 GENERAL

- A. Applicable provisions of the "Conditions of the Contract" shall govern all work under this section.
- B. Contractor must observe and adhere to New York Code, 6 NYCRR, Chapter IV and all applicable Subchapters and Parts for the receipt of, or removal, transport, tracking and disposal of all soils and construction waste and debris, as enforced by the New York State Department of Environmental Conservation. All fees associated with testing of materials and debris either at the point of origin (site) or point of termination, are to be borne by the Contractor.
- C. Related Documents:
 - 1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and sections in Division 01 of these Specifications.
 - 2. Section 033000 – Cast-In-Place Concrete
 - 3. Section 310001 – Site Work General Provisions
 - 4. Section 312500 – Erosion and Sediment Controls
 - 5. Section 320117 – Pavement Repair and Resurfacing
 - 6. Section 321216 – Asphalt Paving
 - 7. Section 321216.11 – Asphalt Overlay
 - 8. Section 334000 – Storm Drainage Utilities
 - 9. Other Division 31, 32 & 33 Sections related to the work of the Contract as applicable.

1.02 SCOPE/SUMMARY

- A. Provide all labor, materials, equipment, and services and perform all operations required to complete the installation of all work of this section and related work as indicated on the drawings and specified herein, including, but not limited to, the following:
 - 1. Erect and maintain barriers in accordance with all local municipal and state requirements.
 - 2. Remove all obstructions in the way of new construction work which may be required in addition to clearing and removal work specified under Section 310001 – Site Work General Provisions.
 - 3. Excavation and preparation of sub grade for building slabs, floor slabs, depressions and pits, foundations, interior and exterior column footings, walks, stairs, ramps, and pavements. All other excavation which may be required to complete the work and is not specified under other sections.
 - 4. Shoring, sheathing, and pumping.
 - 5. Backfilling all work within building lines to the required grades.
 - 6. Granular fill course for support building slabs is included as part of this work.
 - 7. Excavating and backfilling of trenches within building lines.
 - 8. Excavating and backfilling for underground mechanical and electrical utilities and buried mechanical and electrical appurtenances, transformer pads, and conduits for same, underfloor

utility lines, etc. inside or outside of the building footprint.

9. Filling and grading.

10. Finish grading of sub grade.

11. Finished grades.

B. Final grading, together with placement and preparation of topsoil for lawns and planting, is specified elsewhere in Division 32 - Exterior Improvements.

1.03 DEFINITIONS

A. Excavation consists of removal of material encountered to subgrade elevations indicated or required by the work and subsequent disposal of materials removed. Materials to be excavated shall be non-classified and shall include all rock, earth, or other materials encountered in excavating and grading operations for building or site work. The contract price covers the removal of all such materials to the depth and extent indicated on the drawings specified herein or as required to perform the work.

B. Unauthorized excavation consists of removal of materials beyond required sub grade elevations or dimensions without specific direction of the Soils Engineer. Unauthorized excavation, as well as remedial work directed by the Soils Engineer, shall be at the Contractor's expense.

1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation with compacted controlled structural fill material or by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation.

2. In locations other than those above, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Construction Manager (when applicable), Architect or the Soils Engineer.

C. Additional Excavation: When excavation has reached required subgrade elevations, notify the Architect/Engineer, who will make an inspection of conditions. If Architect/Engineer (based upon Soils Engineer's reports) determines that bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated material as directed by the Soils Engineer.

1. Removal of unidentified unsuitable materials and its replacement beyond the limits required for the construction work as directed will be paid on basis of Conditions of the Contract relative to changes in the work.

D. Sub grade: The undisturbed earth or the compacted soil layer immediately below granular subbase, drainage fill, or topsoil materials.

E. Fill is that material removed from excavations or imported from off site borrow areas, predominantly granular, non-expansive soils free from roots and other deleterious matter. Fill material is subject to approval.

F. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

1.04 SUBMITTALS

A. Test Reports: The Contractor shall submit the following reports directly to the Construction Manager (if applicable), the Owner, and the Architect:

1. Test reports on borrow material.
2. Verification of suitability of each footing subgrade material, in accordance with specified requirements including substantiation of and structural capacity of existing rock on which new footings are to bear.
3. Field reports; in-place soil density tests.
4. One optimum moisture-maximum density curve for each type of soil encountered.
5. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

1.05 QUALITY ASSURANCE

- A. Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
- C. Use equipment adequate in size, capacity, and numbers to accomplish the work of this section in a timely manner.
- D. Engineering, Testing, and Inspection Services: The Contractor shall make arrangements for and the Owner shall pay for a qualified independent geotechnical testing laboratory and associated soil engineer (acceptable to the Owner) to perform soil survey and soil testing service for sampling and testing of materials proposed to be used as well as substantiation and verification of existing subsurface conditions when desired depths of excavation are reached. The Contractor will be responsible for all costs associated with failed tests resulting from their work.
- E. Testing Laboratory Qualifications: To qualify for acceptance, the geotechnical testing laboratory and associated soils engineer must demonstrate to the Owner's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct required field and laboratory geotechnical testing without delaying the progress of the work.

1.06 SOILS ENGINEER (SERVICES AS EMPLOYED AND PAID BY THE OWNER)

- A. For site conditions without complex soil problems, a registered soils engineer shall be engaged to perform the following minimum services:
 1. Examine on-site materials to determine suitability for use.
 2. Recommend locations for placing on-site materials.
 3. Recommendations for compacting on-site materials.
 4. Determine suitability of soil under footings, foundations.
 5. Perform compaction tests and supervise filling operations.
- B. Soils engineer's services for problem site conditions shall include the above and the following additional work at minimum:

1. Determine extent of unsuitable material removal.
2. Testing of materials proposed for use from off-site and on-site sources.
3. Dewatering recommendations.
4. Supervising the placing and compacting of approved materials and under footings, foundations, slabs, utility lines, and paved areas.
5. Supervising environmental protection procedures as required by Federal, State, and Municipal Agencies.

NOTE: Copies of soils reports prepared by soils engineer are to be sent to the Owner, the Architect, and Construction Manager (if applicable).

1.07 PROJECT CONDITIONS

- A. Site Information: Data in subsurface investigation reports were used for the basis of the design and are available to the Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. The Construction Manager, The Architect, and the Owner will not be responsible for interpretations or conclusions drawn from these data by the Contractor.
 1. Additional test borings and other exploratory operations may be performed by the Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.
- B. Examine the areas and conditions under which the work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.
- C. Set all lines, elevations, and grades for utility and drainage system work and control system for duration of work, including careful maintenance of bench marks, property corners, monuments, or other reference points.
- D. Existing Utilities: Locate existing underground utilities in areas of excavation work. This work to be substantiated and paid by this Contractor. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations. If damaged, repair or replace at no additional cost to the Owner.
 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with the Owner, the Construction Manager (if applicable) and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 2. Do not interrupt existing utilities service facilities occupied by the School or others, during occupied hours, except when permitted in writing by Architect/Engineer and then only after acceptable temporary utility services have been provided.
 3. Provide minimum 48-hour notice to the Construction Manager (when applicable), Architect, and Owner, and receive written notice to proceed before interrupting any utility.
 4. If service is interrupted as a result of work under this section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.

5. If existing utilities are found to interfere with the permanent facilities being constructed under this section, immediately notify the Architect and secure his instructions.
 6. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active.
- E. Use of Explosives: Use of explosives is permitted for certain types of rock removal only but that use must be substantiated with the Owner, Architect/Engineer, State, and Local Agencies prior to bidding and again prior to commencement of work.
1. The use of explosives is only permitted when the Owner has been notified of same by written notice of the Contractor through Architect/Engineer, thereby permitting the Owner and its surrounding neighbors the required legal notices to vacate and/or protect their properties, buildings, homes, or premises as needed.
- F. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.
1. Operate warning lights as recommended by authorities having jurisdiction.
 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 3. Provide all protective measures necessary for the safety of workmen. The above shall be carried out in accordance with and in compliance with regulations of local, county, federal, and OSHA authorities having jurisdiction over same. Protection is entirely the responsibility of the Contractor.
 4. The work shall be executed so that no damage or injury will occur to the Owner's property or building, to public and adjoining or adjacent structures, streets, paving, sewers, gas, water, electric, or any other pipes. Should any damage or injury caused by the Contractor or anyone in his employ, or by the work under this Contract occur, the Contractor shall, at his expense, make good such damage and assume all responsibility for such injury.
 5. The above shall also include the protection of all existing sewers and drainage systems to remain in use within the area affected by the work of this project.
 6. Monuments, benchmarks, and other reference features on streets bounding this project shall be protected. Should these be disturbed in any manner, the Contractor shall have them replaced.
 7. Use every means necessary to prevent dust from becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
 8. Maintain access to adjacent areas at all times.
- G. The Contractor is to acquaint himself with the existence and location of all surface and subsurface structures and utilities within the project area. He is not to damage any of those that are to remain, and he is to leave them accessible and make the necessary provisions by sheeting, hanging, supporting, or other means necessary to obtain this result, subject to the approval of Architect/Engineer, the local municipality, the utility company involved, and any other agencies having jurisdiction over this project.
- H. Prior to entering his bid, the Contractor shall visit the site and familiarize himself with all existing conditions. All nearby existing buildings and utilities shall be inspected by the Contractor prior to

entering his bid.

- I. Borings were prepared by others, and provided by the Owner. The Geotechnical Report contained herein shall be reviewed prior to bid. The documents are for information only. Contractor shall interpret for themselves the soil condition underlying the surface of the ground.
- J. Perform excavation by hand within dripline of large trees to remain. Protect root systems from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP.
- B. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups CG, SC, ML, MH, CL, CH, OL, OH, and PT.
- C. Granular Fill: Naturally or artificially graded mixture or natural or crushed gravel, crushed stone, crushed slag, and natural or crushed sand meeting requirements for New York State Department of Transportation Standard Specification 304.2.02, Type 4 unless otherwise indicated.
- D. Subbase Material: Graded mixture of crushed rock, with 100 percent passing a 2-inch sieve and meeting requirements for New York State Department of Transportation Standard Specification 3.04-2.02, Type 2, unless otherwise indicated.
- E. Backfill and Fill Materials: Satisfactory non-expansive soil materials free of organic material, roots, other deleterious substances, clay, rock or gravel larger than 2 inches in any dimension, debris, waste and frozen materials.

2.02 CONTROLLED STRUCTURAL FILL OR MATERIAL

- A. Imported controlled structural fill shall consist of inert material that is hard, durable stone and coarse sand, practically free from silts, clay, frozen sections, and foreign substances. It may consist of either natural or washed soil and must be free of organics. The material shall be a well graded mixture, shall have no material larger than 4", and must have the following gradations by weight:

Maximum retained on 3/4-inch sieve:	30%.
Maximum retained on No. 4 sieve:	50%.
Maximum passing 100 sieve:	25%.
Maximum passing 200 sieve:	5%.

This grading shall be determined in accordance with ASTM Standard Specification C117 and C136.

2.03 SUB BASE FILL OR MATERIAL

- A. Sub base fill shall consist of inert material that is clean, hard, durable stone, sand, and non-plastic silt completely free from clays, frozen sections, and foreign substances. It may consist of either natural or washed soil and must be free of organics. The sub base fill shall be a well graded mixture, shall have material not larger than 2 inches, and must comply with the following grain size gradation by weight:

Maximum passing No. 100 sieve: 35%.
Maximum passing No. 200 sieve: 25%.

This grading shall be determined in accordance with ASTM Standard Specification C117 and C136.

2.04 WEED KILLER

- A. Provide a dry, free-flowing, dust-free chemical compound, soluble in water, capable of inhibiting growth of vegetation, and approved for use on this work by governmental agencies having jurisdiction.

2.05 TOPSOIL

- A. Where and if shown on the drawings or otherwise required, provide topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonably free from subsoil, roots, heavy or stiff clay, stones, noxious weeds, sticks, brush, litter, and other deleterious matter.
- B. Obtain topsoil from sources within the project limits, or provide imported topsoil obtained from sources outside the project limits, or from both sources. Stockpiled topsoil may be used, provided it meets the requirements of these specifications. Additional topsoil from certified off-site sources shall be used, provided it meets the requirements of these specifications. Topsoil for lawn and planting operations shall be fertile, friable, natural loam containing a liberal amount of humus. It shall be free of admixtures and subsoil and shall be reasonably free of noxious weed, seed, lumps, plants, or their roots, and completely free of stones, sticks, and other extraneous matter, and shall not be used for planting operations while in a frozen or muddy condition. After spreading to a uniform depth of 6" minimum, all topsoil shall be raked to remove all extraneous matter. Raked topsoil shall conform to the mechanical analysis specified below and shall be free of stones, lumps, plants or their roots, sticks and similar debris, or any other undesirable material. Topsoil shall not be used in a muddy or frozen condition.
 - 1. All topsoil to be furnished shall be subject to the approval of the Architect. Furnish a certified analysis, made by a recognized authority, of any topsoil that may have to be furnished to complete the work of this section. Test reports shall match the format listed below.
 - 2. Topsoil shall have an acidity range of pH 5.0 to 7.0 and shall contain not less than 6 percent organic matter as determined by loss on ignition of moisture-free samples dried at 100 degrees centigrade. The mechanical analysis of the soil shall be as follows:

<u>Passing</u>	<u>Retained On</u>	<u>Percentage</u>
1" screen		100%
1" screen	¼" screen (gravel)	Not more than 3%
¼" screen	No. 100 USS mesh sieve (sand)	40%-60%
#100 USS	(Very fine sand, silt & clay)	40%-60%

- 3. Topsoil in which more than 60 percent of the material passing the USS No. 100 mesh sieve consists of clay as determined by the hydrometer or by the decantation method, shall not be used. All percentages are to be based on dry weight samples. The chemical and mechanical analysis shall state the above items in correct quantities.
- 4. The Architect reserves the right to take samples of the topsoil from time to time, whether delivered to or stored at the site. These samples will be analyzed for comparison with the Specifications. Should tests show that topsoil does not comply with the Specifications, the material may be rejected or such other remedy made as approved by the Architect in the form of the addition of humus or other supplemental materials.

5. The topsoil mixture materials shall be thoroughly mixed by hand or by rotary mixer to the satisfaction of the Architect.

2.06 OTHER MATERIALS

- A. Provide other materials, not specifically described, but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Excavation Classifications: The following classifications of excavation will be made when rock is encountered:
 1. Earth Excavation includes excavation of pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.
 2. Rock excavation for trenches and pits includes removal and disposal of materials and obstructions encountered that cannot be excavated with a track-mounted power excavator, equivalent to Caterpillar Model No. 215C LC, and rated at not less than 115 HP flywheel power and 32,000-pound drawbar pull and equipped with a short stick and a 42-inch wide, short tip radius rock bucket rated at 0.81 cubic yard (heaped) capacity.
 3. Trenches in excess of 10 feet in width and pits in excess of 30 feet in either length or width are classified as open excavation.
 4. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered that cannot be dislodged and excavated with modern, track-mounted, heavy-duty excavating equipment without drilling, blasting, or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or equivalent track-mounted loader, rated at not less than 210 HP flywheel power and developing minimum of 45,000 pound breakout force (measured in accordance with SAE J732).
 - a. Typical materials classified as rock are boulders 1/2 cu. yd. or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits.
 - b. Intermittent drilling, blasting, or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.
 5. Rock Excavation:
 - a. In the event that rock is encountered and is of a type that cannot be broken up and excavated by machine or moved into deep fill areas, blast as necessary, and remove and dispose of same off site.
 - b. Rock that can be broken up, excavated by machine, and/or moved into deep fill areas shall be reduced to a size not exceeding 6" prior to depositing in deep fill areas.
 - c. Definition: Whenever the word "removal" is used in connection with rock, it is to be construed to mean "blasting, excavating, and the removal of rock that cannot be broken up by machine and removed", as defined previously.
 - 1) As this facility is in session daily Monday through Friday and its surrounding neighbors

are contiguous, the preferred methodology of excavation and removal of rock is to be construed as "passive" in nature--meaning "drilling or any other passive means". The excavation contractor shall coordinate his/her work with the Owner's representative so as to perform that work with the least disruption to the Owner and the Owner's neighbors and with maximum intent to the safety of same. The preferred time of rock removal work shall take place when the Owner's facilities are vacated, thereby meaning after the close of school each day or on weekends, as long as these times are permitted by all State and Local Ordinances and are acceptable and coordinated with the School and its neighbors.

- d. Blasting shall conform strictly to all local and state laws, rules, and regulations applying thereto, and shall avoid excess noise and vibration. Steel mats shall be provided where necessary to prevent damage from flying fragments. Drill holes shall not be carried any further than necessary to remove the rock desired. The care, handling, and storing of explosives shall conform strictly to all local and state laws, rules, and regulations applying thereto. After concrete is set in place, no blasting shall be done except with the written permission of the Owner, and Architect.
- e. The Contractor may consider the utilization of "Super Bristar 2000", a non-explosive demolition agent as a means of rock removal for this project.
- f. General:
 - 1) Blasting shall be done as necessary for breaking rock for removal to depths, limits, and extent required for the construction of the building, site grading, and utility lines.
 - 2) Blasting shall be performed only by experienced, competent, licensed personnel under the direct supervision of an experienced, competent, licensed foreman.
- g. Precautions:
 - 1) Blasting shall be permitted only when proper and adequate precautions have been taken for the protection of personnel, work, and property.
 - 2) Caps, fuses, and other exploders shall in no case be stored in the same place in which explosives are stored.
 - 3) All operations involving delivery, handling, storage, and the use of explosives shall be conducted in accordance with applicable laws, statutes, and regulations of the State, Municipal, or other governing bodies having jurisdiction. Likewise, the blasting contractor shall secure and pay for all necessary permits on behalf of the excavation contractor/contractor and shall provide same to the Owner, and Architect prior to scheduling the work. Open rock and rock in trenches shall be removed to a depth of 8" below required grades.
- h. Do not perform rock excavation work until material to be excavated has been cross sectioned and classified by the Contractor's qualified independent geotechnical testing laboratory and associated soils engineer (employed and paid by the Contractor), and as approved by Architect/Engineer.
- i. Rock payment lines are limited to the following:
 - 1) Three feet outside of concrete work for which forms are required, except footings.
 - 2) Two feet outside perimeter of footings.

- 3) In pipe trenches, 6 inches below invert elevation of pipe and 2 feet wider than inside diameter of pipe, but not less than 3 feet minimum trench width.
- 4) Outside dimensions of concrete work where no forms are required.
- 5) To bottom of all footings which, as designed, are minimum 1'-8" below finished floor and are to bear on undisturbed rock of 8 T.S.F. bearing capacity minimum. This capacity to be verified by Contractor's geotechnical testing laboratory and associated soils engineer.
- 6) Under slabs on grade, 6 inches below bottom of concrete slab.
- 7) Work indicated herein under these rock payment lines is part of this Contractor's base bid.

3.02 STABILITY OF EXCAVATIONS

- A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.
- B. The Contractor shall safely support and maintain adjacent and abutting property and structures and shall maintain the work safe to life, limb, and property.
- C. Barriers, sheet piling, bracing, and the like shall be installed where required to maintain the excavation and the banks in a safe and stable condition.
- D. Provide sheeting and bracing, when necessary, in trenches and other excavations where protection of workmen is required. Sheeting may be removed after sufficient backfilling to protect against damaging or injurious caving.
- E. Slope sides of excavations to 1:1 or flatter or to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- F. Shoring and bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.
- G. All temporary sheet piling, bracing, shoring, and other protective work shall be removed after the necessity for same ceases to exist, in the opinion of the Architect, and before backfilling.
- H. All work removed or damaged through the installation or removal of the temporary protective work or through improper protection work shall be replaced or repaired in an approved manner at no cost to the Owner.
- I. Maintain excavations free from detrimental quantities of leaves, sticks, trash, and other debris until completion of the work.

3.03 DEWATERING

- A. Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area.
 1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and

discharge lines, and other dewatering system components necessary to convey water away from excavations.

2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.
- B. Surrounding soil shall not be disturbed or removed during pumping operations.
 - C. Water shall be disposed of by pumping to a point directed by the Architect without damage to adjacent property.
 - D. The Contractor shall provide, operate, and maintain adequate equipment to keep the excavations free from water so that the excavating, concrete work, membrane waterproofing, and all other work in the excavations will be performed in the dry.
 - E. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

3.04 STORAGE OF EXCAVATED MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill where directed. Place, grade, and shape stockpiles for proper drainage.
 1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.
 2. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill.

3.05 EXCAVATION FOR STRUCTURES

- A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, and other construction and for inspection.
- B. Contractor shall prepare building and sidewalk areas to underside of floor slab plus or minus 1/2". Under no circumstances shall any material other than approved on-site material, or specified imported controlled structural fill be used for filling within a depth of 10" inches below building and sidewalk slabs on grade or within a depth of 12" beneath all column or wall support footings. Imported controlled structural fill shall also be utilized in all areas supporting earthen or other load carrying structures where organic soil materials are encountered subsequent to the removal of said organic soil materials.
- C. Excavations for footings and foundations: Take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work. Piers, concrete slabs, and footings shall be benched a minimum of 2" into rock at sloping rock conditions as indicated on the drawings where no excavation is required.
- D. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Structures: Conform to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot; plus a sufficient distance to permit placing and removal of concrete formwork, installation of services, and other construction, and for inspection. Do not disturb bottom of excavations intended for bearing surface.
- E. Unsuitable Material: All unsuitable material below the grading plane shall be excavated and removed and the space filled with granular material as specified herein.

1. Unsuitable materials are those soils that exhibit characteristics that make them unsuitable for the direct support of the pavement structure, such as organic silt, elastic clays and silts, topsoil, frost susceptible soils, etc. Unsuitable materials shall be removed to the depth directed by the Soils Engineer and the Construction Manager when applicable.
 2. The excavation and disposal of unidentified unsuitable material below the grading plane shall be paid on the basis of the Conditions of the Contract relative to Changes in the Work.
 3. The granular fill material will be used in the fill sections within the paving area. No additional payment will be made for placing this material in the fill areas.
- F. Unsuitable material will be legally disposed of off site.

3.06 EXCAVATION FOR PAVEMENTS, SLOPES, DITCHES, ETC.

- A. The work under this item shall consist of the following in accordance with the plans, specifications, addenda, bid proposal, and requirements herein: excavating for pavement, slopes, ditches, and all other work incidental to the excavation for the pavement, including disposing of unsuitable and surplus material, preparing the subgrade, compaction, grading, slopes and shoulders, and all other work needed to complete the item.
- B. Cut surface under pavements to comply with cross sections, elevations, and grades as indicated.
- C. Drainage and Site Maintenance: During construction, the site shall be maintained in such condition that it will be adequately drained at all times.
- D. Unsuitable Material: All unsuitable material below the grading plane shall be excavated and removed and the space filled with granular material as specified herein.
 1. Unsuitable materials are those soils that exhibit characteristics that make them unsuitable for the direct support of the pavement structure, such as organic silt, elastic clays and silts, topsoil, frost susceptible soils, etc. Unsuitable materials shall be removed to the depth directed by the Soils Engineer and the Construction Manager when applicable.
 2. The excavation and disposal of unidentified unsuitable material below the grading plane shall be paid on the basis of the Conditions of the Contract relative to Changes in the Work.
 3. The granular fill material will be used in the fill sections within the paving area. No additional payment will be made for placing this material in the fill areas.
- E. Unsuitable material will be legally disposed of off site.
- F. The Contractor shall store topsoil, embankment soils, and other materials, and/or to excavate beyond the limits of the contract and slope easements. The cost of stockpiling and rehandling shall be included in his base bid price.
- G. All soils that are classed as suitable for the direct support of the pavement (non-organic and non-frost susceptible soils) shall be scarified to a loose depth of ten (10) inches and recompact to 95% of the maximum density at the optimum moisture content of the soils determined by ASTM D-1557. The moisture content at the time of compaction shall not be greater than one (1) percent nor less than two (2) percent by weight of dry soil of the optimum moisture content. Dry soils shall be moistened and thoroughly mixed to the required moisture content. Wet soils shall be dried by aerating the required moisture content.
 1. The cost of adding moisture, drying, and compaction shall be included in the Contractor's base

bid price.

- H. Subgrade in excavated areas for new pavement shall be compacted to the density specified below. Soils not conforming to this density shall be scarified or loosened to a depth of ten (10) inches, water added in the amount necessary, and the material recompacted to provide the required density.
 - 1. Compaction control will be provided as follows: The subgrade in excavated areas shall be compacted to at least ninety-five (95) percent of the maximum density as determined by the "Test for Moisture Density Relations of Soils using a 10 lb. Rammer and 18 inch Drop", ASTM D-1557 as currently revised. Samples of subgrade materials for testing purposed shall be taken at frequent intervals daily. From these tests, corrections and changes in moisture content will be made and compaction continued until required densities are achieved.
- I. The Contractor shall check the work under this Item with templates, slope boards, or other devices satisfactory to the Soils Engineer. The completed work shall conform to the plans within the following tolerances.
- J. For pavement subgrade, the surface shall vary no more than three-quarter ($\frac{3}{4}$) inch from a ten (10) foot straight edge applied to the surface, and the actual grade of the subgrade shall not vary more than one (1) inch from plan elevation.

3.07 TRENCH EXCAVATION FOR PIPES AND CONDUIT

- A. Excavate trenches to uniform width, sufficient wide to provide ample working room and a minimum of 6 to 9 inches of clearance on both side of pipe or conduit.
- B. Accurately cut trenches for pipe or conduit that is to be installed to designed elevations and grades to line and grade from 4" below bottom of pipe and to width as specified. Place 4" of bedding material, compact in bottom of trench, and accurately shape to conform to lower portion of pipe barrel. After pipe installation, place select backfill and compact in maximum 6" layers measured loose to the top of the trench.
- C. Excavate trenches and conduit to a depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost lines.
 - 1. Where rock is encountered, carry excavation 6" below required elevation and backfill with a 6" layer of crushed stone or gravel prior to installation of pipe.
 - 2. For pipes or conduit less than 6" in nominal size, and for flat-bottomed, multiple-duct conduit units, do not excavate beyond indicated depths. Hand-excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.
 - 3. For pipes and equipment 6 inches or larger in nominal size, shape bottom of trench to fit bottom of pipe for 90° (bottom 1/4 of the circumference). Fill depressions with tamped sand backfill. At each pipe joint, dig bell holes to relieve pipe bell of loads ensuring continuous bearing of pipe barrel on bearing surface.
 - 4. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects.
 - 5. When the void is below the sub-grade for the utility bedding, use suitable earth materials and compact to the relative density of 95 percent (in accordance with ASTM D698).

6. When the void is in the side of the utility trench or open cut, use suitable earth or sand compacted or consolidated to a relative density of 92 percent (in accordance with ASTM D1557).
 7. Remove boulders and other interfering objects, and backfill voids left by such removals, at no additional cost to the Owner.
- D. The local utility companies shall be contacted before excavation shall begin. Dig trench at proper width and depth for laying pipe, conduit, or cable. Cut trench banks as nearly vertical as practical and remove stones as necessary to avoid point-bearing. Over excavate wet or unstable soil, if encountered, from trench bottom as necessary to provide suitable base for continuous uniform bedding.
- E. All trench excavation side walls greater than 5 feet in depth shall be sloped, shored, sheeted, braced, or otherwise supported by means of the sufficient strength to protect the workmen within them in accordance with the applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Lateral travel distance to an exit ladder or steps shall not be greater than 25 feet in trenches 4 feet or deeper.
- F. Accurately grade trench bottom to provide uniform bearing and support for each section of pipe on bedding material at every point along entire length, except where necessary to excavate for bell holes, proper sealing of pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make joint connection properly.
- G. Trench width requirements below the top of the pipe shall not be less than 12" nor more than 18" wider than outside surface of any pipe or conduit that is to be installed to designated elevations and grades. All other trench width requirements for pipe, conduit, or cable shall be at least practical width that will allow for proper compaction of trench backfill.
- H. Trench depth requirements measured from finished grade or paved surface shall meet the following requirements or applicable codes and ordinances:
1. Water mains: 50" to top of pipe barrel.
 2. Sanitary Sewer: Elevations and grades as indicated on drawings (48" minimum cover).
 3. Storm Sewer: Depths, elevations, and grades as shown on drawings.
 4. Electrical Conduits: 30" minimum to top of conduit or as required by NEC 300-5, NEC 710-36 codes, or the local utility company requirements, whichever is deeper.
 5. TV Conduits: 18" minimum to top of conduit or as required by the local utility company, whichever is deeper.
 6. Telephone Conduits: 30" minimum to top of conduit, or as required by the local utility company, whichever is deeper.
 7. Gas Mains and Service: 30" minimum to top of pipe, or as required by the local utility company, whichever is deeper.
 8. Where utilities are under a concrete structure slab or pavement, the minimum depth need only be sufficient to completely encase the conduit or pipe sleeve, and electrical long-radius rigid metal conduit riser, provided it will not interfere with the structural integrity of the slab or pavement.

9. Where the minimum cover is not provided, encase the pipes in concrete as indicated. Provide concrete with a minimum 28-day compressive strength of 2,500 psi.

I. Excavating for Appurtenances:

1. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.
2. Over-depth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete at no additional cost to the Owner.
3. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing for the pipe on prepared bottom of the trench.

3.08 COLD WEATHER PROTECTION

- A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F.

3.09 BACKFILL AND FILL

- A. All excavations shall be backfilled as promptly as the work permits but not before concrete has attained its full design strength and not until completion of the following:
 1. Acceptance of construction below finish grade, including, where applicable, damp-proofing and water-proofing.
 2. Inspecting, testing, approving, and recording locations of underground utilities.
 3. Removing concrete formwork.
 4. Removing shoring and bracing, and backfilling of voids with satisfactory materials.
 5. Removing trash and debris within excavated areas.
 6. Placement of horizontal bracing on horizontally supported walls.
- B. No frozen material shall be used. Backfill shall be placed in uniform horizontal layers of approximately 8" in depth. Each layer shall be moistened during compaction. Compaction shall be done in a manner approved by the Architect and shall be continued until fill is solid and no settlement will occur.
- C. When sheeting, shoring, and bracing is removed, all voids shall be filled with sound materials and thoroughly tamped.
- D. Backfill operations shall be made to the new surface grades as shown on the drawings.
- E. No backfill shall be placed covering other work until after such work has been inspected and approved. Any backfilling placed on earth that has caved in and covered other work before same has been inspected and approved shall be removed when so directed.
- F. Excess material, if any, and all rubbish shall be removed from the site or otherwise disposed of as may be directed by the Architect.
- G. General: Place soil material in layers to required subgrade elevations, for each area classification

listed below, using materials specified herein.

1. Under grassed areas, use satisfactory excavated or borrow material.
2. Under walk sand pavements, use subbase material.
3. Under steps, use subbase material.
4. Under foundations, use controlled structural fill material.
5. Under building slabs, use granular material or on site sub grade material if determined acceptable by the Architect or Soils Engineer.
6. Under piping, conduit, and equipment, use subbase materials where required over rock bearing surface unless otherwise indicated. Shape excavation bottom to fit bottom 90° of cylinder.

3.10 CONTROLLED STRUCTURAL FILL OR MATERIAL

- A. Location: Imported controlled structural fill shall be used when necessary to provide proper soil bearing capacity:
 1. Under all proposed buildings and sidewalks and at least 5 feet beyond the limits of the proposed buildings to a depth as required by foundation design where sidewalks are not part of the scope of building work.
 2. Under all footings (continuous or spread) to a depth of at least 12 inches, or as required by foundation design.
 3. For all load carrying structures which are situated in areas of soft organic soil deposits subsequent to the removal of said soft organic soil deposits.
 4. Sand shall be used as bedding for all drainage and sewerage utilities, unless groundwater problems are encountered or anticipated that may require the use of crushed stone.

3.11 SUB BASE FILL OR MATERIAL

- A. Location: The subbase fill may be used in all fill areas where controlled structural fills specified for buildings are not required due to soil conditions, as long as the requirements listed in Section 2.03A are met. Under no circumstances shall subbase material be in directed contact with structural support component, or in support of any of the proposed utilities.
- B. Backfill trenches with concrete where trench excavations pass with 18" of column or wall footings and that are carried below bottom of such footings or that pass under wall footings. Place concrete to level of bottom of adjacent footing.
 1. Concrete is specified in Division 03.
 2. Do not backfill trenches until test and inspections have been made and backfilling is authorized by Contracting Officer. Use care in backfilling to avoid damage or displacement of pipe systems.
- C. Provide 4" thick concrete base slab support for piping or conduit less than 2'-6" below surface of roadways. After installation and testing of piping or conduit, provide minimum 4" thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.
- D. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
2. Inspection testing, approval, and recording locations of underground utilities have been performed and recorded.
3. Removal of concrete formwork.
4. Removal of shoring and bracing and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities or leave in place if required.
5. Removal of trash and debris from excavation.
6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

3.12 PLACEMENT AND COMPACTION

- A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
 1. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.
- B. Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand operated tampers.
- C. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
- D. Place backfill and fill materials evenly adjacent to structure, piping or conduit to required elevations. Prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.
- E. Where the construction includes basement or other underground walls having structural floors over them, do not backfill such walls until the structural floors are in place and have attained sufficient strength to support the walls.
- F. Control soil and fill compaction, providing minimum percentage of density specified for each area classification indicated below. Correct improperly compacted areas or lifts as directed if soil density test indicate inadequate compaction.
 1. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density, in accordance with ASTM D 1557 (Modified Proctor):
 - a. Under footings, compact subgrade and subbase material to at least 95% maximum dry density.

- b. Under structures, building slabs and steps, and pavements, compact top 12" of subgrade and each layer of backfill or fill material to at least 95% maximum dry density.
- c. Under lawn or unpaved areas, compact top 6" of subgrade and each layer of backfill or fill material to a MAXIMUM of 85% maximum dry density.
- d. Under synthetic turf, compact top 6" of subgrade and each layer of backfill or fill material to at least 90% maximum dry density.
- e. Under walkways, compact top 6" of subgrade and each layer of backfill or fill material to at least 95% maximum dry density.

G. Moisture Control:

- 1. Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface during or subsequent to compacting operations.
- 2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
- 3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture-density relation tests.

3.13 FILLING AND BACKFILLING

A. Filling and backfilling work shall include, but is not limited to, the following:

- 1. Contractor shall place and compact bank-run sand and gravel from approved imported sources consisting of clean bank-run gravel or sandy gravel, free from organic material, loam, wood, trash, snow, ice, and other objectionable material, well graded within the following limits:

Maximum retained on 3/4" sieve:	30%.
Maximum retained on No. 4 sieve:	50%.
Maximum passing 100 sieve:	25-30%.
Maximum passing 200 sieve:	5%.

No material larger than 2-1/2" to 4" sieve size by weight. When available, on-site material may be used in place of imported controlled structural fill with the Soils Engineer's approval.

- 2. Compaction of bank-run gravel under footings, foundation, under slabs on grade, and in building areas shall be to 95% of maximum density in accordance with ASTM Test Designation D1557.
- 3. Granular material where required under footings and foundations shall conform to material and gradations previously specified and shall be determined in accordance with ASTM Standard Specifications C117 and C136.
- 4. Filling--Imported Controlled Structural Fill: Compaction of the controlled imported structural fill shall be performed at a moisture content 3% drier than optimum as determined in the lab. It shall be placed in uniform layers not exceeding 10 and/or 12 inches thick after compaction. Each lift shall be compacted to not less than 95% of the maximum dry density determined within the lab as modified proctor density and shall be monitored by the soils engineer using the applicable ASTM standard for testing. Each lift shall have a minimum of 2 feet density test per 500 square yards, one located in the area of the propose column and the second located

under a continuous wall footing. More frequent testing may be required at the discretion of the Soils Engineer based on the extent of filling on any given day or should any area become suspect.

5. Filling--Subbase Fill: Compaction of all subbase fill, either imported or on-site, shall be compacted at a moisture content 1-1.5% drier than optimum as determined in the lab. The subbase fill shall be placed in uniform layers not exceeding 8 inches in depth when uncompacted. Each lift shall be compacted to not less than 95% of its maximum dry density determined in the lab as modified standard for testing. At least two field density test shall be performed per lift within the area being filled on any given day beneath buildings provided the lift areas do not exceed 500 square yards.

3.14 TRENCH BACKFILLING

- A. Criteria: Trenches shall not be backfilled until required tests are performed and the utility systems comply with and are accepted by applicable governing authorities. Backfill trenches as specified. If improperly backfilled, reopen to depth required to obtain proper compaction. Backfill and compact, as specified, to properly correct condition in an acceptable manner.
- B. Backfilling: After pipe or conduit has been installed, bedded, and tested as specified, backfill trench or structure excavation with specified material placed in 8" maximum loose lifts. Compact to minimum density of 95 percent of optimum density in accordance with ASTM D698 (or 92 percent of optimum density in accordance with ASTM D1557).
- C. Compaction: Exercise proper caution when compacting immediately over top of pipes or conduits. Water jetting or flooding is not permitted as method of compaction.
- D. Compaction Testing: Independent testing laboratory shall perform test at intervals not exceeding 200'-0" of trench for the first and every other 8" lift of compacted trench backfill and furnish copies of test results as specified.

3.15 MATERIALS FOR FILL UNDER CONCRETE SLABS ON GRADE

- A. Contractor is to establish building pad at underside of floor slab, plus or minus 1/2".
- B. Prior to placing fill fine grading materials on building pad, existing pad fill shall be leveled and recompacted.
- C. Fill materials under concrete slabs on-grade in building areas, under sidewalks, pads, concrete aprons, etc., are to be the sieve analysis previously shown for controlled structural fill.
- D. Compaction of fill shall be as previously set forth. When compacting fill with mechanical compactor against foundation walls, pits, loading dock, etc., Contractor shall provide complete protection against damage to said installations.
- E. There is to be a layer of no less than 6" of clean suitable bank run sand fill below all slabs on grade. On site material may be acceptable and its usability is to be verified via soils reports. The Contractor's bid is to be based on the use of on site material for use under slabs unless indicated otherwise within the Construction Documents.
- F. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum, quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.
 1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction

to specified density.

2. Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

3.16 GRADING

- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and as follows:
 1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
 2. Walks: Shape surface of areas under walks to line, grade, and cross section, with finish surface not more than 1/2" above or below required subgrade elevation.
 3. Shape the surface or areas scheduled to be under pavement to line, grade, and cross section, with finished surface not more than 0.05 feet above or below the required subgrade elevation.
- C. Grading Surface or Fill under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a 10-foot straight edge.
- D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.17 PAVEMENT SUB BASE COURSE

- A. General: Subbase course consist of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course.
 1. Refer to other Division 32 sections for paving specifications.
- B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.
- C. Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12-inch width of shoulder simultaneously with the compaction and rolling of each layer of subbase course.
- D. Placing: Place sub base course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.
 1. When a compacted subbase course is indicated to be 6" thick or less, place material in a single layer. When indicated to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.18 FOOTING AND BUILDING SLAB SUB BASE COURSE

- A. General: Subbase course consists of placement of subbase material, in layers of indicated thickness, over subgrade surface and/or granular fill to support concrete building slabs as indicated on drawings.
- B. Placing: Place material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.
 - 1. When a compacted subbase course is indicated to be 6" thick or less, place material in a single layer. When indicated to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.19 FIELD QUALITY CONTROL

- A. Quality Control Testing During Construction: Allow testing service and the Construction Manager (when applicable) to inspect and approve each subgrade and fill layer before further backfill and construction work is performed.
 - 1. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ATM D 2167 (rubber balloon method), as applicable.
 - 2. Field density tests may also be performed by the nuclear method in accordance with ASTM D 2922, providing that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. In conjunction with each density calibration check, check the calibration curves furnished with the moisture gauges in accordance with ASTM D3017.
 - a. If field tests are performed using nuclear methods, make calibration checks of both density and moisture gauges at beginning of work, on each different type of material encountered, and at intervals as directed by the Contracting Officer.
 - 3. Footing Subgrade: Per each stratum of soil on which footings will be placed, perform at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested stratum when acceptable to the Construction Manager (if applicable) and the Architect.
 - 4. Paved Areas and Building Slab Subgrade: Perform at least one field density test of subgrade for every 2,000 sq. ft. of paved area or building slab, but in no case fewer than three tests. In each compacted fill layer, perform one field density test for every 2,000 sq. ft. of overlaying building slab or paved area, but in no case fewer than three tests.
 - 5. Foundation Wall Backfill: Perform at least two field density tests at locations and elevations as directed.
 - 6. If it is determined by the Construction Manager (if applicable), the Architect, the Owner, and/or Independent geotechnical testing laboratory and associated soils engineer, based on testing service reports and inspection, subgrade or fills that have been placed are below specified density, perform additional compaction and testing until specified density is obtained.

3.20 EROSION CONTROL

- A. Provide erosion control methods in accordance with requirements of authorities having jurisdiction or if the project is of sufficient size to require one, refer to the Storm Water Prevention and Protection Plan included elsewhere herein.

3.21 MAINTENANCE

- A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density prior to further construction.
- D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.22 CERTIFICATION

- A. Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the Architect a written report from a soil engineer certifying that the compaction requirements have been obtained and the type or classification of fill material placed.

3.23 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. All rubbish and other excavated material, which in the opinion of the Architect is not suitable for fill or grading, shall be removed and legally disposed of away from the premises.
- B. Approved excavated material shall be spread on the site in locations as directed by the Architect.
- C. Excavated material in excess of that required for all filling, backfilling, and rough grading shall become the property of the Contractor and shall be removed from the premises and legally disposed of.
- D. Removal from the School's Property: Remove waste materials, including unacceptable excavated material, trash, and debris, and dispose of it off the School's property.

END OF SECTION

DIVISION 31 – EARTHWORK

SECTION 310001 – SITE WORK GENERAL PROVISIONS

PART 1 - GENERAL

1.01 GENERAL:

- A. Applicable provisions of the “Conditions of the Contract” shall govern the work of this section and under Division 31, 32 & 33.

1.02 SCOPE/SUMMARY:

- A. The Drawings and Specifications are intended to provide for a complete and ready for operation installation. However, both the Drawings and Specifications are for the Contractor's guidance and are not intended to give every detail of the existing conditions or new installations nor do they describe every fitting required for the installation of the work. The Contractor shall furnish, install, and place in workmanlike manner all equipment, accessories, supports, fittings, and all other material needed for the complete installation.
- B. Before submitting his proposal, the Contractor shall be fully informed to the extent, character and intent of the work to be done by him. No consideration will be granted for any misunderstanding of the material to be furnished or work to be performed.
- C. The site work scope shall include providing all plant facilities, labor, materials, tools, equipment, appliances and supervision necessary or incidental to complete site work, including, but not limited to, the following:
 - 1. Surveying and layout work
 - 2. Preliminary work
 - 3. Demolition
 - 4. Clearing and grubbing
 - 5. Striping and stockpiling existing topsoil
 - 6. Protection
 - 7. Removal and disposal
 - 8. Rough grading, excavating, filling, backfilling and dewatering
 - 9. Excavating, trenching, and backfilling for utility systems including gas, water, electric, telephone, storm and sanitary lines.
 - 10. Sediment and erosion control procedures as may be required.
 - 11. Storm water drainage systems, catch basins and manholes
 - 12. Site improvements, including but not limited to, fencing, curbing, striping, signage, guardrails, paving, lighting, retaining walls and miscellaneous related work.
 - 13. Landscape work
 - 14. Finish grading and paving
 - 15. Site work water mains, electric and gas services
 - 16. Sanitary sewer systems, including manholes and exterior grease traps
 - 17. Concrete work in connection with site preparation and development
- D. Perform all work in accordance with all applicable local, state, and federal codes, laws, and ordinances.
- E. Sediment and erosion control procedures shall be performed as required and in conformance with Specification Section 312500; and for LEED Certified projects, in accordance with the requirements of LEED SS Prerequisite 1

- F. If the project is of a size and scope that requires a Storm Water Pollution Prevention Plan (SWPPP) refer to additional documentation provided elsewhere herein and conform to its requirements in conjunction with and as related to this section.

1.03 GENERAL PROVISIONS:

A. Verifying Existing Conditions:

1. The Contractor, before submitting his bid, shall examine the site to which this work is in any way dependent upon according to the intent of these Specifications and accompanying Drawings. He shall report to the Architect, in writing, prior to his bid any conditions which prevent him from performing his work. No "Waiver of Responsibility" for inadequate, incomplete, or defective work will be considered by the Architect unless written notice has been filed by the Contractor.

a. Cooperation:

- 1) When a project involves construction on an existing occupied site, the work called for in this Specification and indicated on the accompanying Drawings shall be carried on in conjunction with the continued operation of the existing building and shall be so arranged that its installation and operation will conform with and facilitate the early installation of work.
- 2) The Contractor shall bear the expense required to revise his work due to any failure to coordinate the installation of his work with that of the building's operation.
- 3) The Contractor shall be responsible for the distribution and information concerning his work as required for the prompt installation and coordination with other trades.

b. Accessibility and Clearances:

- 1) The Contractor shall inform himself fully regarding peculiarities and limitations of space for the installation of the materials and equipment under Division 31, 32 & 33. He shall verify all dimensions and conditions in the field. No extra compensation will be allowed because of differences between actual dimensions and the sizes shown on the Drawings.
- 2) The Contractor shall see that equipment and apparatus necessary to be reached from time to time for operation and maintenance are made easily accessible.
- 3) Although the location of items may be shown on the Drawings in a specific place, the construction may disclose the fact that the location for this work does not make its position easily and quickly accessible. In such case, the Contractor shall call the Architect's attention to same before installing the work and shall be guided by the Architect's instruction.

1.04 PRELIMINARY WORK:

- A. Before starting the work, make a thorough inspection of the work area to determine the physical condition of natural features and adjacent improvements to remain.
- B. Provide complete mark out/tone out of existing utilities for coordination of proposed work. Repair any damage that occurs to existing utilities to remain at no additional cost to the owner.
- C. Notify all authorities owning utility lines running to or on the property. Protect and maintain all utility lines that are to remain on the property and cap those that are not required in accordance with the

instructions of the utility companies or local authorities having jurisdiction over them.

PART 2 - PRODUCTS

This part not used.

PART 3 – EXECUTION

3.01 PROTECTION:

- A. The Contractor shall effectively protect, at his expense, all materials and equipment, including his employees, during the period of construction, and he shall be held responsible for all damage done to his work, until the same is fully accepted by the Architect.
- B. Provide protection necessary to prevent damage to existing building(s), concrete, pavement, utilities or vegetation indicated on the Contract Documents to remain. Box or otherwise protect from damage all trees, shrubs, lawns, etc. which are to be preserved. Trees shall be kept free from guy lines. Remove all protection when work is completed and when authorized to do so by the Architect.
- C. Protect improvements on adjoining properties and on Owner's property.
- D. Restore damaged improvements to original condition as acceptable to Architect and/or Owner.
- E. Protect the property, adjoining properties, wetlands, etc. from damage by soil erosion by installing silt fences and hay bales or as indicated in the projects Storm Water Pollution Prevention Plan, if one is applicable.
- F. Conduct site operations to ensure minimum interference with parking lots, roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct parking lots, streets, walks, or other occupied or used facilities without permission from the Owner and/or authorities having jurisdiction.
- G. Provide traffic control as required, in accordance with the New York State Department of Transportation "Manual of Uniform Traffic Control Devices" and the local jurisdiction traffic safety requirements.
- H. Streets, roadways, parking lots, etc. shall be thoroughly cleaned and/or swept on a daily basis.

3.02 CLEARING and GRUBBING:

- A. Clear and grub in the areas of the proposed building, paved areas and/or site improvements in preparation for rough grading and new construction.
- B. Completely remove all trees, shrubs, stumps, roots, vegetation, growth, paving, boulders, rocks, rubbish, and all other material interfering with the installation of new construction or not suitable for rough or finished grading, except trees or shrubs directed or indicated to remain.
- C. Remove all roots 1" in diameter or larger. Remove all boulders and rocks larger than 3" in largest dimension.
- D. Remove all topsoil, peat, and soils containing a high degree of organic matter. (Coordinate with Item 3.03 below)

- E. Remove all soft clay soils and rubbish fills.
- F. Excavation resulting from the removal of trees, roots, and the like shall be filled with suitable on-site material or imported fill as approved by the Architect/Engineer. Place fill material in horizontal layers not exceeding 8" loose depth, and thoroughly compacted per fill requirements.

3.03 STRIPPING and STOCKPILING EXISTING TOPSOIL:

- A. Existing topsoil and sod on the site within area designated on the drawings shall be stripped to whatever depths encountered to prevent intermingling with underlying subsoil or other objectionable material. Cut heavy growths of grass from areas before stripping.
- B. Free the topsoil of stones, roots, brush, rubbish, clay or other unsuitable materials/objects over 2" in diameter and remove the latter from the premises before stockpiling the topsoil.
- C. Care shall be taken not to contaminate the topsoil with clay or other unsuitable materials and remove the latter from the premises before stockpiling the topsoil.
- D. Stockpile topsoil in storage piles where indicated or permissible within site staging perimeter (coordinate with Architect and/or Construction Manager). Construct storage piles to freely drain surface water. Cover storage piles as required to prevent windblown dust. Excess topsoil shall be removed from the site by the Contractor unless specifically noted otherwise on the drawings.
- E. Refer to soil erosion and sediment control drawing, if included, for additional details.

3.04 DEMOLITION:

- A. Existing structures (where indicated), concrete and paving on the site (where indicated), including all existing/discovered inactive cesspools, cisterns, wells, foundation materials shall be completely demolished and all debris removed from the site. Excavation resulting from the removal sub-surface structures, foundations/footings shall be filled with suitable on-site material or imported fill as approved by the Architect/Engineer. Place fill material in horizontal layers not exceeding 8" loose depth, and thoroughly compacted per fill requirements.
- B. Remove existing above grade and below grade improvements and abandoned underground piping or conduit as shown on the drawings or necessary to permit construction and other work.
- C. All work shall be executed in such a manner as not to endanger the safety of the workmen or the public. All barriers and precautionary measures shall be erected as required.

3.05 REMOVAL and DISPOSAL:

- A. Dispose of all debris resulting from the work of this section. Haul off site and dispose of legally.
- B. Do not burn rubbish, organic matter, etc. on the site.
- C. Do not bury concrete, rock, stumps/roots, etc. on the site.

END OF SECTION

DIVISION 31 – EARTHWORK

SECTION 310002 – STAKE OUT

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide all plants, labor, tools, appliances, equipment, materials, and services required for the work indicated on the drawings and specified for this section.

PART 2 - MATERIALS

2.01 PRODUCTS

- A. Not applicable to this section.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall employ a competent registered (New York State) surveyor to lay out the work and to establish all points, lines, and grades necessary for the proper execution of the work. The surveyor shall contact the Owner's representative before laying out the work at the site in order to coordinate the proper alignment of the work.
- B. The Contractor shall have his engineer or surveyor place a sufficient quantity of stakes so that the location of all items to be installed can be clearly determined. This portion shall also be coordinated with the Owner's representative before commencing work.
- C. At the completion of the work, the Contractor must submit to the Owner's representative a signed certification of the accuracy of the vertical elevations and horizontal locations of the work in relation to the contract plans. This must take the form of "as-built" drawings (a transparency of the contract plans may be used) and shall bear the signature and registration number of a registered New York State surveyor hired by or in the employ of the Contractor. This will be strictly enforced so that the Owner may have an accurate record of the completed work.
- D. Should any discrepancy be found between points, lines, or grades shown on the drawings and actual conditions found in the field, the Contractor shall immediately notify the Owner's representative of such discrepancy, and the Contractor will not proceed with the work affected thereby until he has received the necessary instructions from the Landscape Architect or his representative.
- E. The Contractor shall carefully maintain any benchmarks, monuments, and other reference marks, and, if disturbed or destroyed, replace as directed. All markers, permanent stakes, and any other reference marks used in the layout shall be left in place as directed by the Owner's representative.

END OF SECTION

State University of New York
Construction Agreement

PLEASE NOTE: SECTIONS THAT HIGHLIGHTED MUST BE FILLED OUT TO COMPLETE THIS CONTRACT. THIS INCLUDES CONTENT IN PAGE 1, SECTIONS 4.20, 5.06, THE SIGNATURE PAGE & SCHEDULE A. DELETE THIS TEXT BEFORE FINALIZING THIS AGREEMENT.

This Agreement (referred to alternately as "Agreement" or "Contract") made as of the _____ day of _____, 20____, for Contract Number _____ by and between STATE UNIVERSITY OF NEW YORK, a corporation organized and existing under the laws of the State of New York, with its principal office located at State University Plaza, 353 Broadway, Albany, New York 12246, on behalf of State University of New York at _____ located at _____ hereinafter referred to as "University" and _____ having its principal office located at _____, and a Federal ID or Social Security No. of {insert number}, hereinafter referred to as "the Contractor."

WITNESSETH:

The parties hereto agree that the Contractor shall:

(a) furnish and perform all work of every kind required and all other things necessary to complete in the most substantial and workmanlike manner the construction of

SU-092923
Multi-Purpose Synthetic Turf Facility (Electrical Work)
At Purchase College

in strict accordance with the Contract Documents; and

(b) complete all work necessary for substantial completion by **within 270 days after the date of the Notice to Proceed**, or within the time to which such completion may have been extended in accordance with the Contract Documents;

(c) in the event it fails to substantially complete all the work on time, pay to the University liquidated damages in accordance with the liquidated damages schedule listed on page one of the Contractor's proposal for each calendar day of delay of substantially completing all the work; and

(d) do everything required by the Contract; subject, however, to the terms, provisions and conditions listed hereinafter.

(e) The University shall pay and the Contractor shall accept as full and complete payment for the performance of this Agreement, subject to additions or deductions as provided herein, the total contract compensation of \$_____, (in figures), _____ (in words).

Article I
General Provisions

Section 1.01 Definitions

Where the following words and expressions are used in the Contract Documents it is understood that they have the meaning set forth as follows:

Allowance Any and all work and materials which may be required of the Contractor in performing work set forth under one or more allowances to this Agreement shall be Work, as defined herein, which shall be performed in accordance with the base schedule for the performance of the Contractor's Work. Contractor shall not be entitled to an extension of time for the performance of an allowance or all allowances.

Consultant The Architect or Engineer named in the Notice to Bidders or such other person or firm designated by the University to provide general administration of the Contract and inspection of the work.

Bidding Notice to Bidders, Information for

State University of New York
Construction Agreement

Documents	Bidders and Proposals
Bonds	Performance Bond and Labor and Material Bond
Delay	For purposes of this document and as used herein and in any other contract documents between the Contractor and the University the word “delay” shall be interpreted broadly and shall include by way of example only and not by way of limitation: delay, disruption, interference, inefficiencies, impedance, hindrance, acceleration, resequencing, schedule impacts, lack of timeliness by the University and/or Consultant, and lack of coordination, cumulative impact of multiple change orders, delay and other impacts.
Contract or Contract Documents	The Agreement, Exhibits A and A-1, Bidding Documents, Bonds, Specifications, Project Manual, Drawings Addenda issued prior to the opening of bids and Change Orders issued after award of the Contract.
University	State University of New York
Notice to Proceed	Written notice provided by the University to the Contractor stating the date on which the contractor can begin project work.
Project	The facility or facilities to be constructed including all usual, appropriate and necessary attendant work shown on, described in or mentioned in the Contract.
Site	The area within the Contract limit lines, as shown on the Drawings, and all other areas upon which the Contractor is to perform work.
Substantial Completion	Substantial Completion is the completion of Work so that the Project can be fully occupied and used for the purposes for which it is intended. Substantial Completion includes: (1) completion of all work required for the issuance of a code compliance certificate, or a temporary approval for occupancy, completed in a manner that includes no uncorrected deficiency or material violation of the Building Code of New York State within the area or work for which the certificate is to be issued; (2) completion of all building systems and functional testing of said systems (other than tests that cannot be performed due to the seasonal environmental conditions in effect at the time of completion); (3) acceptance and approval of the Operating Instructions and Manuals and Training of Campus Personnel; and (4) the sum of values determined for Punch List work at the time of Substantial Completion shall not exceed one (1) percent of the amount of the Contract consideration unless otherwise agreed to by the University.
Work	The using, performing, installing, furnishing and supplying of all materials, equipment, labor, services and incidentals necessary or proper for or incidental to the successful completion of the Project and the carrying out of all duties and obligations imposed upon the Contractor by the Contract.

Section 1.02 Captions

The titles or captions of Articles and Sections of the Contract are intended for convenience and reference purposes only and in no way define, limit or describe the scope or intent thereof or of the Contract or in any way affect the Contract.

Section 1.03 Nomenclature

Materials, equipment or other work described in words and abbreviations which have a well-known, technical or trade meaning shall be interpreted as having such meaning in connection with the Contract.

Section 1.04 Entire Agreement

The Contract constitutes the entire agreement between the parties hereto and no statement, promise, condition, understanding, inducement or representation, oral or written, expressed or implied, which is not contained herein shall be binding or valid and the Contract shall not be changed, modified, or altered in any manner except by an instrument in writing executed by the parties hereto.

Section 1.05 Successors, Assigns and Agents

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To the extent allowed by the terms of "Exhibit A", the Contract shall bind the successors, assigns and representatives of the parties hereto. The University reserves the right to have the State University Construction University Fund act as its agent at any time or duration of this Agreement. Such designation of the Fund to act on the behalf of the University shall be in writing and addressed to the Contractor.

Section 1.06 Accuracy and Completeness of Contract Documents

- (1) The Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. The intention of the Documents is to include all materials, plant, equipment, tools, skill and labor of every kind necessary for the proper execution of the work and also those things which may be reasonably inferable from the Contract Documents as being necessary to produce the intended results.
- (2) The Contract Documents contemplate a finished piece of work of such character and quality as is reasonably inferable from them. The Contractor acknowledges that the Contract consideration includes sufficient money allowance to make its work complete and operational and in compliance with good practice and it agrees that inadvertent minor discrepancies or omissions or the failure to show details or to repeat on any part of the Contract Documents the figures or notes given on another shall not be the cause for additional charges or claims. In case of a conflict between any part or parts of the Contract Documents with any other part or parts thereof, as contrasted to an omission or failure to show details or to repeat on any part of the Contract Documents the figures or notes given on another part thereof, the following shall be given preference, in the order hereinafter set forth, to determine what work the Contractor is required to perform: (a) Exhibit A and A-1, (b) Addenda (later dates to take preference over earlier dates); (c) Amendments to Agreement; (d) Agreement; (e) Bidding Documents; (f) Specifications; (g) Schedules (i.e. finish schedules); (h) Large scale detail Drawings (detail drawings having a scale of 3/4" and over); (i) Large scale plan and section Drawings (plan and section drawings having a scale equal to or larger than that used for the basic floor or site plan, as the case may be); (j) Small scale detail Drawings (detail drawings having a scale of less than 3/4"); and (k) Small scale plan and section Drawings (plan and section drawings having a scale less than that used for the basic floor or site plan, as the case may be). In the event of such a conflict between or among parts of the Contract Documents that are entitled to equal preference, the more expensive way of doing the work, the better quality or greater quantity of material shall govern unless the University otherwise directs.

Section 1.07 Organization of Contract Documents

The Specifications and Drawings are generally divided into trade sections for the purpose of ready references, but such division is arbitrary and such sections shall not be construed as the prescription by the Consultant or the University of the limits of the work of any subcontractor or as a determination of the class of labor or trade necessary for the fabrication, erection, installation or finishing of the work required. The Contractor will be permitted to allot the work of subcontractors at its own discretion regardless of the grouping of the Specifications and Drawings. It shall be the Contractor's responsibility to settle definitively with each subcontractor the portions of the work which the latter will be required to do. The University and the Consultant assume no responsibility whatever for any jurisdiction claimed by any of the trades involved in the work.

Section 1.08 Furnishing of Contract Documents

The University shall establish the format for the Contract Documents (hard copy and/or electronic media) at the start of the Project. The Contractor shall be furnished, free of charge, with two (2) copies of the Specifications and Drawings in the selected format(s). Any other copies of the Specifications and Drawings which the Contractor may desire can be obtained at the Contractors expense.

Section 1.09 Examination of Contract Documents and Site

By executing the Contract, the Contractor agrees that it has carefully examined the Contract Documents together with the site of the proposed work as well as its surrounding territory; that it is fully informed regarding all the conditions affecting the work to be done and the labor and materials to be furnished for the completion of the Contract; and that its information has been acquired by personal investigation and research and not in the estimates and records of the University.

Section 1.10 Invalid Provisions

If any term or provision of the Contract Documents or the application thereof to any person, firm or corporation or circumstance shall, to any extent, be invalid or unenforceable, the remainder of the Contract Documents, or the application of such terms or provisions to persons, firms or corporations or circumstances other than those to which it is

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held invalid or unenforceable, shall not be affected thereby and each term or provision of the Contract Documents shall be valid and be enforced to the fullest extent permitted by law.

Section 1.11 No Collusion or Fraud

The Contractor hereby agrees that the Contract was secured without collusion or fraud and that neither any officer nor any employee of the University has or shall have a financial interest in the performance of the Contract or in the supplies, work or business to which it relates, or in any portion of the profits thereof.

Section 1.12 Notices

- (1) All notices permitted or required hereunder shall be in writing and shall be transmitted either:
- a. via certified or registered United States mail, return receipt requested;
 - b. by personal delivery;
 - c. by expedited delivery service; or
 - d. by email if actually received by the University. Contractor bears the burden of proof of service by email and receipt of email by the University.

Such notices shall be addressed as follows or to such different addresses as the parties may from time to time designate:

SUNY Purchase College

Name: Elizabeth Pleva
Title: Director of Procurement & Accounts Payable
Address: 735 Anderson Hill Road, Purchase, NY 10577-1402
Telephone Number: 914-251-6070
E-mail address: Elizabeth.pleva@purchase.edu

{insert company name}
Name: {insert designated contact's title}
Title: {insert designated contact's title}
Address: {insert company}
Telephone Number: {insert phone}
E-mail Address: {insert email}

- (2) Any such notice shall be deemed to have been given either at the time of personal delivery or actual receipt by the University, or in the case of email, upon receipt by the University.
- (3) The parties may, from time to time, specify any new or different address in the United States as their address for purpose of receiving notice under this Agreement by giving fifteen (15) days written notice to the other party sent in accordance herewith. The parties agree to mutually designate individuals as their respective representatives for the purposes of receiving notices under this Agreement. Additional individuals may be designated in writing by the parties for purposes of implementation and administration/billing, resolving issues and problems and/or for dispute resolution.

Section 1.13 Singular-Plural; Male-Female

As used in the Contract Documents, the singular of any word or designation, whenever necessary or appropriate, shall include the plural and vice versa, and the masculine gender shall include the female and neutral genders and vice versa.

Article II
Contract Administration and Conduct

Section 2.01 Consultant's Status

- (1) The Consultant, as the University's representative, shall provide general administration of the Contract and inspection of the work. The Consultant will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the work, and it will not be responsible for the Contractor's failure to carry out the work in accordance with the Contract Documents. The Consultant's duties, services and work shall in no way supersede or dilute the Contractor's obligation to perform

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the work in conformance with all Contract requirements, but it is empowered by the University to act on its behalf with respect to the proper execution of the work and to give instructions and/or direction when necessary to require such corrective measures as may be necessary, in its professional opinion, to insure the proper execution of the Contract or to otherwise protect the University's interest.

- (2) The Consultant shall have the authority to stop the work or to require and/or direct the prompt execution thereof whenever such action may be necessary, in its professional opinion, to insure the proper execution of the Contract or to otherwise protect the interests of the University.
- (3) Except as otherwise provided in the Contract, the Consultant shall determine the amount, quality, acceptability, fitness and progress of the work covered by the Contract and shall decide all questions of fact which may arise in relation to the interpretation of the plans and Specifications, the performance of the work and the fulfillment by the Contractor of the provisions of the Contract. The Consultant shall in the first instance be the interpreter of the provisions of the Contract and the judge of its performance and it shall use its power under the Contract to enforce its faithful performance.

Section 2.02 Finality of Decisions

- (1) Any decision or determination of the Consultant under the provisions of the Contract shall be final, conclusive and binding on the Contractor unless the Contractor shall, within ten (10) working days after such decision, make and deliver to the University a verified written statement of its contention that the decision of the Consultant is contrary to a provision of the Contract. The University shall thereupon determine the validity of the Contractor's contention. Pending decision by the University, the Contractor shall proceed in accordance with the Consultant's decision.
- (2) Wherever it is provided in the Contract Documents that an application must be made to the University and/or determination made by the University, the University's decision on such application and/or its determination under the Contract Documents shall be final, conclusive and binding upon the Contractor unless the Contractor, within ten (10) working days after receiving notice of the University's decision or determination, files a written statement with the University and the Consultant that it reserves its rights in connection with the matters covered by said decision or determination and after a court of competent jurisdiction determines the University's said decision or determination to be fraudulent, capricious, arbitrary or so grossly erroneous as necessarily to imply bad faith in an action brought in accordance with Section 4.24.

Section 2.03 Claims and Disputes

- (1) If the Contractor claims (i) that any work it has been ordered to do is extra work or (ii) that it has performed or is going to perform extra work or (iii) that any action or omission of the University or the Consultant is contrary to the terms and provisions of the Contract, it shall:
 - a. Promptly comply with such order;
 - b. Notwithstanding the provisions of Section 1.12 of the Agreement and any other provisions of the Contract documents to the contrary, file with the University and the Consultant, within five (5) working days after being ordered to perform the work claimed by it to be extra work or within five (5) working days after commencing performance of the extra work, whichever date shall be the earlier, or within fifteen (15) working days after the said action or omission on the part of the University or the Consultant occurred, a written notice of the basis of its claim and request a determination thereof.
 - c. Notwithstanding the provisions of Section 1.12 of the Agreement and any other provisions of the Contract documents to the contrary, file with the University and the Consultant, within thirty (30) calendar days after said alleged extra work was required to be performed or said alleged extra work was commenced, whichever date shall be the earlier, or said alleged action or omission by the University or the Consultant occurred, a verified detailed statement, with documentary evidence, of the items and basis of its claim, including an initial and updated detailed Time Progress Schedule,
 - d. Produce for the University's examination, upon notice from the University, such information and documentation as directed by the University, which shall include but not be limited to job cost reports and all estimates and documentation used to develop the Bid Proposal, all its books of account, bills, invoices, payrolls, subcontracts,

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time books, progress records, daily reports, bank deposit books, bank statements, checkbooks and cancelled checks, showing all of its actions and transactions in connection with or relating to or arising by reason of its claim, and submit persons in its employment and in its subcontractors' employment for examination under oath by any person designated by the University to investigate any claims made against the University under the Contract, such examination to be made at the offices of the Contractor; and

- e. Proceed diligently, pending and subsequent to the determination of the University with respect to any such disputed matter, with the performance of the Contract and in accordance with all instructions of the University and the Consultant.
- (2) The Contractor's failure to comply with any or all parts of subdivision b, c and d of paragraph (1) of this Section shall be deemed to be: (i) a conclusive and binding determination on its part that said order, work, action or omission does not involve extra work and is not contrary to the terms and provisions of the Contract; and (ii) a waiver by the Contractor of all claims for additional compensation or damages as a result of said order, work, action or omission. The provisions of subdivision b, c and d of paragraph (1) of this Section are for the purpose of enabling the University to avoid waste of public funds by affording it promptly the opportunity to cancel or revise any order, change its plans, mitigate or remedy the effects or circumstances giving rise to a claim or take such other action as may seem desirable and to verify any claimed expenses or circumstances as they occur. Compliance with such provisions is essential whether or not the University is aware of the circumstances of any order or other circumstances which might constitute a basis for a claim and whether or not the University has indicated it will consider a claim in connection therewith.
- (3) The Contractor's failure to submit and maintain a Time Progress Schedule in accordance with Section 3.02 of the Agreement shall be deemed to be a waiver by the Contractor of all claims for additional time, compensation or damages as a result of any condition which is an alleged cause of delay in the completion of the work. The Schedule of Record, regularly updated and submitted at required durations in accordance with the provisions of the General Requirements, Section paragraph titled "Project Schedule": (i) informs the University and affords it promptly of regular opportunities to change its plans or mitigate or remedy the effects or circumstances giving rise to a claim of delay in the completion of the work or take such other action as may seem desirable to verify any claimed circumstances as they occur; and (ii) forms a record which becomes the basis of the University's verification of an alleged cause of delay in the completion of the work.
- (4) No person has power to waive or modify any of the foregoing provisions and, in any action against the University to recover any sum in excess of the sum certified by the University to be due under or by reason of the Contract, the Contractor must allege in its complaint and prove at the trial compliance with the provisions of this Section.
- (5) Nothing in this Section shall in any way affect the University's right to obtain an examination before trial or a discovery and inspection in any action that might be instituted by or against the University or the Contractor.

Section 2.04 Omitted Work

The University reserves the right at any time during the progress of the work to delete, modify or change the work covered by the Contract, by a Change Order or Field Order thereto providing for either a reduction or omission of any portion of the work, without constituting grounds for any claim by the Contractor for allowances for damages or for loss of anticipated profits and in such event a deduction shall be made from the Contract consideration, the amount of which is to be determined in accordance with the provisions of Section 4.02 or 4.05A of the Agreement.

Section 2.05 Extra Work

- (1) The University reserves the right at any time during the progress of the work to add, modify or change the work covered by the Contract by Change Order or Field Order or as otherwise required by the University thereto providing for extra work of either a qualitative or quantitative nature and in such event the Contract consideration may be increased by an amount to be determined in accordance with the provisions of Sections 4.02 and 4.05A of the Agreement and the completion date for all or any part of the work may be extended for such period of time as may be determined by the University as necessary, because of the extra work, to complete the work or any part thereof.
- (2) Nothing in the Contract Documents shall excuse the Contractor from proceeding with the extra work as directed., The terms and conditions of the Contract Documents shall be fully applicable to all extra work.

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- (3) The Contractor shall have no claim for extra work or an extension of time if the performance of such work, in the judgment of the Consultant, is made necessary or desirable because of any act or omission of the Contractor which is not in accordance with the Contract.
- (4) Notwithstanding the provisions of Section 2.02 of the Agreement and any other provisions of the Contract Documents to the contrary, the University, after conferring with the Consultant, shall have the right to overrule a determination or decision of the Consultant, that relates to whether certain work is included in the Contract Documents or is extra work, which the University believes is incorrect; in the event the University exercises such right, that determination or decision shall be final, conclusive and binding upon the Contractor and the University unless the same shall be determined by a court of competent jurisdiction to have been fraudulent, capricious, arbitrary or so grossly erroneous as necessarily to imply bad faith.

Section 2.06 Contractor to Give Personal Attention

- (1) The Contractor shall give its constant personal attention to all the work while it is in progress and shall place the work in charge of a competent and reliable full-time superintendent acceptable to the Consultant and the University who shall have authority to act for the Contractor and who shall be accountable to the Consultant to the extent provided in the Contract. Unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in its employ, such superintendent shall not be changed without the written permission of the Consultant and the University.
- (2) When the Contractor and its superintendent are temporarily absent from the site of the work, the Contractor or its superintendent shall designate a responsible supervisory employee, approved by the Consultant and the University, to receive such orders as the Consultant or its representative may give. At no time shall any work be conducted on the site in the absence of an individual present who has been so designated by the Contractor or its superintendent as having authority to receive and execute instructions given by the Consultant or its representative.
- (3) If the superintendent, project manager or other supervisory employees are not satisfactory to the University, the Contractor shall, if directed by the University, immediately replace such supervisory employees with other supervisory employees acceptable to the Consultant and the University. Such replacement and all related impacts shall be at no additional cost to the University.

Section 2.07 Employment of Workers

The Contractor shall at all times employ competent and suitable workers and equipment which shall be sufficient to prosecute all the work to full completion in a disciplined orderly manner and in accordance with the Time Progress Schedule and the contractually required time of performance. All workers engaged in special or skilled work shall have had sufficient experience in such work to properly and satisfactorily perform the same. Should the Consultant deem any employee of the Contractor or any subcontractor incompetent, careless, insubordinate or otherwise objectionable or whose continued employment on the work is deemed by the Consultant to be contrary to the public interest, it shall so advise the Contractor and the latter shall dismiss or shall cause the subcontractor, if such employee is employed by the latter, to dismiss such employee and such employee shall not again be employed on the work to be performed under the Contract without obtaining the prior written approval of the Consultant.

Section 2.08 Detailed Drawings and Instructions

Upon timely notice from the Contractor that supplementary information is required, the Consultant shall furnish additional instructions, by means of Drawings or otherwise, necessary for the proper execution of the work. All such Drawings and instructions shall be consistent with the Contract Documents, true developments thereof and reasonably inferable therefrom. The work shall be executed in conformity therewith and the Contractor shall do no work without proper Drawings and/or instructions.

Section 2.09 Contract Documents to Be Kept at Site

The Contractor shall keep at the site of the work a copy of the Drawings and Specifications and shall at all times give the Consultant and the University access thereto.

Section 2.10 Permits and Building Codes

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The Contractor shall obtain from the proper authorities all permits legally required to carry on its work, pay any and all taxes and fees legally required and shall be responsible for conducting its operations in accordance with the provisions of such permits. Except as otherwise expressly provided in the Contract Documents, all of the work covered by this Agreement which is to be performed on property owned by the State University of New York is not subject to the building code of any city, county or other political subdivision of the State of New York. It is, however, subject to the provisions of the Building Code of New York State and the applicable Federal and State health and labor laws and regulations.

Section 2.11 Surveys

- (1) From the data shown on the Drawings and identified at the site by the Consultant, a licensed surveyor, to be designated and paid for by the University, shall establish one (1) fixed benchmark and one (1) fixed base line at the site. The Contractor shall work from the benchmarks and base lines shown on the Drawings, identified at the site by the Consultant and established at the site by the aforesaid surveyor and shall establish such supplementary bench marks and base lines that are required in order for it to lay out the work. The Contractor shall be responsible for all measurements that may be required for execution of the work to the exact position and elevation as prescribed in the Specifications, shown on the Drawings, or as the same may be modified at the direction of the Consultant to meet changed conditions or as a result of modifications to the work covered by the Contract.
- (2) The Contractor shall furnish at its own expense such stakes and other required equipment, tools and materials, and all labor as may be required in laying out any part of the work. If, for any reason, monuments are disturbed, it shall be the responsibility of the Contractor to reestablish them, without cost to the University, as directed by the Consultant. The Consultant may require that construction work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit checking completed work or the work in progress.
- (3) In all multiple-story construction, the Contractor shall establish and maintain line marks at each floor level and grade marks four (4) feet above the finished floor at each floor level.

Section 2.12 Site Conditions

- (1) The Contractor acknowledges that it has assumed the risk and that the Contract consideration includes such provision as it deems proper for all physical conditions and subsurface conditions as it could reasonably anticipate encountering from the provisions of the Contract Documents, borings, rock cores, topographical maps and such other information as the University or the Consultant made available to it prior to the University's receipt of bids or from its own inspection and examination of the site prior to the University's receipt of bids.
- (2) In the event that the Contractor encounters subsurface physical conditions or other latent physical conditions at the site differing substantially from those shown on or described or indicated in the Contract Documents and which could not have been reasonably anticipated from the aforesaid information made available by the University or the Consultant or from the Contractor's aforesaid inspection and examination of the site, it shall give immediate notice to the Consultant of such conditions before they are disturbed. The Consultant will thereupon promptly investigate the conditions and, if it finds that they do substantially differ from that which should have been reasonably anticipated by the Contractor, it shall make such changes in the Drawings and Specifications as may be necessary and a Change Order or Field Order may be issued, the amount of which shall be determined in accordance with the provisions of Sections 4.02 and 4.05A, to reflect any increase or decrease in the cost of, or the time required for, performance of the Contract as a result of any of the aforesaid changes made by the Consultant and/or as a result of such unanticipated subsurface conditions.

Section 2.13 Right to Change Location

When additional information regarding the subsurface conditions becomes available to the University as a result of the excavation work, further testing or otherwise, it may be found desirable to change the location, alignment, dimensions or grades to conform to such conditions. The University reserves the right to make such reasonable changes in the work as, in its opinion, may be considered necessary or desirable; such changes and any adjustments in the Contract consideration as a result thereof are to be made in accordance with the provisions of Sections 2.04, 2.05 4.02 and 4.05A of the Agreement.

Section 2.14 Unforeseen Difficulties

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Except as otherwise expressly provided in Section 2.12 of the Agreement and in other Sections of the Contract Documents, the Contractor acknowledges that it has assumed the risk and that the Contract consideration includes such provisions as it deems proper for any unforeseeable obstacles or difficulties which it may encounter in the performance of the work.

Section 2.15 Moving Materials and Equipment

Should it become necessary, in the judgment of the Consultant, at any time during the course of the work to move materials which are stored on the site and equipment which has been temporarily placed thereon, the Contractor upon request of the Consultant shall move them or cause them to be moved at its sole cost and expense; provided, however, if materials and equipment that have been stored or placed by the Contractor at a location on the site expressly approved, in writing, by the Consultant and the same are moved or caused to be moved by the Contractor at the Consultant's request, such removal shall be deemed extra work and the Contractor shall be compensated therefor in accordance with the provisions of Sections 4.02 and 4.05A of the Agreement.

Section 2.16 Other Contracts

- (1) Prior to and during the progress of the work hereunder the University reserves the right to let or permit the letting of other contracts relating to the Project or in connection with work on sites within the Contract limit lines or adjoining or adjacent to that on which the work covered by this Agreement is to be performed. In the event such other contracts are let, or have previously been let, the Contractor and such other contractors shall coordinate their work with each other, arrange the sequence of their work to conform with the progressive operation of all the work covered by such contracts and afford each other reasonable opportunities for the introduction and storage of their materials, supplies and equipment and the execution of their work. If the Contractor or such other contractors contend that their work or the progress thereof is being interfered with by the acts or omissions of the other or others or that there is a failure to coordinate or properly arrange the sequence of the work on the part of the Contractor or such other contractors, they shall, within five (5) working days of the commencement of such interference or failure of coordination or failure to perform work in proper sequence, give written notification to the University and the Consultant of such contention. Upon receipt of such notification or on its own initiative, the Consultant shall investigate the situation and issue such instructions to the Contractor or such other contractors with respect thereto as it may deem proper. The Consultant shall determine the rights of the Contractor and of such other contractors and the sequence of work necessary to expedite the completion of all work covered by this Agreement in relation to the work covered by said other contracts.
- (2) The Contractor agrees that it has and will make no claim for damages against the University by reason of any act or omission to act by any other contractor or in connection with the Consultant's or University's acts or omissions to act in connection with such other contractor, but the Contractor shall have a right to recover such damages from the other contractors.
- (3) If the proper and accurate performance of the work covered by the Contract depends upon the proper performance and execution of work not included herein or depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Consultant any defects in such work that render it unsuitable for proper execution and results. Its failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the work covered by the Contract, except as to latent defects which may be discovered thereafter.

Section 2.17 Inspection and Testing

- (1) All materials and workmanship shall be subject to inspection, examination and testing by the Consultant and the University at all times during the performance of the work and at all places where the work is carried on. Except as otherwise herein specified, the University shall pay for the cost of inspection, examination and testing by the Consultant or the University. If, however, the tests prove that the materials and/or work tested do not meet the requirements of the Contract, then the entire cost of such tests and any additional testing and or inspections required until the work is deemed compliant is to be borne by the Contractor. The Consultant will have the right to reject defective material and workmanship furnished by the Contractor or require its correction. The Contractor, without charge therefor, shall satisfactorily and promptly correct all rejected work and replace all rejected material with proper material.
- (2) The Contractor shall promptly segregate and remove from the site of the work all rejected material and work. If the Contractor shall fail to proceed at once with the replacing of rejected material and/or correction of defective

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workmanship, the University may, by contract or otherwise, replace such material and/or correct such workmanship, and charge the costs thereof to the Contractor or it may cancel the Contract and terminate the Contractor's employment as provided in the Agreement.

- (3) The Contractor, without additional charge, shall promptly furnish all reasonable facilities, labor materials and equipment with associated operators necessary for the safe and convenient access, inspection and testing that may be required by the Consultant or the University.
- (4) If the Contract Documents or the Consultant's instructions or the applicable laws, ordinances or regulations of any governmental authority require any part of the work covered by the Contract to be specially tested or inspected, the Contractor shall give the Consultant timely notice of its readiness for such testing or inspection or, if the same is to be performed by a governmental authority, of the date fixed therefor. If any such work, without the written permission of the Consultant, should be covered up prior to such testing or inspection, the Contractor, at its sole cost and expense must, if directed by the Consultant, uncover the same for testing or inspection and reconstruct same after the tests or inspection are conducted. All certificates of inspection or testing, involving the Contractor's work, required to be obtained from governmental authorities are to be secured by the Contractor at its sole cost and expense.
- (5) Should it be considered necessary or advisable by the Consultant at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out same, the Contractor, upon request, shall furnish all necessary facilities, labor and material to perform such examination. If the work subject to such examination is found to be defective or nonconforming in any manner due to the fault of the Contractor or any of its subcontractors, such uncovering or destruction and necessary reconstruction, even though such includes work not covered in the Contract, shall be at the expense of the Contractor. If, however, such work after testing and examination is found to be satisfactory, the University will pay the Contractor the cost of such uncovering or destruction and reconstruction, such cost to be determined as in the case of extra work as provided in Sections 4.02 and 4.05A.
- (6) Inspection of material and furnished articles to be incorporated in the work may be made at the place of production, manufacture or shipment unless otherwise stated herein. The inspection of material and workmanship for final acceptance as a whole or in part will be made at the site of the work.

Section 2.18 Subcontractors

- (1) Except for subcontractors designated by the University, or required to be named at any earlier date, pursuant to the provisions of the Information for Bidders, within thirty (30) calendar days after receipt of the notice to proceed, the Contractor must submit a written statement to the Consultant giving the name and address of all proposed subcontractors. Said statement must contain a description of the portion of the work and materials which the proposed subcontractors are to perform and furnish and any other information tending to prove that the proposed subcontractors have the necessary facilities, skill, integrity, past experience and financial resources to perform the work in accordance with the terms and provisions of the Contract Documents.
- (2) If the Consultant finds that the proposed subcontractors are qualified, it will so notify the Contractor within ten (10) working days after receipt of the aforesaid information. If the determination is to the contrary, however, the Consultant within such period will notify the Contractor of such determination and the latter, unless it decides to do such work itself and is qualified, in the Consultant's opinion, to do such work, must, within ten (10) working days thereafter, submit similar information with respect to other proposed subcontractors.
- (3) The Consultant's approval of a subcontractor and/or the University's designation of a subcontractor pursuant to the provisions of the Contract Documents shall not relieve the Contractor of any of its responsibilities, duties and liabilities hereunder. The Contractor shall be solely responsible to the University for the acts or defaults of such subcontractors and of such subcontractors' officers, agents and employees, each of whom shall, for this purpose, be deemed to be the agent or employee of the Contractor to the extent of its subcontract.
- (4) The Contractor shall be fully responsible for the administration, integration, coordination, direction and supervision of all of its subcontractors and of all work and it shall check all space requirements of the work and coordinate and adjust the same so that conflicts in space do not occur in the work being performed by it with its

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own employees and with the work being performed by its subcontractors and so that all equipment, piping, wiring, etc., can be installed, where possible, in the spaces allowed for same.

- (5) No subcontractor shall be permitted to work at the site until: (a) it has furnished satisfactory evidence to the Consultant of the insurance required by law; (b) in the case of a Project involving a federal grant, it has furnished satisfactory evidence to the Consultant of the same type and amount of liability insurance as that required of the Contractor by Section 5.06 of the Agreement; and (c) except for subcontractors designated by the University pursuant to the provisions of the Information for Bidders, it has been approved by the Consultant.
- (6) Within ten (10) working days after the Contractor receives payment from the University on account of a progress payment application for the percentage of the work done, it shall pay each of its subcontractors the sum contained in said payment for the percentage of said subcontractor's work, less the same amount retained therefrom by the University under the terms of the Contract Documents or in consequence of any legal proceedings or statutory liens, and less any amounts due the Contractor under the subcontract for work not performed or not properly or timely performed by the subcontractor. In the event any subcontractor is not paid by the Contractor, the former should immediately notify the University of such fact.
- (7) The Contractor shall execute with each of its subcontractors and shall require all subcontractors to execute with their sub-subcontractors a written agreement which shall bind the latter to the terms and provisions of this Agreement insofar as such terms and provisions are applicable to the work to be performed by such subcontractors. The Contractor shall require all subcontractors and sub-subcontractors to promptly, upon request, file with the Consultant and the University a conformed copy of such agreements, from which the price and terms of payment may be deleted.
- (8) If for sufficient reason, at any time during the progress of the work to be performed hereunder, the Consultant determines that any subcontractor or sub-subcontractor is incompetent, careless, or uncooperative, the Consultant will notify the Contractor accordingly and immediate steps will be taken by the Contractor for cancellation of such subcontract or sub-subcontract. Such termination, however, shall not give rise to any claim by the Contractor or by such subcontractor or sub-subcontractor for loss of prospective profits on work unperformed and/or work unfurnished and a provision to that effect shall be contained in all subcontracts and sub-subcontracts.
- (9) No provisions of this Agreement shall create or be construed as creating any contractual relation between the University and any subcontractor or sub-subcontractor or with any person, firm or corporation employed by, contracted with or whose services are utilized by the Contractor.

Section 2.19 Shop Drawings and Samples

- (1) The Contractor in accordance with the approved Shop Drawing, Submittal, Mockup, and Sample schedules and with such promptness and in such sequence as to cause no delay in the work, shall submit for the Consultant's approval all Shop Drawings and Samples called for under the Contract or requested by the Consultant.
- (2) Shop Drawings and mock-ups shall establish the actual detail of the work, indicate proper relation to adjoining work, amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions. Shop drawings include drawings, diagrams, schedules, product data and other information or materials specially prepared for the work by the Contractor to illustrate some portion of the work. Product data include standard illustrations, schedules, performance charts, instructions, brochures, diagrams and other information identified by the Contractor to illustrate materials or equipment for some portion of the work.
- (3) All Shop Drawings, mock-ups and samples shall be thoroughly checked by the Contractor for compliance with the Contract Documents before submitting them to the Consultant for approval and all Shop Drawings shall bear the Contractor's recommendation for approval. Any Shop Drawings submitted without this stamp of approval and certification, and Shop Drawings which, in the Consultant's opinion, are incomplete, contain numerous errors or have not been checked or only checked superficially, will be returned unchecked by the Consultant for resubmission by the Contractor. In checking Shop Drawings, the Contractor shall verify all dimensions and field conditions and shall check and coordinate the Shop Drawings of any section or trade with the requirements of

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all other sections or trades whose work is related thereto, as required for proper and complete installation and sequence of the work.

- (4) Samples must be of sufficient size or number to show the quality, type, range of color, finish and texture of the material. Each Sample shall be properly labeled to show the nature of the material, trade name of manufacturer, name and location of the work where the material represented by the Sample is to be used and the name of the Contractor submitting the Sample. Transportation charges to the Consultant must be prepaid on Samples forwarded to it.
- (5) At the start of the Project, the format for submittals shall be established by the University. If an electronic method is selected for the submission and approval of submittals, the Contractor shall provide submittals in a PDF format and the Consultant will return the submittals in electronic format to the Contractor. For both hard-copy and electronic submittal formats, all submittals that require physical samples or mock-ups shall be provided in accordance with the requirements set forth in the Contract Specifications. Shop Drawings and Samples, submitted by the Contractor in accordance with the approved Shop Drawing and Sample schedule that is included in the Time Progress Schedule, will be reviewed by the Consultant within fifteen (15) working days and if satisfactory will be approved. A Shop Drawing, when approved, will be returned to the Contractor. If not satisfactory, the Drawings and Samples will be appropriately marked and returned to the Contractor for correction thereof, in which event the Contractor shall resubmit to the Consultant a corrected copy of the Shop Drawing or a new Sample, as the case may be. The Contractor shall make any correction required by the Consultant and shall appropriately note any changes or revisions on the Shop Drawing, dated to correspond with the date of the Consultant's request for the change. Upon approval of the Shop Drawing by the Consultant, the Contractor shall promptly furnish to the Consultant as many copies thereof as the Consultant may reasonably request. Should more than two (2) separate reviews of any required shop drawings or samples submitted be necessary, in the judgement of the Consultant and the University, the Contractor shall be responsible for the reasonable costs incurred by the University for such additional reviews by the Consultant.
- (6) At the time of submission of a Shop Drawing or Sample, the Contractor shall inform the Consultant and the University in writing of any deviation in the Shop Drawing or Sample from the requirements of the Contract Documents. Unless such deviation is specifically noted by the Contractor with a notation that such deviation will result in extra work for which the Contractor requests payment, the Contractor shall be deemed to have waived any claim for extra work, additional compensation or payment or an extension of time with respect to all work shown on, described in or related to the Shop Drawing or Sample.
- (7) The Consultant's approval of Shop Drawings or Samples is for design only and is not a complete check on the method of assembly, erection or construction. Approval shall in no way be construed as: (a) permitting any departure whatsoever from the Contract Documents, except where the Contractor, in accordance with the provisions of paragraph 6 of this Section, has previously notified the University and the Consultant of such departure; (b) relieving the Contractor of full responsibility for any error in quality of materials, details, dimensions, omissions or otherwise that may exist; (c) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing or deficiencies in strength; (d) relieving the Contractor of full responsibility for satisfactory performance of all work and coordination with the work of all subcontractors and other contractors; or (e) permitting departure from additional details or instructions previously furnished by the Consultant.
- (8) No work requiring a Shop Drawing or Sample shall be commenced until a Shop Drawing or Sample is approved by the Consultant and all such work shall be: (a) in accordance with the approved Shop Drawing, provided the latter conforms in all respects to the Contract Documents or to such deviations therefrom as have been previously noted by the Contractor in accordance with the provisions of paragraph 6 of this Section; and (b) in conformance in all respects to the sample furnished to and approved by the Consultant and, unless otherwise specified, as new and of good quality.
- (9) The Contractor may be required to provide professional services that constitute the practice of architecture or engineering when specifically required by the Contract Documents for a portion of the work or the Contractor needs to provide such services in order to carry out its responsibilities for construction means, methods, techniques, sequences and procedures. When professional services are required in the Contract Documents, the Consultant will specify all performance and design criteria that such services must satisfy. The University

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and Consultant shall be entitled to rely on the adequacy, accuracy and completeness of the professional services, certifications, and approvals performed or provided by design professionals working for the Contractor.

- (10) Contractor agrees that the University may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University together with a markup upon such hard costs in the amount of 15% in the review or evaluation of any substitutions for methods, products or performance pursuant to this Section 2.19.

Section 2.20 Equivalents - Approved Equal

(1) Equivalents or Approvals - General

- a. The words "similar and equal to", or equal", "equivalent" and such other words of similar content and meaning shall for the purposes of this Agreement be deemed to mean similar and equivalent to one of the named products. For the purposes of subdivisions (1) and (2) of this Section and for the purposes of the Bidding Documents, the word "products" shall be deemed to include the words "articles", "materials", "items", "equipment" and "methods". Whenever in the Contract Documents one or more products are specified, the words "similar and equal to" shall be deemed inserted.
 - b. Whenever any product is specified in the Contract Documents by a reference to the name, trade name, make or catalog number of any manufacturer or supplier, the intent is not to limit competition, but to establish a standard of quality which the Consultant has determined is necessary for the Project. A Contractor may at its option use any product other than that specified in the Contract Documents provided the same is approved by the Consultant in accordance with the procedures set forth in subdivision (2) of this Section. In all cases the Consultant shall be the sole judge as to whether a proposed product is to be approved and the Contractor shall have the burden of proving, at its own cost and expense, to the satisfaction of the Consultant, that the proposed product is similar and equal to the named product. In making such determination the Consultant may establish such objective and appearance criteria as it may deem proper that the proposed product must meet in order for it to be approved.
 - c. Nothing in the Contract Documents shall be construed as representing, expressly or implied, that the named product is available or that there is or there is not a product similar and equal to any of the named products and the Contractor shall have and make no claim by reason of the availability or lack of availability of the named product or of a product similar and equal to any named product.
 - d. The Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Consultant in considering a product proposed by the Contractor or by reason of the failure of the Consultant to approve a product proposed by the Contractor.
 - e. Requests for approval of proposed equivalents will be received by the Consultant only from the Contractor.
 - f. Approval shall in no way be construed as: (a) permitting any departure whatsoever from the Contract Documents, (b) relieving the Contractor of full responsibility for any error in quality of materials, details, dimensions, sequence of work, omissions or otherwise that may exist, (c) relieving the Contractor of full responsibility for adequate field connections, erection techniques, bracing or deficiencies in strength, (d) relieving the Contractor of full responsibility for satisfactory performance of all work to achieve a functionally complete facility or result and coordination with the work of all subcontractors and other contractors or (e) permitting departure from additional details or instructions previously furnished by the Consultant.
 - g. Contractor agrees that the Contractor approves and authorizes the deduction from Contractor's applications for payment any and all costs incurred by the Construction Manager, Consultant, Design Professional or otherwise in evaluating Contractor's submissions under this Section 2.20, together with a markup upon such hard costs in the amount of 15%.
- (2) Equivalents or Approvals After Bidding
- a. Any and all submissions for "or equal" products which are submitted by the Contractor after award of the Contract must be made by the Contractor within ninety (90) calendar days after the date of award. Contractor agrees that it waives and relinquishes the right, claim or privilege, if any, to submit "or equal" proposals if such

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are made ninety (90) calendar days after the date of award of the Contract to the Contractor.

- b. Requests for approval of proposed equivalents will be considered by the Consultant after bidding only in the following cases: (a) the named product cannot be obtained by the Contractor because of strikes, lockouts, bankruptcies or discontinuance of manufacture and the Contractor makes a written request to the Consultant for consideration of the proposed equivalent within ten (10) calendar days of the date it ascertains it cannot obtain the named product; or (b) the proposed equivalent is superior, in the opinion of the Consultant, to the named product; or (c) the proposed equivalent, in the opinion of the Consultant, is equal to the named product and its use is to the advantage of the University, e.g., the University receives an equitable credit, acceptable to it, as a result of the estimated cost savings to the Contractor from the use of the proposed equivalent or the University determines that the Contractor has not failed to act diligently in placing the necessary purchase orders and a savings in the time required for the completion of the construction of the Project should result from the use of the proposed equivalent.
- c. Where the Consultant pursuant to the provisions of this subdivision approves a product proposed by a Contractor and such proposed product requires a revision or redesign of any part of the work covered by this Agreement, all such revision and redesign and all new Drawings and details required therefor shall be subject to the approval of the Consultant and shall be provided by the Contractor at its own cost and expense.

Where the Consultant pursuant to the provisions of this Section approves a product proposed by a Contractor and such proposed product requires a different quantity and/or arrangement of duct work, piping, wiring, conduit or any other part of the work from that specified, detailed or indicated in the Contract Documents, the Contractor shall provide the same at its own cost and expense.

- (3) Contractor agrees that the University may deduct from any application for payment made by the Contractor any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University, together with a markup upon such hard costs in the amount of 15%, in the consideration or evaluation of any substitutions for methods, products or performance pursuant to this Section 2.20.

Section 2.21 Patents, Trademarks and Copyrights

The Contractor acknowledges that the Contract consideration includes all royalties, license fees and costs arising from patents or trademarks in any way involved in the work; provided, however, that the Contract consideration shall not be deemed to have included therein any royalty, license fee or cost arising from a patent or trademark for a design prepared by the Consultant and neither the Contractor nor the University shall have any liability in connection therewith. Where the Contractor is required or desires to use any product, device, material or process covered by patent or trademark, the Contractor shall indemnify and save harmless the University and the State of New York from any and all claims, actions, causes of action or demands, for infringement by reason of the use of such patented product, device, material or process, and shall indemnify the University and the State of New York from any cost, liability, damage and expense, including reasonable attorneys' fees and court costs, which it may be obligated to incur or pay by reason of any claim or infringement at any time both before or after the University's final acceptance of all the work to be performed under the Contract.

Section 2.22 Possession Prior to Completion

If before the final completion of all the work it shall be deemed advisable or necessary by the University to take over, use, occupy or operate any part of the completed or partly completed work or to place or install therein equipment and furnishings, the University, upon reasonable written notice to the Contractor, shall have the right to do so and the Contractor will not in any way interfere therewith or object to the same. Such action by the University shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract Documents and the Contractor acknowledges that such action by the University does not in any way evidence the completion of the work or any part thereof or in any way signify the University's acceptance of the work or any part thereof. The Contractor agrees to continue the performance of all work covered by the Contract in a manner which will not unreasonably interfere with such takeover, use, occupancy, operation, placement or installation.

Section 2.23 Completion and Acceptance

(1) Partial Completion

If before the final completion of all the work any portion of the permanent construction has been satisfactorily completed and the same will be immediately useful to the University, the latter may, by written notice, advise the

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Contractor that it accepts such portion of the work. Such action by the University shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to any work not so completed and accepted. The partial completion of any portion of the Contractor's work by the University, the Campus or the Consultant, shall not impact the assessment of liquidated damages or actual costs for delays or disruption to the Project caused by the Contractor, its subcontractors or vendors.

(2) Substantial Completion

When all the Work covered by the Contract is substantially completed, as defined in Section 1.01, the Contractor shall give written notice thereof to the University and the Consultant. The latter will then promptly make an inspection of the work and, if they shall determine that all the work is substantially completed, they shall so advise the Contractor. Such action shall in no way affect the obligations of the Contractor under the terms and provisions of the Contract with respect to any uncompleted (including untested or deferred work), unaccepted or corrective work or in any way affect, limit or preclude the issuance by the Consultant, from time to time thereafter, of "Punch Lists", i.e., lists of uncompleted or corrective work which the Contractor is to promptly complete and/or correct. In the judgement of the University, should more than two (2) separate inspections of the Work be necessary, the Contractor agrees that the University may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University together with a markup upon such hard costs in the amount of 15% for all such additional inspections.

The Contractor must fully, completely and acceptably perform all Punch List work and any other work subsequently discovered remaining to be completed or corrected, within ninety (90) calendar days of Substantial Completion or within such other timeframe stipulated by the University or Consultant. Failure to complete the Punch List within the time so designated hereunder may be deemed default on the part of the Contractor.

(3) Final Completion and Acceptance

After the completion of all the work the Contractor shall give written notice to the University and the Consultant that all the work is ready for inspection and final acceptance. The University and the Consultant shall promptly make such inspection and, if they shall determine that all the work has been satisfactorily completed, the University shall thereupon by written notice advise the Contractor that it accepts such work. In the judgement of the University, should more than two (2) separate inspections of the Work be necessary, the Contractor agrees that the University may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University together with a markup upon such hard costs in the amount of 15% for all such additional inspections.

Section 2.24 Record Drawings

(1) At the start of the Project, the format for Record Drawings shall be established by the University. Prior to acceptance by the University of all work covered by the Contract, the Contractor shall furnish to the Consultant one (1) set of current Contract Drawings on which the Contractor has recorded, using colored pencil for hard copy format or electronic editing tool in contrasting color for electronic format, in a neat and workmanlike manner, all instances where actual field construction differs from work as indicated on the Contract Drawings. These "Record". Drawings shall show the following information: (a) all significant changes in plans, sections, elevations and details, such as shifts in location of walls, doors, windows, stairs and the like made during construction; (b) all significant changes in foundations, columns, beams, openings, concrete reinforcing, lintels, concealed anchorages and "knock-out" panels made during construction; (c) final location of electric panels, final arrangement of electric circuits and any significant changes made in electrical design as a result of Change Orders, Field Orders or job conditions; (d) final location and arrangement of all mechanical equipment and major concealed plumbing, including, but not limited to, supply and circulating mains, vent stacks, sanitary and storm water drainage; (e) final location and arrangement of all underground utilities, connections to building and/or rerouting of existing utilities, including, but not limited to, sanitary, storm, heating, electric, signal, gas, water and telephone; and (f) final make and model for all significant equipment and devices listed in the specifications. The Contractor shall also provide an electronic version as determined by the Consultant.

(2) Periodically during the work, the Consultant may request submission of a progress set of Record Drawings for review and advise the Contractor of errors or omissions, if any, that must be corrected or completed prior to final submission of the Record Drawings. Shop Drawings shall not be acceptable as Record Drawings.

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- (3) The Contractor shall submit the Record Drawings to the Consultant at least fifteen (15) days prior to the date of Substantial Completion. The Consultant will then review the Record Drawings and, if they shall determine that the Record Drawings represent the actual field construction being completed, they shall so advise the Contractor. If not satisfactory, the Record Drawings will be appropriately marked and returned to the Contractor for correction thereof, in which event the Contractor shall promptly correct and resubmit to the Consultant a corrected copy of the Record Drawings. Acceptance of the Record Drawings by the University is a condition precedent to the Contractor's entitlement to receive Final Payment.

Section 2.25 Guarantees

- (1) The Contractor, at the convenience of the University, shall remove, replace and/or repair at its own cost and expense any defects in workmanship, materials, ratings, capacities or characteristics occurring in or to the work covered by the Contract within one (1) year or within such longer period as may otherwise be provided in the Contract, the period of such guarantee to commence with the University's final acceptance of all work covered under the Contract or at such other date or dates as the University may specify prior to that time, and the Contractor, upon demand, shall pay for all damage to all other work resulting from such defects and all expenses necessary to remove, replace and/or repair such other work which may be damaged in removing, replacing or repairing the said defects. The obligations of the Contractor under the provisions of this paragraph or any other guarantee provisions of the Contract Documents are not limited to the monies retained by the University under the Contract.
- (2) Unless such removal, replacement and/or repair shall be performed by the Contractor within ten (10) working days after it receives written notice from the University specifying such defect, or if such defect is of such a nature that it cannot be completely removed, repaired and/or replaced within said ten (10) day period and the Contractor shall not have diligently commenced removing, repairing and/or replacing such defect within said ten (10) day period and shall not thereafter with reasonable diligence and in good faith proceed to do such work, the University may employ such other person, firm or corporation as it may choose to perform such removal, replacement and/or repair and the Contractor agrees, upon demand, to pay to the University all amounts which it expends for such work.

Section 2.26 Default of Contractor

- (1) In addition to those instances specifically referred to in other Sections hereof, the University shall have the right to declare the Contractor in default of the whole or any part of the work if:
- a. The Contractor becomes insolvent; or if
 - b. The Contractor makes an assignment for the benefit of creditors pursuant to the statutes of the State of New York; or if
 - c. A voluntary or involuntary petition in bankruptcy is filed by or against the Contractor; or if
 - d. A receiver or receivers are appointed to take charge of the Contractor's property or affairs; or if
 - e. The Contractor fails to commence work when notified to do so by the Consultant; or if
 - f. The Contractor shall abandon the work; or if
 - g. The Contractor shall refuse to proceed with the work or extra work when and as directed by the Consultant or the University; or if
 - h. The Contractor shall without just cause reduce its working force to a number which, if maintained, would be insufficient, in the opinion of the University, to complete the work in accordance with the approved time progress schedule, and shall fail or refuse to sufficiently increase such working force when ordered to do so by the Consultant; or if
 - i. The Contractor shall sublet, assign, transfer convey, or otherwise dispose of the Contract other than as herein specified; or if

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- j. The University shall be of the opinion that the Contractor is or has been unnecessarily or unreasonably or willfully delaying the performance and completion of the work, or the award of necessary subcontracts, or the placing of necessary material and equipment orders; or if
 - k. The University shall be of the opinion that the work cannot be completed within the time herein provided therefor or within the time to which such completion may have been extended; provided, however, that the impossibility of timely completion is, in the University's opinion, attributable to conditions within the Contractor's control; or if
 - l. The work is not completed within the time herein provided therefor or within the time to which the Contractor may be entitled to have such completion extended; or if
 - m. The University shall be of the opinion that the Contractor is or has been willfully or in bad faith violating any of the provisions of this Agreement;
 - n. The University shall be of the opinion that the Contractor is not or has not been executing the Contract in good faith and in accordance with its terms; or if
 - o. At any time during the period of the Agreement, insurance as required is not in effect or proof thereof is not provided to the University.
- (2) Before the University shall exercise its right to declare the Contractor in default by reason of the conditions set forth in the above items *a, b, c, d, e, f, g, h, i, j, k, l, m, n* and *o*, it shall give the Contractor three (3) working days' notice of its intention to declare the Contractor in default and unless, within such three (3) day period, the Contractor shall make arrangements, satisfactory to the University, to correct and/or eliminate the conditions set forth in the University's aforesaid notice, the Contractor may be declared in default at the expiration of such three (3) day period or at the expiration of such longer period of time as the University may determine.
- (3) The right to declare in default for any of the grounds specified or referred to shall be exercised by the University sending the Contractor a written notice setting forth the ground or grounds upon which such default is declared. Upon receipt of notice that it has been declared in default, the Contractor shall immediately discontinue all further operations under the Contract and shall immediately quit the site, leaving untouched all plant, materials, equipment, tools and supplies then on site.
- (4) The University, after declaring the Contractor in default, may then have the work completed by such means and in such manner, by contract, with or without public letting, or otherwise, as it may deem advisable, utilizing for such purpose such of the Contractor's plant, materials, equipment, tools and supplies remaining on the site, and also such subcontractors as it may deem advisable, or it may call upon the Contractor's surety at its own expense to do so.
- (5) In the event that the University declared the Contractor in default of the work or any part of the work, the Contractor, in addition to any other liability to the University hereunder or otherwise provided for or allowed by law, shall be liable to the University for any costs it incurs for additional architectural and engineering services necessary, in its opinion, because of the default and the total amount of liquidated damages from the date when the work should have been completed by the Contractor in accordance with the terms hereof to the date of actual completion of the work, both of which items shall be considered as expenses incurred by the University in completing the work and the amount of which may be charged against and deducted out of such monies as would have been payable to the Contractor or its surety if the work had been completed without a default.
- (6) If the University completes the work, the Consultant shall issue a certificate stating the expenses incurred in such completion, including the cost of re-letting. Such certificate shall be final, binding and conclusive upon the Contractor, its surety, and any person claiming under or through the Contractor, as to the amount thereof.
- (7) The expense of such completion, as so certified by the Consultant, shall be charged against and deducted out of such monies as would have been payable to the Contractor if it had completed the work; the balance of such monies, if any, subject to the other provisions of the Contract, to be paid to the Contractor without interest after such completion. Should the expense of such completion, so certified by the Consultant, exceed the total sum which would have been payable under the Contract if the same had been completed by the Contractor, any such excess shall be paid by the Contractor to the University upon demand.

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- (8) In the event the University shall determine to complete the work without calling upon the Contractor's surety to do so, the Contractor shall not be entitled, from and after the effective date of the declaration of the default, to receive any further payment under the Contract until the said work shall be wholly completed and accepted by the University.
- (9) In case the University shall declare the Contractor in default as to a part of the work only, the Contractor shall discontinue such part, shall continue performing the remainder of the work in strict conformity with the terms of the Contract, and shall in no way hinder or interfere with any other contractors or persons whom the University may engage to complete the work as to which the Contractor was declared in default.
- (10) The provisions relating to declaring the Contractor in default as to the entire work shall be equally applicable to a declaration of partial default, except that the University shall be entitled to utilize for completion of the part of the work as to which the Contractor was declared in default only such plant, materials, equipment, tools and supplies as had been previously used by the Contractor on such part.
- (11) In completing the whole or any part of the work, the Consultant and the University shall have the power to depart from, change or vary the terms and provisions of the Contract; provided, however, that such departure, change or variation is made for the purpose of reducing the time or expense of such completion. Such departure, change or variations, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Consultant's certificate of the cost of completion, nor shall it constitute a defense to any action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for its default.
- (12) The provisions of this Section shall be in addition to any and all other legal or equitable remedies provided by this Agreement and otherwise applicable by law.

Section 2.27 Termination for Convenience

- (1) The performance of work under this Agreement may be terminated by the University, in whole or in part, whenever the University shall determine that such termination is in the best interest of the University. Any such termination shall be effected by a notice in writing to the Contractor specifying the date upon which such termination shall become effective and the extent to which performance of the Contract shall be terminated. Such termination shall be effective on the date and to the extent specified in said notice.
- (2) Upon receipt of a notice of termination, and-except as otherwise directed in writing by the University, the Contractor shall:
- a. Discontinue all work and the placing of all orders for materials and facilities otherwise required for the performance thereof,
 - b. Cancel all existing orders and subcontracts to the extent such orders and subcontracts relate to the performance of work terminated by the notice of termination;
 - c. Take such action as may be necessary to secure to the University the benefits of any rights of the Contractor under orders or subcontracts which relate to the performance of work terminated by the notice of termination, including, but not limited to, the assignment to the University, in the manner and to the extent directed by the University, all the right, title and interest of the Contractor under the orders or subcontracts so terminated and cancelled. In the event of such assignment, the University shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination and cancellation of such orders and subcontracts;
 - d. Transfer title and deliver to the University, in accordance with the direction of the University, all materials, supplies, work in process, facilities, equipment, machines or tools produced as a part of or acquired by the Contractor in connection with the work terminated by said notice, and all plans, Drawings, Working Drawings, sketches, Specifications and information for use in connection therewith; provided, however, that the Contractor may retain any of the foregoing if it so elects and foregoes reimbursement therefor;

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- e. Take such action as may be necessary or as the Consultant or the University may prescribe for the protection and preservation of all property in the possession or control of the Contractor in which the University, under the provisions of the Contract, has or may acquire an interest.
- (3) Notwithstanding the foregoing, should the notice of termination relate to only a portion of the work covered by the Contract, the Contractor will proceed with the completion of such portions of the work as are not terminated.
- (4) The University will pay and the Contractor shall accept, in full consideration for the performance and completion of the portions of the work as are not terminated, a sum calculated by determining the percentage the portions of the work not terminated bear to the total amount of the work covered by the Contract, and by multiplying the Contract consideration by such percentage - the product thereof being the amount to be paid to the Contractor. The University shall determine the amount of such consideration in accordance with the foregoing.
- (5) Upon compliance by the Contractor with the foregoing provisions of this Section and subject to deductions for payments previously made, the University, for the portions of the work terminated, shall compensate the Contractor as follows:
- a. By reimbursing the Contractor for actual expenditures made with respect to such work, including expenditures made in connection with any portion thereof which may have been completed prior to termination, as well as expenditures made after termination in completing those portions of the work covered by the Contract which the Contractor may have been required by the notice of termination to complete. The University shall determine the allowability and amount of such expenditures.
 - b. By reimbursing the Contractor for all actual expenditures made, with the prior written approval of the University or pursuant to a court judgment, in settling or discharging any outstanding contractual obligations or commitments incurred or entered into by the Contractor in good faith with respect to the Contract and resulting from the termination thereof.
 - c. By reimbursing the Contractor for all actual expenditures made after the effective date of the notice of termination resulting from or caused by the Contractor taking necessary action or action prescribed by the Consultant or the University for the protection and preservation of all property in the possession or control of the Contractor in which the University, under the provisions of the Contract, has or may acquire an interest.
 - d. By paying the Contractor a markup, which is to be calculated in the same manner as that provided for in subdivision c of paragraph (1) of Sections 4.02 and 4.05A for extra work, on the foregoing expenditures, which markup is to cover the Contractor's overhead and profit; provided, however, that if it appears that the Contractor would have sustained a loss on the entire Contract had it been completed, said markup shall be reduced by one-third.
- (6) The sum of all amounts payable under this Section, plus the sum of all amounts previously paid by the University under the provisions of the Contract, shall not exceed the amount of the Contract consideration. In no event shall the Contractor be entitled to any payment for loss of anticipated profits on uncompleted work and the University shall not be liable for same.
- (7) Termination by the University under the provisions of this Section shall be without prejudice to any claims or rights which the University may have against the Contractor. The University may retain from the amount due to the Contractor under the provisions of this Section such monies as may be necessary to satisfy any claim which the University may have against the Contractor in connection with the Contract; provided, however, that the University's failure to retain such monies shall not be deemed a waiver of any of its rights or claims against the Contractor.
- (8) Notwithstanding the foregoing, where the Contractor and the Consultant can agree upon another method of determining the amount of the consideration to be paid to the Contractor under the provisions of this Section, such method, subject to the approval of the University, may, at the option of the University, be substituted for the method set forth above.

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Article III
Time of Performance

Section 3.01 Commencement, Prosecution and Completion of Work

- (1) The Contractor agrees that it will begin the work herein embraced upon receipt of notice to proceed, unless the University consents in writing, to begin at a different date, and that it will prosecute the same with such diligence that all work covered by the Contract shall be substantially completed and performed on or before the time specified on page one of the Agreement.
- (2) The Contractor further agrees that time is of the essence in this Agreement and that all the work shall be prosecuted in such manner and with sufficient plant and forces to complete all work timely.

Section 3.02 Time Progress Schedule

- (1) To show compliance with the requirements of Section 3.01 of the Agreement, provide and maintain a Time Progress Schedule in accordance with the General Requirements, Special Conditions, Section paragraph titled "Project Schedule". Unless otherwise accepted by the University, the Time Progress Schedule shall be strictly adhered to by the Contractor. The time for substantial completion shall be on or before the time specified on page one of the Agreement.
- (2) If through the fault of the Contractor or any subcontractor the Contractor shall fail to adhere to the time progress schedule, it must promptly adopt such other and additional means and methods of construction as will make up for the time lost and will assure completion in accordance with such schedule.
- (3) The failure of the Contractor to submit a Time Progress Schedule, the University's or the Consultant's acceptance of the Contractor's time progress schedule or lack of such acceptance, the means and/or methods of construction employed by the Contractor, including any revisions thereof, and/or its failure to revise the same shall not relieve the Contractor of its obligation to accomplish the result required by the Contract in the time specified on page one of the Agreement, nor shall the exercise of the Consultant's or the University's right to reject any portion of the work, create or give rise to any claim, action or cause of action, legal, equitable or otherwise, against the Consultant or the University.
- 4) The failure of the Contractor to submit and maintain a Time Progress Schedule in accordance with the General Requirements shall be deemed to be a waiver by the Contractor of all claims for additional compensation or damages as a result of any condition which is an alleged cause of delay in the completion of the work.

Section 3.03 Time Progress Schedule for Shop Drawings and Samples

The Contractor shall include activities for preparation and submission of all Shop Drawings, mock-ups and Samples in the Time Progress Schedule in Section 3.02.

Section 3.04 Notice of Conditions Causing Delay

- (1) Within ten (10) working days after the commencement of any condition which is causing or may cause delay in completion or require Contractor to request an extension of time, the Contractor must notify the Consultant and the University in writing of the effect, if any, of such condition upon the Time Progress Schedule, and must state why and in what respects, if any, the condition is causing or may cause such delay.
- (2) Contractor agrees that an express condition precedent to Contractor's entitlement to any extension of time on the project shall be full and complete compliance to the satisfaction of the University with the Contractor's obligations in Section 3.06, Contractor's Progress Reports. Failure to submit proper Contractor's progress reports in appropriate and timely fashion shall be deemed a waiver and relinquishment of any right, claim or privilege to obtain an extension of time for the performance of the Contractor's work.
- (3) Failure to strictly comply with this requirement may, in the discretion of the University, be deemed sufficient cause to deny any extension of time on account of delay in completion arising out of or resulting from any change, extra work, suspension, or other condition.
- (4) Except as otherwise set forth in this Section 3.04 all procedures set forth in Sections 2.02 and 2.03 of this Agreement shall be complied with by the Contractor. Furthermore, full and complete compliance with the

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requirements of this Article III is a condition precedent to the Contractor's entitlement to receive an extension of time.

Section 3.05 Extension of Time

- (1) Within ten (10) working days after the commencement of any condition which is causing or may cause the Contractor to incur, require or otherwise need an extension of time, the Contractor shall notify the Consultant and the University of such condition. Full and complete compliance with this paragraph 3.05(1) is a condition precedent to the Contractor obtaining an extension of time for performance of any portion or all of its work.
- (2) An extension or extensions of time for the completion of the work may be granted by the University subject to the provisions of this Section, but only upon written application therefor by the Contractor to the University and the Consultant.
- (3) An application for an extension of time must set forth in detail the source and the nature of each alleged cause of delay in the completion of the work, the date upon which each such cause of delay began and ended and the number of days of delay attributable to each of such causes. It must be submitted prior to completion of the work.
- (4) If such an application is made, the Contractor may be entitled to an extension of time for delay in completion of the work caused solely: (a) by the acts or omissions of the University, its trustees, officers, agents or employees; or (b) by the acts or omissions of other contractors, not including subcontractors of the Contractor, on this Project; or (c) by unforeseeable supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, acts of God or the public enemy, war or other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes).
- (5) The Contractor may, however, be entitled to an extension of time for such causes only for the number of calendar days of delay which the University may determine to be due solely to such causes, and then only if the Contractor shall have strictly complied with all of the requirements of this Section and Section 3.04. The University shall make such determination within ninety (90) calendar days after receipt of the Contractor's application for an extension of time; provided, however, said application complies with the requirements of this Section.
- (6) The Contractor shall not be entitled to receive a separate extension of time for each one of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the work as determined by the University, irrespective of the number of causes contributing to produce such delay. If one of several causes of delay operating concurrently results from any act, fault or omission of the Contractor or of its subcontractors or material-men and would of itself (irrespective of the concurrent causes) have delayed the work, no extension of time will be allowed for the period of delay resulting from such an act, fault or omission.
- (7) The granting of an application for an extension of time for causes of delay other than those herein referred to shall be entirely within the discretion of the University.
- (8) If the Contractor shall claim to have sustained any damages by reason of delays, extraordinary or otherwise, or hindrances which it claims to be due to any action, omission, direction or order by the University or the Consultant, the Contractor shall be entitled only to an extension of time as hereinabove provided and shall not have or assert any claim or prosecute any suit, action, cause of action or proceeding against the University based upon such delays or hindrances, unless such delays or hindrances were caused by the University's bad faith or its willful, malicious, or grossly negligent conduct, or un contemplated delays, or delays so unreasonable that they constitute an intentional abandonment of the Contract by the University, or delays resulting from the University's breach of a fundamental obligation of the Contract.
- (9) The Contractor shall not be entitled to an extension of time for the performance of any or all of the Work set forth in allowances to the Contract. All allowance work shall be performed in accordance with the Contractor's schedule.

Section 3.06 Contractor's Progress Reports

After commencement of the work the Contractor shall furnish the Consultant with written monthly reports setting forth the condition and progress of the work, the percentage of each part of the work that has been finished, those parts of

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the work which have been completed within the scheduled time and those parts of the work which have not been finished within the scheduled time, and the general progress of the work that is being performed away from the site and the approximate date when such work will be finished and delivered to the site. Contractor agrees that compliance with this Section 3.06 is an express condition precedent to the Contractor's right, claim or entitlement to obtain an extension of time for the performance of the Contractor's work. Failure to comply with this Section 3.06 shall be a waiver and relinquishment of all such rights, claims and privileges to request or obtain an extension of time for the performance of Contractor's work.

Article IV
Payment

Section 4.01 Compensation to Be Paid Contractor

The University shall pay to the Contractor and the latter shall accept as full and complete payment for the performance of this Agreement, subject to additions or deductions as provided herein, the sum of identified on page one of this agreement which sum is the amount of the Contract consideration.

Section 4.02 Value of Omitted and Extra Work

(1) The amount by which the Contract consideration is to be increased or decreased by any Change Order or Field Order shall be determined by the University by one or more of the following methods:

- a. By applying the applicable price or prices set forth on the attached Schedule "I" of this Agreement or by applying a unit price agreed to by both parties. Subject to the provisions of Section 4.04, this method must be used if the Contract Documents contain applicable unit prices.
- b. By estimating the fair and reasonable cost of: (i) labor, including all wages, required wage supplements and insurance required by law (workers' compensation, social security, disability, unemployment, etc.) paid to or on behalf of foremen, workers and other employees below the rank of superintendent directly employed at the site of the Project; (ii) materials; and (iii) equipment, excluding hand tools, which, in the judgment of the University, would have been or will be employed exclusively and directly on the omitted work or extra work, as the case may be; and, in the case of extra work, where the same is performed directly by the Contractor, by adding to the total of such estimated costs a sum equal to 15 percent thereof, but, where the extra work is performed by a subcontractor, by adding a sum equal to 15 percent of said costs for the benefit of such subcontractor, and by adding, for the benefit of the Contractor (no further allowance will be made where extra work is performed by the sub-subcontractor), an additional sum equal to 10 percent of the first \$10,000 of the above-estimated costs, including the subcontractor's percentage override, plus 5 percent of the next \$90,000 of the total of said items, plus 3 percent of any sum in excess of \$100,000 of the total of said items. There is no markup on the premium portion of overtime labor. For the purposes of the aforesaid percentage overrides, the words "extra work" shall be defined as a complete item of added, modified or changed work as described in the Consultant's written instructions to the Contractor. Such "extra work" may include the work of one or more trades and/or subcontractors or sub-subcontractors and shall include all labor, materials, plant, equipment, tools and all incidentals directly and/or indirectly necessary, related, involved in or convenient to the successful completion of the extra work item. Where the Consultant's aforesaid written instructions to the Contractor involve both an increase and a reduction in similar or related work, the above percentage overrides will be applied only on the amount, if any, the cost of the increased work exceeds the cost of the reduced work.

No overhead and profit shall be retained by the Contractor on the cost of work determined by the method provided in Subparagraph (1)a.

All profit, overhead and expense of whatsoever kind and nature, other than those set forth above in items (i) through (iii), of the Contractor, its subcontractors and sub-subcontractors, are covered by the aforesaid percentage overrides and no additional payment therefor will be made by the University.

- c. The University may make such cost estimate either before or after the extra work is completed by the Contractor. By determining the actual cost of the extra work in the same manner as in the above subdivision b except that actual costs of the Contractor shall be utilized in lieu of estimated costs. The University shall have the option to utilize this method provided it notifies the Contractor of its intent to do so prior to the time the Contractor commences performance of such extra work.

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- (2) Irrespective of the method used or to be used by the University in determining the value of a Change Order or Field Order, the Contractor, within fifteen (15) working days after a request for the same, must submit to the University and the Consultant a detailed breakdown of the Contractor's estimate of the value of the omitted and/or extra work in a format approved by the University.
- (3) Equipment Watch Rental Rate Blue Book (published online by Intertec Penton Media, Inc.) or other published rates as approved by the University in writing, will be utilized for the equipment rental pricing. For the purposes of paragraph (1) hereof, the cost of equipment shall be determined, irrespective of the actual price for any rental or actual cost associated with such equipment as follows: take the monthly rate listed in Equipment Watch and dividing the same by 176 hours to establish an hourly rate and then multiplying such hourly rate by the actual number of hours that the equipment was used. The Contractor will submit an actual rental invoice, or acceptable quotation from a bonafide equipment rental supplier for rented equipment when equipment is not owned by the Contractor. The equipment rental supplier cannot be an "affiliate" of the Contractor, nor in any way be related to the Contractor. If submitted invoices/quotations are acceptable to the University, the Contractor will be reimbursed the actual rental cost including sales tax and appropriate mark-up. If no listing of rates for an item of equipment is contained in Equipment Watch, the University shall determine the reasonable rate of rental of the particular item of equipment by such other means as it finds appropriate. The edition Equipment Watch to be used shall be that in effect on the date of the receipt of bids for this Agreement. None of the provisions of Equipment Watch shall be deemed referred to or included in this Agreement excepting only the aforesaid monthly rates. To the cost of equipment as determined above, there is to be added the actual cost of gasoline, oil, grease and maintenance required for operation of such equipment and, in the case of equipment utilized only for extra work when, in the opinion of the Consultant, suitable equipment therefor was not available on the site, the reasonable cost of transporting said equipment to and from the site. Notwithstanding the foregoing, if the Consultant should determine that the nature or size of the equipment used by the Contractor in connection with the extra work is larger or more elaborate, as the case may be, than the size or nature of the minimum equipment determined by the Consultant to be suitable for the extra work, the cost of equipment will not be based upon the equipment used by the Contractor but instead will be based on the smallest or least elaborate equipment determined by the Consultant to have been suitable for the performance of the extra work.
- (4) Unless otherwise specifically provided for in a Change Order or Field Order, the compensation specified therein for extra work includes full payment for both the extra work covered thereby and for any damage or expense caused the Contractor by any delays to other work to be done under the Contract resulting from or on account of said extra work, and the Contractor waives all rights to any other compensation for said extra work, damage or expense.

Section 4.03 Adjustment for Bond and Insurance Premiums

Upon final acceptance of the work to be performed under this Agreement, the University may adjust the Contract consideration to reflect any changes in the cost of all required Bonds and liability and builder's risk insurance premiums which the Contractor had to pay for on all extra work and would have had to furnish and pay for on all omitted work. Unless such cost is agreed upon by the University and the Contractor, the University may calculate and determine the amount of the adjustment in the Contract consideration by estimating such costs. There is no markup on bond or insurance premium adjustment.

Section 4.04 Unit Prices

- (1) Except as otherwise provided in the second paragraph of this Section, the unit prices, set forth on the attached Schedule "I" of this Agreement, will be binding upon both the University and the Contractor in determining the value of omitted and/or extra work, and, in the case of extra work, such unit prices shall be deemed to include all profit, overhead and expenses of whatsoever kind and nature of the Contractor, its subcontractors and sub-subcontractors, and the Contractor agrees that it shall make no claim for any profit, overhead, expense or percentage override in connection therewith.
- (2) Where said Schedule "I" sets forth a unit price for added and/or deducted work, the University shall have the option, whenever it is found that the quantity of changed work varies by more than 15 percent from the quantity that is stated or that can be determined by the Contract Documents at the time of execution thereof, to accept or reject such unit price for the quantity that the changed work varies by more than 15 percent from the stated or determinable quantity. Where a quantity is not specifically stated in the Contract Documents, the University's determination of the amount of said quantity included in the Contract Documents shall determine the applicability

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of this paragraph. Where the University, pursuant to the foregoing provisions, exercises its aforesaid option, the amount of the increase or decrease in the Contract consideration for the quantity of work which varies by more than 15 percent from the stated or determinable quantity shall be determined in accordance with the provisions of Section 4.02 of the Agreement as if there was no unit price therefor set forth in said Schedule "I".

Section 4.05 Allowances

- (1) The Contractor acknowledges that the Contract consideration includes the allowances set forth on the attached Schedule "II" and "III" of this Agreement and, except for quantitative and field order allowances, it agrees to cause the work covered thereby to be done by such contractors for such sums as the University may direct. Where cash allowances are provided, the allowances shall be deemed to include the purchase of the materials and/or equipment and the delivery of same to the job site. Unless otherwise specified in the Contract Documents, cash allowances do not include the proper installation of the materials and/or equipment or the connection for final utilities thereto; the cost of said installation and/or connection having been included in the amount of the Contract consideration.
- (2) The Contractor acknowledges that the Contract consideration includes such sums for expenses and profit on account of cash allowances as it deems proper and that it shall make no claim for expenses or profit or any percentage override in addition thereto; said items having been included in the amount of the Contract consideration.
- (3) In the event any of the cash allowances listed below are either higher or lower than the cost of having the work done in accordance herewith, the Contract consideration shall be adjusted to reflect such variance, the amount of said adjustment to be the difference between the amount of the allowance and the actual cost of performing the work covered thereby.
- (4) When quantitative allowances are provided, progress payments thereof to the Contractor will be based upon the applicable unit prices set forth on the attached Schedule "I" of the Agreement, subject, however, to the provisions of paragraph (2) of Section 4.04. In the event any of said quantitative allowances are more than or less than the actual quantity of work performed, the Contract consideration shall be adjusted to reflect such variance, the amount of said adjustment to be determined in accordance with the provisions of Sections 4.02, 4.04 and 4.05A of the Agreement.

Section 4.05A Field Orders

When the Agreement contains a Field Order Allowance, the bid shall include the amount of such allowance. Said amount shall cover the cost of additional labor, materials and time for contingent activities within the scope of the Agreement as directed and described by the University in writing in a Field Order. The Field Order will include a description of the work and the method for determining the value of such work. The value of the work directed under this allowance will be determined by one or more of the provisions of Section 4.02. If the net cost(s) of all Field Orders issued are more or less than the specified amount of the allowance, the Contract sum will be adjusted by Change Order.

Section 4.06 Deductions for Unperformed and/or Uncorrected Work

- (1) Without prejudice to any other rights, remedies or claims of the University, in the event that the Contractor at any time fails or neglects to supply working forces and materials of the proper quantity and quality necessary, in the opinion of the Consultant or the University, to comply with the approved time progress schedule, or fails in any respect to prosecute the work with promptness and diligence or causes by any action or omission the stoppage or delay of or interference with the work of any other contractor having a contract with the University, or fails in the performance of any obligations and responsibilities under this Agreement, then, and in that event, the University, acting itself or through the Consultant, may, upon three (3) working days' notice to the Contractor, either itself provide or have any other contractor, including but limited to the University's Job Order Contracting Program, provide any and all labor or materials or both necessary, in its opinion, to correct any aforesaid deficiency of the Contractor, and the University will thereafter backcharge the Contractor by issuing a Change Order reducing the amount of the Contract consideration for all costs and expenses it incurs in connection with the correction of such deficiency. The Contractor agrees that the University may deduct from any application for payment made by the Contractor, any and all Design Professional, Consultant and/or Construction Management fees and costs incurred by the University together with a markup upon such hard costs in the amount of 15% for services required in connection with the correction of such deficiency(ies).

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- (2) Notwithstanding any provisions in the Contract Documents to the contrary, if the University deems it inexpedient to correct work not done in accordance with the Contract or any work damaged as a result thereof, it shall notify the Contractor of such fact and the latter shall not remedy or correct the same. In such event, however, the amount of the Contract consideration shall be decreased by an amount, determined by the University, which is equal to the difference in value of the work as performed by the Contractor and the value of the work had it been satisfactorily performed in accordance with the Contract or which is equal to the cost of performing the corrective work, whichever shall be the higher amount.

Section 4.07 Liquidated Damages

In the event that the Contractor shall fail to substantially complete all the work within the time fixed for such completion on page one of this agreement, or within the time to which such completion may have been extended or in the event that the Contractor abandons the work and the same is not substantially completed within the aforesaid time for such completion, the Contractor must pay to the University as damages for each calendar day of delay in completing the work the amount set forth on page one of the Contractors proposal, as stated on page one of this agreement. . In view of the difficulty of accurately ascertaining the loss which the University will suffer by reason of delay in completion of the work hereunder, said sum is hereby fixed and agreed as liquidated damages which the University will suffer by reason of such delay and not as a penalty. The University may deduct and retain out of the monies which may become due hereunder to the Contractor the amount of any such liquidated damages and, in case the amount which may become due to the Contractor under the provisions of the Contract may be less than the liquidated damages suffered by the University, the Contractor shall pay the difference, upon demand, to the University.

Section 4.08 Contract Breakdown

Prior to the submission of its first application for a progress payment, the Contractor shall present to the University and the Consultant for their approval a detailed schedule showing the breakdown of the Contract consideration. The Contract Breakdown Summary shall be further broken down as required by the Consultant and the University. Such schedule must contain the amount estimated for each part of the work and quantity survey for each part of the work. It shall also list the estimated value of the Contractor's guarantee obligations under the provisions of the Contract Documents, which is hereby fixed at \$5,000 or one-half of one percent (1/2%) of the Contract award amount, whichever is the lesser sum. Such schedule shall be revised by the Contractor until the same shall be satisfactory to the University and the Consultant and shall not be changed after the University and the Consultant have approved the same. The amounts set forth in the schedule will not be considered as fixing the basis for additions to or deductions from the Contract consideration.

Section 4.09 Prompt Payment Requirements

- (1) For the purposes of Article XI-A of the State Finance Law, the campus for which the work is being performed is the University's designated payment office. Applications for payment must contain the approval of the Consultant before being submitted to the University.
- (2) Whenever the Consultant's approval of an application for payment is required under the Contract, the Consultant shall have fifteen (15) calendar days, after receipt of such application, to inspect the work before acting on the application.
- (3) Until such time that the Contract is approved by the University, the thirty (30) day period, referred to in Article XI-A of the State Finance Law for the payment of invoices without interest, shall not begin.

Section 4.10 Progress Payments

- (1) Unless otherwise provided in the Contract, progress payments will be made as the work progresses upon applications submitted by the Contractor and approved by the Consultant and the University. Payment of such approved applications shall be made by the University within thirty (30) days after such approval has been given.
- (2) The University shall make progress payments to the Contractor on the basis of such approved applications, less a retained amount equal to 5 percent thereof (i.e. retainage) , plus an amount necessary, in the University's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged, , together with any back charges and offsets which are deemed necessary or likely to be incurred by the University as a result of any failure by the Contractor to fully, completely, accurately and timely perform its work, which it shall reserve from each such payment until all of the work covered by the Contract has been completed.

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- (3) When the University and the Consultant have determined that all the work is substantially completed, or that a substantial portion of the permanent construction has been completed and accepted, the University shall make a progress payment to the Contractor, on the basis of an application submitted by the Contractor and approved by the Consultant and the University, which shall reduce the unpaid amount due to the Contractor under the terms of the Contract, including all monies retained by the University from previous progress payments to the Contractor, to an amount equal to two (2) times the cost, estimated by the Consultant, of performing, in accordance with the Contract, all uncompleted, unaccepted and corrective work, plus an amount necessary, in the University's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged. As the remaining items of work are satisfactorily completed or corrected, the University shall make progress payments to the Contractor, on the basis of applications submitted by the Contractor and approved by the University and the Consultant, covering said items of work less an amount necessary, in the University's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.

Section 4.11 Applications for Progress Payments

The Contractor shall prepare all applications for progress payments for work performed, together with supporting data and computations as are deemed necessary by the Consultant to determine the accuracy of the application. The application for payment and all required supporting documentation shall be submitted using the University's prescribed forms. The Contractor shall include with such applications reports detailing actual payments to minority and women-owned businesses who participate on University projects. Failure of the Contractor to submit applications for progress payments, or lack of complete and accurate supporting data, shall be sufficient reason for withholding payment until such omissions or errors are rectified. Unless otherwise directed, such applications, signed and certified as correct by the Contractor, shall be delivered by the Contractor to the Consultant once each month showing the total value of work completed and in place on the last day of the payment period covered by the application.

Section 4.12 Progress Payments for Materials Delivered to Site

- (1) Progress payments made in accordance with Section 4.10 shall include a payment for materials and equipment to be furnished and installed under the Contract, after such materials and equipment have been delivered and accepted at the site of the work.
- (2) Materials and equipment for which such progress payment has been made shall not be removed from the site, shall be stored until incorporated into the work in a location approved by the Consultant and shall be adequately protected from fire, theft and vandalism, the effects of the elements and any other damage whatsoever, and shall at all times be available for inspection by the Consultant and the University.

Section 4.13 Transfer of Title to Materials Delivered to Site

Title to all supplies and materials to be furnished or provided by the Contractor to the University pursuant to the provisions of the Contract Documents shall immediately vest in and become the sole property of the University upon delivery of such supplies and materials to the site. Notwithstanding such transfer of title, the Contractor shall have the full continuing responsibility to install such materials and supplies, protect them, maintain them in proper condition and forthwith repair, replace and make good any damage thereto without cost to the University until such time as the work covered by the Contract is fully accepted by the University. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract. In the event that, after title has passed to the University, any of such supplies and materials are rejected as being defective or otherwise unsatisfactory, title to all such supplies and materials shall be deemed to have been transferred back to the Contractor.

Section 4.14 Progress Payments for Materials Stored Off Site

- (1) Progress payments made in accordance with Section 4.10 shall include a payment for materials and equipment which are in short and/or critical supply or have been specially fabricated for the Project. Materials and equipment, for which a progress payment is made pursuant to the preceding sentence, shall be stored by the Contractor, after fabrication, until such time as their delivery to the site is required, at a facility and location approved by the Consultant; shall be adequately protected from fire, theft and vandalism, the effects of the elements and any other damage whatsoever; and shall at all times be available for inspection by the Consultant and the University. No progress payment shall, however, be made for said materials and equipment until:
- a. The Contractor furnishes to the University a bill of sale listing quantity and costs of said materials and equipment f.o.b. point of origin;

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- b. The Consultant shall have inspected said materials and equipment and recommended payment therefor; and
 - c. The Contractor furnishes to the University a builder's risk insurance policy, with the broad form extended coverage endorsement, for said materials and equipment, in an amount equal to 100 percent of the value thereof, which policy shall be maintained, at the sole cost and expense of the Contractor, until said materials and equipment have been incorporated into the Project. The said insurance policy shall contain a provision that the loss, if any, is to be made adjustable with and payable to the University as trustee for the insured, i.e., the University and the Contractor, and a provision that it shall not be changed or cancelled and that it will be automatically renewed upon expiration and continued in force unless the University is given thirty (30) days written notice to the contrary.
 - d. The Contractor shall develop and provide a preventive maintenance log for stored equipment when determined appropriate by the Consultant. The Contractor shall provide timely notification and opportunity for the Consultant and the University to view the Contractor's preventative maintenance efforts.
- (2) Materials and equipment for which a progress payment has been made by the University pursuant to this Section shall be, become and remain the sole property of the University; provided, however, that the Contractor shall have the full continuing responsibility to install such materials and equipment, to deliver it to the site, to protect it, to maintain it in proper condition and to forthwith repair, replace and make good any damage thereto without cost and/or additional time to the University until such time as the work covered by the Contract is fully accepted by the University. Such transfer of title shall in no way affect any of the Contractor's obligations under the Contract.

Section 4.15 Withholding of Progress Payments

Notwithstanding anything contained in the Contract to the contrary, the University may withhold payment of all or any part of a progress, final or guarantee payment, in such an amount as it may deem proper to enforce the provisions of the Contract and to satisfy the claims of third parties, when:

- a. The University shall learn of any claim, of whatsoever nature or kind, against the University or the Contractor, which in any way arises or is alleged to arise out of or as a result of or in connection with the performance by the Contractor of the work covered by the Contract or out of or in connection with the Contractor's operations or performance at or in the vicinity of the construction site, that, in the opinion of the University, may not be adequately covered by insurance.

If an action on such claim is timely commenced and the liability of the University and/or the Contractor shall have been established therein by a final judgment of a court of competent jurisdiction, or if such claim shall have been admitted by the Contractor to be valid, the University shall pay such judgment or admitted claim out of the monies retained by it under the provisions of the Contract and return the balance, if any, without interest, to the Contractor.

The University may withhold from the Contractor any payments retained by it until such time as all such claims are either satisfied or barred by law from being presented. At such time the University, upon written demand by the Contractor, shall return to the Contractor the amount so withheld, without interest.

- b. The Contractor has not complied with any lawful or proper direction of the Consultant or the University or their representatives concerning the work covered by the Contract or the performance of the Contract or the production of records as required under the provisions of the Contract.
- c. There exists any of the conditions, listed in Section 2.26, which would allow the University to declare the Contractor in default of the whole or any part of the work.
- d. The Contractor is a foreign contractor and has not furnished satisfactory proof that all taxes due by such Contractor under the provisions of the Tax Law have been paid. The Certificate of the New York State Tax Commission to the effect that all such taxes have been paid shall be conclusive proof of the payment of such taxes. The term "foreign contractor" as used herein means, in the case of an individual, a person who is not a resident of the State of New York; in the case of a partnership, one having one or more partners not a resident of the State; and in the case of a corporation, one not organized under the laws of the State of New York.

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- e. The Contractor, upon request of the University at any time after the initial progress payment by the University to the Contractor, fails to furnish the University with such documentary evidence that the University may deem necessary to prove to it that material and labor paid for by the University under previous applications for payment submitted have been paid for by the Contractor and that there are no outstanding claims or liens in connection therewith or fails to satisfy the University that the Contractor, with good cause, has sufficiently provided for the payment and/or satisfaction of claims for said material and labor.

Section 4.16 Lien Law

The attention of the Contractor is specifically called to the provisions of the Lien Law of the State of New York, wherein funds received by a Contractor for a public improvement are declared to constitute trust funds in the hands of such Contractor to be applied first to the payment of certain claims.

Section 4.17 Substitution of Securities for Retainage

Any time after 50 percent of all the work has been completed, the University, if the progress and performance of the work is satisfactory to it, on request of the Contractor, will allow the Contractor to withdraw up to 50 percent of the aforesaid amount retained by the University by depositing with the Comptroller of the State of New York government securities, of the type and kind specified in Section 139 of the State Finance Law, having a market value not exceeding par, at the time of deposit, equal to the amount so withdrawn. The Comptroller of the State of New York shall, from time to time, collect all interest or income on the obligations so deposited, and shall pay the same, when and as collected, to the Contractor. If the deposit be in the form of coupon bonds, the coupons as they respectively become due shall be delivered to the Contractor; provided, however, that the Contractor shall not be entitled to interest or coupons or income on any of the deposited securities, the proceeds of which have or will be used or applied by the University. In the event that the Contractor does not, in accordance with the terms and provisions of the Contract, comply with and fulfill all of its obligations and responsibilities thereunder, the Comptroller of the State of New York shall have the right to sell, assign, transfer or otherwise dispose of the aforesaid securities and the University shall have the right to use and apply all or any part of the monies obtained by the Comptroller of the State of New York from such a sale, assignment, transfer or disposition or from the collection of interest or income from said securities to the performance and fulfillment of said obligations and responsibilities. Notwithstanding the foregoing, when the University makes a payment under Section 4.10 (3) of the Agreement, it will return to the Contractor, as part of such payment, its substituted securities, and thereafter all retention of the University shall be in funds and not in substituted securities.

Section 4.18 Final Payment

Upon acceptance of all the work, except for the Contractor's guarantee obligations under Section 2.25 of the agreement and the Contractor's guarantee obligations under any provision of the Specifications, the Contractor shall prepare and submit to the University and the Consultant, for their approval, a final application for payment, which the University, within thirty (30) days after its approval of same, shall pay. Such application and payment shall be in an amount equal to 100 percent of the Contract consideration excluding the Contractor's guarantee obligations, less:

- a. All previous payments by the University to the Contractor;
- b. All deductions authorized to be made by the University under the Contract; and
- c. An amount necessary, in the University's judgment, to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged.
- d. The Contractor shall not be entitled to any interest on the monies retained by the University pursuant to Subdivision c of Section 4.18 of the Agreement.

Section 4.19 Acceptance of Final Payment

- (1) The acceptance by the Contractor, or by any one claiming by or through it, of the final payment shall, except with respect to the amount retained by the University pursuant to the provisions of subdivisions b and c of Section 4.18 of the Agreement, constitute and operate as a release to the University from any and all claims of any liability for anything theretofore done or furnished for or relating to or arising out of the work covered by the Contract and for any prior act, neglect or default on the part of the University or any of its trustees, officers, agents or employees in connection therewith.

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- (2) Should the Contractor refuse to accept the final payment as tendered by the University or should the Contractor refuse to execute the final application for payment without protest and without reserving any rights or claims against the University, it shall constitute a waiver of any right to interest on the amount of the payment so tendered and/or on the amount set forth in said final application for payment.

Section 4.20 Guarantee Payment

- (1) Subject to the provisions of the second paragraph of this Section, at the expiration of one (1) year after the University has accepted all the work covered by the Contract, the Contractor shall prepare and submit to the University and the Consultant, for their approval, a guarantee application for payment, which the University, within thirty (30) days after its approval of same, shall pay. Such application and payment shall be in an amount equal to the monies retained by the University for the Contractor's guarantee obligations under the Agreement, less any monies deducted by the University under this Section. The Contractor shall not be entitled to any interest on the monies retained by the University pursuant to subdivision c of Section 4.18 of the Agreement.
- (2) In the event the Contractor does not, in accordance with the terms and provisions of the Contract, complete all corrective work or comply with and fulfill its contractual obligations, the University may use and apply all or any part of the monies retained by it to have such work or obligations performed or fulfilled by a person, firm or corporation other than the Contractor. The obligations of the Contractor, under the terms and provisions of the Contract, shall not, however, be limited to the monies retained by the University pursuant to the provisions of the Contract.
- (3) No payments may be made under this agreement for work completed more than 365 days after the completion date listed on page one of this agreement unless the date/duration listed on page one of this agreement, is extended in writing by the University.

Section 4.21 Acceptance of Guarantee Payment

The acceptance by the Contractor or by anyone claiming by or through it, of the guarantee payment shall constitute and operate as a release to the University from any and all claims in connection with monies retained by the University. Should the Contractor refuse to accept the guarantee payment as tendered by the University or should the Contractor refuse to execute the guarantee application for payment without protest and without reserving any rights or claims against the University, it shall constitute a waiver of any right to interest on the amount of the payment so tendered and/or on the amount set forth in said guarantee application for payment.

Section 4.22 Contractor Limited to Money Damages

Inasmuch as the Contractor can be compensated adequately by money damages for any breach of the Contract which may be committed by the University, the Contractor agrees that no default, act or omission of the University shall constitute a material breach of the Contract entitling it to cancel or rescind the same or to suspend or abandon performance thereof; and it hereby waives any and all rights and remedies to which it might otherwise be or become entitled to because of any wrongful act or omission of the University or its representatives, saving only its right to money damages.

Section 4.23 No Estoppel or Waiver

- (1) The University shall not be precluded or estopped by any inspection, acceptance, application for payment or payment, final or otherwise, issued or made under the Contract or otherwise issued or made by it, the Consultant, or any trustee, officer, agent or employee of the University, from showing at any time the true amount and character of the work performed, or from showing that any such inspection, acceptance, application for payment or payment is incorrect or was improperly issued or made; and the University shall not be precluded or estopped, notwithstanding any such inspection, acceptance, application for payment or payment, from recovering from the Contractor any damages which it may sustain by reason of any failure on its part to comply strictly with the Contract and any monies which may be paid to it or for its account in excess of those to which it is lawfully entitled.
- (2) Neither the acceptance of all or any part of the work covered by the Contract; nor any payment therefor; nor any order or application for payment issued under the Contract or otherwise issued by the University, the Consultant, or any trustee, officer, agent or employee of the University; nor any permission or direction to continue with the performance of the Contract before or after its specified completion date; nor any performance by the University of any of the Contractor's duties or obligations; nor any aid lent to the Contractor by the University in its

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performance of such duties or obligations; nor any delay or omission by the University to exercise any right or remedy accruing to it under the terms of the Contract or existing at law or in equity or by statute or otherwise; nor any other thing done or omitted to be done by the University, its trustees, officers, agents or employees; shall be deemed to be a release to the Contractor or its sureties from any obligations, liabilities or undertakings in connection with the Contract or the Performance Bond or a waiver of any provision of the Contract or of any rights or remedies to which the University may be entitled because of any breach thereof, excepting only a written instrument expressly providing for such release or waiver. No cancellation, rescission or annulment hereof, in whole or as to any part of the Contract, because of any breach hereof, shall be deemed a waiver of any money damages to which the University may be entitled because of such breach. No waiver by the University of any breach of the Contract shall be deemed to be a waiver of any other or any subsequent breach.

Section 4.24 Limitation of Actions

- (1) No action or proceeding shall be maintained by the Contractor, or anyone claiming under or through the Contractor, against the University, or its trustees, officers, agents or employees, upon any claim arising out of or based upon the Contract or any breach thereof or by reason of any act or omission or requirement of the University, or its trustees, officers, agents or employees, unless:
- a. Such action or proceeding shall be instituted in the Court of Claims in the State of New York.
 - b. The Contractor or the person claiming under or through it shall have strictly complied with all requirements relating to the giving of notices and information with respect to such claims; and shall have provided the University with an electronic version of any claims, including all required information and copies of all contractually required notices that the Contractor provided to the University and the Consultant throughout the duration of the Contract ;
 - c. Such action or proceeding by the Contractor shall be commenced within eighteen months after the date of substantial completion set by the University or its Consultant and issued in writing to the Contractor. Any action or proceeding not commenced within this time frame shall be dismissed with prejudice.
 - d. If the Contract is terminated or the Contractor declared in default by the University, such action is commenced within six (6) months after the date of such termination or declaration of default by the University.
 - e. The Parties shall use good faith efforts to amicably resolve any dispute arising under this Agreement. If the Parties are unable to amicably resolve the dispute within thirty (30) days, then either Party may seek legal or equitable redress.
- (2) Notwithstanding anything in the laws of the State of New York to the contrary, the Contractor, or anyone claiming under or through the Contractor, shall not be entitled to any additional time to begin anew any other action if an action commenced within the times herein specified is dismissed or discontinued for any reason whatsoever.

Section 4.25 Electronic Payments

The Contractor shall provide complete and accurate payment applications in order to receive payment. Payment applications submitted must contain all information and supporting documentation required by the University. Payment for applications submitted by the Contractor shall only be rendered electronically unless payment by paper check is expressly authorized by the University's sole discretion, due to extenuating circumstances. Such electronic payment shall be made in accordance with ordinary State procedures and practices. The Contractor shall comply with the State Comptroller's procedures to authorize electronic payments. Authorization forms are available at the Office of the State Comptroller's website at www.osc.state.ny.us/epay/index.htm; by email at epunit@osc.state.ny.us; or by telephone at 518-474-4032. The Contractor acknowledges that it will not receive payment on any invoices submitted under this Agreement if it does not comply with the State Comptroller's electronic payment procedures, except where the University has expressly authorized payment by paper check as set forth above.

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Article V
Protection of Rights and Property

Section 5.01 Accidents and Accident Prevention

The Contractor shall at all times take reasonable precautions for the safety of persons engaged in the performance of the work. The Contractor shall comply fully with all applicable provisions of the laws of the State of New York and OSHA and with all valid rules and regulations thereunder. The Contractor's attention is specifically called to the applicable rules and regulations, codes and bulletins of the New York State Department of Labor.

Section 5.02 Adjoining Property

The Contractor shall be required to protect all the adjoining property and to repair or replace any such properties damaged or destroyed by it, its employees or subcontractors through, by reason of or as a result of activities under, for or related to the Contract.

Section 5.03 Emergencies

- (1) In case of an emergency which threatens loss or injury to persons or property, the Contractor will be allowed to act, without previous instructions from the Consultant or the University, in a diligent manner, to the extent required to avoid or limit such loss or injury, and it shall notify the Consultant and the University immediately thereafter of the action taken by it and of such emergency. Where the Contractor has not taken action but has notified the Consultant or the University of an emergency which threatens loss or injury to persons or property, it shall act in accordance with the instructions and/or authorization by the Consultant or the University.
- (2) In the event that the Contractor performs extra work in accordance with the preceding paragraph, it will be compensated therefor in accordance with the provisions of Section 4.02.

Section 5.04 Fire Safety

- (1) If the existing building is to be partially occupied during the course of the project, all existing exits except those shown for closure, fire walls, fire barriers and fire protection systems shall be continuously maintained in the occupied phases in compliance with the Fire Code of New York State and as required by NFPA 241 and as recommended in its Annex A, Explanatory Material, or other measures must be taken which in the opinion of the Consultant will provide equal safety. Those portions occupied by the campus must be available for their use 24 hours a day, seven days a week during the contract period unless otherwise scheduled in these documents. Comply with all applicable State and Federal codes and regulations. Prior to removal of existing fire walls, fire barriers and fire protection systems, if such removal is part of the work, install equivalent temporary fire walls, fire barriers and fire protection systems. The cost of all labor, fire watches, variances, materials, installations, maintenance and removal of such temporary fire protection systems or modifications to the existing systems are the responsibility of the Contractor. Install permanent fire walls, fire barriers and fire protection systems, if provided as part of the work, as soon as practical and as required by NFPA 241 and as recommended in its Annex A, Explanatory Material.
- (2) Solid fuel salamanders and heaters shall not be used by the Contractor or any of its subcontractors. All other salamanders used by the Contractor or any of its subcontractors shall require constant attendance of competent persons on each floor where in use.
- (3) All temporary fabric used by the Contractor or any of its subcontractors for curtains or awnings shall be either non-combustible or flame retarded so that it will not burn or propagate flame.

Section 5.05 Risks Assumed by Contractor

- (1) To the fullest extent permitted by law, the Contractor solely assumes the following distinct several risks whether they arise from acts or omissions (whether negligent or not and whether supervisory or otherwise) of the Contractor, of the University, of third persons or from any other cause, including unforeseen obstacles and difficulties which may be encountered 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 State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York or the State University of New York, excepting only risks which arise from defects in maps, plans, designs or Specifications prepared, acquired or used by the Consultant or the University, from the negligence of the University, its agents or employees or from affirmative acts of the, State University Construction Fund, the Dormitory Authority of the State

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of New York, the State of New York or the State University of New York or their trustees, officers, agents or employees committed with intent to cause the loss, damage and injuries herein below set forth:

- a. The risk of loss or damage, direct or indirect, to the work covered by the Contract or to any plant, equipment, tools, materials or property furnished, used, installed or received by the University or by the Contractor or any subcontractor, material man or worker performing services or furnishing materials for the work covered hereunder. The Contractor shall bear such risk of loss or damage until the work covered by the Contract has been finally accepted by the University or until completion of removal of such plant, equipment, tools, materials or property from the construction site and the vicinity thereof, whichever event occurs last. In the event of such loss or damage, the Contractor shall forthwith repair, replace and/or make good any such loss or damage without cost to the University.
 - b. The risk of claims, just or unjust, by third persons against the Contractor, the State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York, or the State University of New York on account of wrongful death, bodily injuries and property damage, direct or consequential, loss or damage of any kind whatsoever arising or alleged to arise out of or as a result of or in connection with the performance by the Contractor of the work covered by the Contract (whether actually caused by or resulting from the performance of the Contract) or out of or in connection with the Contractor's operations or presence at or in the vicinity of the construction site.
- (2) To the fullest extent permitted by law, the Contractor shall indemnify and save harmless the State University Construction Fund the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees against all claims described above and for all costs and expenses incurred by them in the defense, settlement or satisfaction thereof, including attorneys' fees and court costs. If so directed, the Contractor shall at its own expense defend against such claims, in which event it shall not, without obtaining express advance permission from Counsel of the University, raise any defense involving in any way jurisdiction of the tribunal over the University, governmental nature of the University or the provisions of any statutes respecting suits against the University.
- (3) Neither the University's final acceptance of the work to be performed hereunder nor the making of any payment shall release the Contractor from its obligations under this Section. 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.

Section 5.06 Compensation and Liability Insurance

- (1) General Requirements
- a. Prior to the commencement of the work to be performed by the Contractor, the Contractor shall procure at its sole cost and expense, and maintain in force at all times during this Agreement until Final Payment and as further required by the Contract, policies of insurance as herein set forth below. All insurance shall be written by insurance carriers approved by the University, licensed to do business in the State of New York ("admitted" carriers), and rated at least "A-" by A.M. Best Company.
 - b. Prior to the commencement of the work, the Contractor shall submit to the University, certificates of insurance, in a form acceptable to the University, showing evidence of compliance with all insurance requirements contained in this Agreement. Certificates of Insurance (with the exception of Workers' Compensation and Disability) must be provided on an ACORD 25 Certificate of Insurance, or an equivalent form. Certificates of Insurance shall disclose any deductible, self-insured retention, aggregate limit or any exclusion to the policy that materially changes the coverage required by the Contract; specify the additional insureds and named insureds as required herein; and be signed by an authorized representative of the insurance carrier or producer. Deductibles or self-insured retentions above \$25,000 are subject to approval by the University and additional security may be required. Certificates shall reference the Contract number. Only original documents will be accepted.
 - c. All insurance shall provide that the required coverage apply on a primary and not on an excess or contributing basis as to any other insurance that may be available to the University for any claim arising from the Contractor's

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work under this Agreement, or as a result of Contractor's activities. Any other insurance maintained by the University shall be in excess of and shall not contribute with the Contractor's insurance, regardless of the "other insurance" clause contained in the University's own policy of insurance. A copy of the endorsement reflecting this requirement may be requested by the University.

- d. Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the University with updated replacement certificates of insurance and endorsements. The Contractor shall advise the University of any letter or notification that cancels, materially changes, or non-renews the policy and Contractor shall require the insurance carrier(s) to copy the University on any letter or notification that cancels, materially changes, or non-renews the policy. If, at any time during the period of the Agreement, insurance as required is not in effect, or proof thereof is not provided to the University, the University shall have the options to (i) direct the Contractor to stop work with no additional cost or extension of time due on account thereof; or (ii) treat such failure as an event of default under Section 2.26 of the Agreement. At any time the coverage provisions and limits of the policies required herein do not meet the provisions and limits set forth in the Agreement the Contractor shall immediately cease Work on the Project. The Contractor shall not resume Work on the Project until authorized to do so by the University. Any delay or time lost as a result of the Contractor not having insurance required by the Agreement shall not give rise to a delay claim or any other claim against the University. If required by the University, Contractor shall deliver to the University within forty-five (45) days of such request, a copy of any or all policies of insurance not previously provided, certified by the insurance carrier as true and complete.
 - e. Should the Contractor engage a subcontractor, the Contractor shall impose the insurance requirements of this document on those entities, as applicable. Required insurance limits should be determined commensurate with the work of the subcontractor. Contractor shall keep the subcontractor certificates of insurance on file and produce them upon the demand of the University.
 - f. The aggregate insurance limits set forth herein shall apply separately to each contract for which a certificate of insurance and/or policy is issued.
 - g. Unless otherwise agreed to in writing by the University, policies must be endorsed to provide that there shall be no right of subrogation against the University. To the extent that any of the policies of insurance prohibit such a waiver of subrogation, Contractor shall secure the necessary permission to make this waiver.
 - h. Except as otherwise specifically provided herein or agreed in writing, policies must be written on an occurrence basis. The insurance policy(ies) shall name the State University Construction Fund, State University of New York, State of New York, its officers, agents, and employees as additional insureds thereunder. The additional insured requirement does not apply to Workers' Compensation or Disability coverage. Include ISO Endorsement CG 20 10 11 85 or its equivalent.
- (2) Specific Coverage and Limits

The Contractor shall obtain and maintain in full force and effect, the following insurance with limits not less than those described below and as required by the terms of the Contract, or as required by law, whichever is greater:

- a. Commercial General Liability Insurance. A Commercial General Liability insurance policy with coverage that shall include, but not be limited to coverage for bodily injury, property damage, personal/advertising injury, premises liability, independent contractors, blanket contractual liability including tort liability of another assumed in Contract, liability arising from all work and operations under this Agreement, defense and indemnification obligations, including those assumed under Contract, cross liability coverage for additional insureds, products/completed operations for a term no less than three years commencing upon acceptance of the work, explosion, collapse, and underground hazards, contractor means and methods, and liability resulting from Section 240 or Section 241 of the NYS Labor Law. The limits under such policy shall not be less than **\$2,000,000 each occurrence; \$2,000,000 general aggregate; and products/completed operations with an aggregate limit of \$2,000,000.**
- b. Workers Compensation and Disability Benefits as required by New York State.

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- c. Comprehensive Business Automobile Liability Insurance. A policy with a combined single limit for bodily injury and property damage of no less than \$1,000,000 covering liability arising out of the use of any motor vehicle in connection with the work, including owned, leased, hired, and non-owned vehicles bearing, or, under the circumstances under which they are being used, required by the Motor Vehicle Laws of the State of New York to bear license plates. If the Contract involves the removal of hazardous waste from the project site or otherwise transporting hazardous materials, pollution liability coverage for covered autos shall be provided by form CA 99 48 03 06 or CA 00 12 03 06 and the Motor Carrier Act Endorsement (MCS90) shall be attached.
- d. Umbrella and Excess Liability. When the limits of the Commercial General Liability, Auto, and/or Employers Liability policies procured are insufficient to meet the limits specified, the Contractor shall procure and maintain Commercial Umbrella and/or Excess Liability policies with limits in excess of the primary, provided, however, that the total amount of insurance coverage is at least equal to the requirements set forth above. Such policies shall follow the same form as the primary. Any insurance maintained by the University or additional insured shall be considered excess of and shall not contribute with any other insurance procured or maintained by the Contractor including primary, umbrella and excess liability regardless of the "other insurance" clause contained in either party's policy.
- e. Owner's Protective Liability Insurance. A policy issued to and covering the liability for damages imposed by law upon the State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, with respect to all operations under the Contract by the Contractor and its subcontractors, and/or their interest in the Project and the property upon which work under the Contract is to be performed, including omissions and supervisory acts of the former. Said insurance policy limits shall be no less than \$1,000,000 each occurrence and \$2,000,000 general aggregate.
- f. Asbestos Abatement Insurance. A liability insurance policy issued to and covering the liability, of the Contractor and/or subcontractor engaged in the removal, handling or wrapping of asbestos, if any of such work is to be performed under the Contract, for bodily injury, illness, sickness or property damage caused by exposure to asbestos in an amount not less than \$1,000,000 per occurrence and \$2,000,000 aggregate. The Contractor and/or its aforesaid subcontractor shall either obtain an endorsement to the aforesaid required insurance policy adding the State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, as additional parties insured thereunder or shall obtain a separate owner's protective liability insurance policy for such parties with coverage similar to that required by the first sentence of this subdivision. In addition, any Contractor or subcontractor engaged in the removal, handling, or wrapping of asbestos shall, to the fullest extent permitted by law, hold harmless and indemnify the State University Construction Fund, the Dormitory Authority of the State of New York, the State of New York and the State University of New York, their trustees, officers, agents or employees, for any claims or liabilities in connection with illness or sickness arising from work performed, not performed, or which should have been performed. The Contractor shall have said hold-harmless and indemnification conditions stipulated in all Contracts with subcontractors.

Section 5.07 Builder's Risk

- (1) The Contractor shall procure and maintain, at its own cost and expense, until final acceptance of all work covered by this Agreement or until the Project has been turned over for use by the State University of New York, whichever event occurs earlier, a builder's risk insurance policy covering all risks, with fire, extended coverage, vandalism and malicious mischief coverage. In the event the loss occurs at an occupied facility, the policy shall permit occupancy without the consent of the insurance company. The policy shall cover the cost of removing debris, including demolition as may be legally necessary by operation of any law, ordinance, or regulation, and property of the State held in their care, custody and/or control.
- (2) The policy shall be in an amount equal to the Project's insurable value, i.e., the Contract consideration less the cost of the Contractor's Performance and Labor and Material Bonds; the cost of trees, shrubbery, lawn grass, plants and the maintenance of the same; the cost of demolition; the cost of excavation; the cost of foundations, piers or other supports which are below the undersurface of the lowest basement floor, or where there is no basement, which are below the surface of the ground, concrete and masonry work; the cost of underground flues, pipes or wiring; the cost of earthmoving, grading and the cost of paving, roads, walks, parking lots or

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athletic fields; and the cost of bridges, tunnels, dams, piers, wharves, docks, retaining walls and radio and/or television towers and antennas.

- (3) The policy may contain a provision for a \$500 deductible for each loss to a Project having an insurable value of less than \$1,500,000 and a \$1,000 deductible for each loss to a Project having an insurable value of \$1,500,000 or more.
- (4) The University, the Contractor and its subcontractors, as their interests may appear, shall be named as the parties insured under said policy.
- (5) The Contractor shall have the sole responsibility to promptly report any loss to the insurer and/or its representatives and to furnish the latter with all necessary details relating to the occurrence of the loss and the amount thereof. The University, the Contractor and all subcontractors of the Contractor waive all rights, each against the others, for damages caused by fire or other perils covered by insurance provided under the terms of this Section, except such rights as they may have to the proceeds of insurance received; provided, however, this waiver shall not apply to any manufacturer, supplier or similar agent under any guarantee or warranty.
- (6) The Contractor shall not violate or permit to be violated any condition of such policy and shall at all times satisfy the fire safety requirements of the University and the insurance company issuing the same.
- (7) The procurement and maintenance of said policy shall in no way be construed or be deemed to relieve the Contractor from any of the obligations and risks imposed upon it by this Agreement or to be a limitation on the nature or extent of such obligations and risks.
- (8) Not less than thirty days prior to the expiration date or renewal date, the Contractor shall supply the University with an updated replacement certificate of insurance and endorsements. The Contractor shall advise the University of any letter or notification that cancels, materially changes, or non- renews the policy and Contractor shall require the insurance carrier(s) to copy the University on any letter or notification that cancels, materially changes, or non- renews the policy. Before the Contractor shall be entitled to have any progress payment rendered on account of the work which is to be insured pursuant to this Section, it shall furnish to the University a certificate in duplicate of the insurance herein required. Such insurance must be procured from an insurance carrier approved by the University, licensed to do business in the State of New York ("admitted" carrier), and rated at least "A-" by A.M. Best Company.

Section 5.08 Effect of Procurement of Insurance

Neither the procurement nor the maintenance of such insurance shall in any way affect or limit the obligations, responsibilities or liabilities of the Contractor hereunder.

Section 5.09 No Third Party Rights

Nothing in this Section or in this Agreement shall create or give to third parties, except the Dormitory Authority of the State of New York, the State of New York and the State University Construction Fund any claim or right of action against the Contractor, the Consultant, the State University of New York, the State University Construction Fund, the Dormitory Authority of the State of New York, or the State of New York and beyond such as may legally exist irrespective of this Section or this Agreement.

Article VI

Minority and Women's Business Enterprises (MWBEs) / Equal Employment Opportunity (EEO) Provisions

The University is required to implement the provisions of New York State Executive Law Article 15-A and 5 NYCRR Parts 142-145 ("MWBE Regulations") for all State contracts as defined therein, with a value (1) in excess of \$25,000 for labor, services, equipment, materials, or any combination of the foregoing or (2) in excess of \$100,000 for real property renovations and construction.

The requirements for the MWBE and EEO programs are set forth in "Exhibit A-1" which is attached hereto and made a part hereof, and shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and, in the event any such provision is not inserted or is not correctly inserted, then, upon the application of either party, this Agreement shall forthwith be physically amended to make such insertion or correction.

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Article VII
Provisions Required by Law

Section 7.01 Provisions Deemed Inserted

Each and every provision required by law to be inserted in the Contract, including, but not limited to, the applicable provisions set forth in Exhibit "A" which is attached hereto and made a part hereof, shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein and, in the event any such provision is not inserted or is not correctly inserted, then, upon the application of either party, this Agreement shall forthwith be physically amended to make such insertion or correction.

Section 7.02 Wage Rates

The Contractor shall post the appropriate prevailing wage schedules in a conspicuous place at the construction site. The Department of Labor shall provide the Contractor with posters relating to prevailing wage rates and same shall be displayed by the Contractor in a conspicuous place at the construction site. The Contractor shall also distribute wallet cards, to be provided by the Department of Labor, to all workers engaged at the construction site containing information relating to wage rates and telephone numbers to call if a worker believes his or her rights are being violated. The Contractor shall provide each worker with a written notice, informing them of the applicable prevailing wage requirements, and the Contractor must obtain a signed statement or declaration from such worker attesting to the fact that he or she has been given this information. Further, the Contractor is required to keep certified copies of its payrolls at the construction site.

Section 7.03 Governing Law

This Agreement shall be governed, construed and enforced in accordance with the laws of New York State, excluding New York State's choice of law principles, in a court of competent jurisdiction, and all claims relating to or arising out of this Agreement or the breach thereof, whether sounding in contract, tort or otherwise, shall likewise be governed by the laws of New York State, excluding the New York choice of law principles, in a court of competent jurisdiction. Consultant agrees to submit itself to such courts' jurisdiction.

Article VIII
Vendor Responsibility

- (1) The Contractor shall at all times during the Agreement term remain responsible. The Contractor shall provide the University with written notice as required by this Article of any issues impacting its responsibility, which shall minimally include updated responses to the it's filed vendor responsibility questionnaire. The Contractor agrees, if requested by the University, to present evidence of its continuing legal authority to do business in New York State, integrity, experience, ability, prior performance and organizational and financial capacity.
- (2) The University, at its sole discretion, reserves the right to suspend any or all activities under this Agreement, at any time, when the University discovers information that calls into question the responsibility of the Contractor. In the event of such suspension, the Contractor will be given written notice outlining the particulars of such suspension. Upon issuance of such notice, the Contractor must comply with the terms of the suspension order. Agreement activity may resume at such time as the University issues a written notice authorizing a resumption of performance under the Agreement.
- (3) Upon written notice to the Contractor, and a reasonable opportunity to be heard with appropriate University officials or staff, the Contractor may be terminated by the University at the Contractor's expense where the Contractor is determined by the University to be non-responsible. In such event, the University may complete the contractual requirements in any manner that the University may deem advisable and pursue available legal or equitable remedies for breach.

In no case shall termination of the Contract by the University be deemed a breach by the University thereof, nor shall the University be liable for any damages or lost profits or otherwise, which may be sustained by Contractor as a result of such termination.

State University of New York
Construction Agreement

Article IX

Use of Service-Disabled Veteran-Owned Business Enterprises in Contract Performance

Article 17-B of New York State Executive Law acknowledges that Service-Disabled Veteran-Owned Businesses (SDVOBs) strongly contribute to the economies of the State and the nation. As defenders of our nation and in recognition of their economic activity in doing business in New York State, the Contractor for the Project and Work defined in this Agreement, agrees to, at no additional cost to the University, fully comply and cooperate with the University's implementation of New York State Executive Law Article 17-B and provide opportunities for SDVOBs in the fulfillment of the requirements of this Agreement. SDVOBs can be readily identified on the directory of certified businesses at: http://www.ogs.ny.gov/Core/docs/CertifiedNYS_SDVOB.pdf.

State University of New York
Construction Agreement

In accordance with the Chapter 17 of the Laws of 2023 certain University contracts are subject to review by the Office of the State Comptroller. As such a contract, the State shall have no liability under this Agreement and this Agreement is not valid, effective, or binding until it has been approved by the Office of the State Comptroller and filed in their office.

This Agreement may be amended only upon the mutual written consent of the Parties, and with the approval of the New York Attorney General and the Office of the State Comptroller if such approval is required.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

Agency Certification:

In addition to the acceptance of this contract, I also certify that original copies of this signature page will be attached to all other exact copies of this contract.

Contract Number: *D990228*

Insert Contractor Name

STATE UNIVERSITY OF NEW YORK

Sign: _____ Date: _____

Sign: _____ Date: _____

Print: _____

Print: _____

Title: _____

Title: _____

APPROVED BY ATTORNEY GENERAL:

**APPROVED BY OFFICE OF THE STATE
COMPTROLLER:**

_____ Date: _____

_____ Date: _____

By:

By:

State University of New York
Construction Agreement

Schedule I, II, III

SCHEDULE I
Unit Prices

Refer to Section 4.04 of the Agreement for additional information.

<u>Work or Material</u> <u>Description</u> _____	<u>Amount in Words</u>	<u>Amount in Figures</u>
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None

SCHEDULE II Allowance(s)

Refer to Section 4.05 of the Agreement for additional information. The amount(s) indicated below shall be included in the Total Bid amount and their total indicated on the Proposal in the space provided.

<u>Work or Material</u> <u>Description</u> _____	<u>Amount in Words</u>	<u>Amount in Figures</u>
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None

SCHEDULE III Field Order Allowance

Refer to Section 4.05A of the Agreement for additional information. The amount indicated below shall be included in the Total Bid amount and indicated on the Proposal in the space provided

Thirty-three thousand and thirty-four dollars _____	\$33,034.00 _____
(in words)	(in figures)

The parties to the attached contract, license, lease, amendment or other agreement of any kind (hereinafter, "contract") agree to be bound by the following clauses which are hereby made a part of the contract (the word "Contractor" herein refers to any party other than the State or State University of New York, whether a Contractor, licensor, licensee, lessor, lessee or any other party; the State University of New York shall hereinafter be referred to as "SUNY"):

1. **EXECUTORY CLAUSE.** In accordance with Section 41 of the State Finance Law, the State shall have no liability under this contract to the Contractor or to anyone else beyond funds appropriated and available for this contract.

2. **PROHIBITION AGAINST ASSIGNMENT.** In accordance with Section 138 of the State Finance 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 State's previous written consent, and attempts to do so are null and void. Notwithstanding the foregoing, such prior written consent of an assignment of a contract let pursuant to Article XI of the State Finance Law may be waived at the discretion of SUNY and with the concurrence of the State Comptroller where the original contract was subject to the State Comptroller's approval, where the assignment is due to a reorganization, merger or consolidation of the Contractor's business entity or enterprise. SUNY retains its right to approve an assignment and to require that any Contractor demonstrate its responsibility to do business with SUNY. The Contractor may, however, assign its right to receive payments without SUNY's prior written consent unless this contract concerns Certificates of Participation pursuant to Article 5-A of the State Finance Law.

3. **COMPTROLLER'S APPROVAL.** (a) In accordance with Section 112 of the State Finance Law, the State Comptroller's approval is required for the following contracts: (i) goods, services, construction, and construction-related services for State University hospital or healthcare facilities which exceed \$150,000; (ii) purchases utilizing an Office of General Services (OGS) centralized contract which exceed \$200,000 (iii) goods, services, construction, and construction-related services not described in (i) or (ii) and which exceed \$75,000;

(b) If this contract exceeds the threshold amounts listed above in Paragraph 3(a), or, if this is an amendment for any amount to a contract which, as so amended, exceeds said threshold amounts, or if, by this contract, the State agrees to give something other than money when the value or reasonably estimated value of such consideration exceeds \$25,000, it shall not be valid, effective or binding upon the State, and the State shall bear no liability, until it has been approved by the State Comptroller and filed in his or her office.

4. **WORKERS' COMPENSATION BENEFITS.** In accordance with Section 142 of the State Finance 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.

5. **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, nor subject any individual to harassment, because of age, race, creed, color, national origin, citizenship or immigration status, sexual orientation, gender identity or expression, military status, sex, disability, predisposing genetic characteristics, familial status, marital status, or domestic violence victim status or because the individual has opposed any practices forbidden under the Human Rights Law or has filed a complaint, testified, or assisted in any proceeding under the Human Rights Law. 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, 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 thereof, 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. 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 moneys due hereunder for a second or subsequent violation

6. **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 thereof, neither 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 statutes, 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, 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 State of any State- approved sums due and owing for work done upon the project.

7. **NON-COLLUSIVE BIDDING CERTIFICATION.** In accordance with Section 139-d of the State Finance Law, if this contract was awarded based upon the submission of competitive bids, Contractor affirms, under penalty of perjury, that its bid was arrived at independently and without collusion aimed at restricting competition. Contractor further affirms that, at the time Contractor submitted its bid, an authorized and responsible person executed and delivered to SUNY a non-collusive bidding certification on Contractor's behalf.

8. **INTERNATIONAL BOYCOTT PROHIBITION.** In accordance with Section 220-f of the Labor Law and Section 139-h of the State Finance Law, if this contract exceeds \$5,000, the Contractor agrees, as a material condition of the contract, that neither the Contractor nor any substantially owned or affiliated person, firm, partnership or corporation has participated, is participating, or shall participate in an international boycott in violation of the federal Export Administration Act of 1979 (50 USC App. Sections 2401 *et seq.*) or regulations thereunder. If such Contractor, or any of the aforesaid affiliates of Contractor, is convicted or is otherwise found to have violated said laws or regulations upon the final determination of the United States Commerce Department or any other appropriate agency of the United States subsequent to the contract's execution, such contract, amendment or modification thereto shall be rendered forfeit and void. The Contractor shall so notify the State Comptroller within five (5) business days of such conviction, determination or disposition of appeal (2 NYCRR § 105.4).

9. **SET-OFF RIGHTS.** The State shall have all of its common law, equitable and statutory rights of set-off. These rights shall include, but not be limited to, the State's option to withhold for the purposes of set-off any moneys due to the Contractor under this contract up to any amounts due and owing to the State with regard to this contract, any other contract with any State department or agency, including any contract for a term commencing prior to the term of this contract, plus any amounts due and owing to the State for any other reason including, without limitation, tax delinquencies, fee delinquencies or monetary penalties relative thereto. The State shall exercise its set-off rights in accordance with normal State practices including, in cases of set-off pursuant to an audit, the finalization of such audit by SUNY, its representatives, or the State Comptroller.

10. **RECORDS.** The Contractor shall establish and maintain complete and accurate books, records, documents, accounts and other evidence directly pertinent to performance under this contract (hereinafter, collectively, "the Records"). 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 State Comptroller, the Attorney General and any other person or entity authorized to conduct an examination, as well as SUNY and any other agencies involved in this contract, shall have access to the Records during normal business hours at an office of the Contractor within the State of New York or, if no such office is available, at a mutually agreeable and reasonable venue within the State, for the term specified above for the purposes of inspection, auditing and copying. SUNY 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: (i) the Contractor shall timely inform an appropriate SUNY official, in writing, that said Records should not be disclosed; and (ii) said Records shall be sufficiently identified; and (iii) designation of said Records as exempt under the Statute is reasonable. Nothing contained herein shall diminish or in any way adversely affect, SUNY's or the State's right to discovery in any pending or future litigation.

11. **IDENTIFYING INFORMATION AND PRIVACY NOTIFICATION.**

(a) Identification Number(s). Every invoice or New York State Claim for Payment submitted to SUNY by a payee, for payment for the sale of goods or services or for transactions (e.g., leases, easements, licenses, etc.) related to real or personal property must include the payee's identification number. The number is 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. Failure to include such number or numbers may delay payment. Where the payee does not have such number or numbers, the payee, on its invoice or Claim for Payment, must give the reason or reasons why the payee does not have such number or numbers.

(b) Privacy Notification. (1) 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 SUNY or the State 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 tax liabilities and to generally identify persons affected by the taxes administered by the Commissioner of Taxation and Finance. The information will be used for tax administration purposes and for any other purpose authorized by law. (2) The personal information is requested by the purchasing unit of SUNY contracting to purchase the goods or services or lease the real or personal property covered by this contract or lease. The information is maintained in the Statewide Financial System by the Vendor Management Unit within the Bureau of State Expenditures, Office of the State Comptroller, 110 State Street, Albany, New York 12236.

12. **EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITIES AND WOMEN.**

In accordance with Section 312 of the Executive Law and 5 NYCRR Part 143, if this

contract is: (i) a written agreement or purchase order instrument, providing for a total expenditure in excess of \$25,000.00, whereby a contracting agency is committed to expend or does expend funds in return for labor, services, supplies, equipment, materials or any combination of the foregoing, to be performed for, or rendered or furnished to the contracting agency; or (ii) a written agreement in excess of \$100,000.00 whereby a contracting agency is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon; or (iii) a written agreement in excess of \$100,000.00 whereby the owner of a State assisted housing project is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon for such project, then the following shall apply and by signing this agreement the Contractor certifies and affirms that it is Contractor's equal employment opportunity policy that:

(a) The Contractor will not discriminate against employees or applicants for employment because of race, creed, color, national origin, sex, age, disability or marital status, shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its workforce on State contracts and will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination. Affirmative action shall mean recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation;

(b) at SUNY's request, Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein; and

(c) the Contractor shall state, in all solicitations or advertisements for employees, that, in the performance of the State contract, all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

Contractor will include the provisions of "a," "b," and "c" above, in every subcontract over \$25,000.00 for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon (the "Work") except where the Work is for the beneficial use of the Contractor. Section 312 does not apply to: (i) work, goods or services unrelated to this contract; or (ii) employment outside New York State. The State shall consider compliance by a contractor or sub-contractor with the requirements of any federal law concerning equal employment opportunity which effectuates the purpose of this clause. SUNY shall determine whether the imposition of the requirements of the provisions hereof duplicate or conflict with any such federal law and if such duplication or conflict exists, SUNY shall waive the applicability of Section 312 to the extent of such duplication or conflict. Contractor will comply with all duly promulgated and lawful rules and regulations of the Department of Economic Development's Division of Minority and Women's Business Development pertaining hereto.

13. 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 Exhibit A, the terms of this Exhibit A shall control.

14. GOVERNING LAW. This contract shall be governed by the laws of the State of New York except where the Federal supremacy clause requires otherwise.

15. LATE PAYMENT. Timeliness of payment and any interest to be paid to Contractor for late payment shall be governed by Article 11-A of the State Finance Law to the extent required by law.

16. NO ARBITRATION. Disputes involving this contract, including the breach or alleged breach thereof, may not be submitted to binding arbitration (except where statutorily authorized) but must, instead, be heard in a court of competent jurisdiction of the State of New York.

17. SERVICE OF PROCESS. In addition to the methods of service allowed by the State Civil Practice Law & Rules ("CPLR"), Contractor hereby consents to service of process upon it by registered or certified mail, return receipt requested. Service hereunder shall be complete upon Contractor's actual receipt of process or upon the State's receipt of the return thereof by the United States Postal Service as refused or undeliverable. Contractor must promptly notify the State, in writing, of each and every change of address to which service of process can be made. Service by the State to the last known address shall be sufficient. Contractor will have thirty (30) calendar days after service hereunder is complete in which to respond.

18. PROHIBITION ON PURCHASE OF TROPICAL HARDWOODS. The Contractor certifies and warrants that all wood products to be used under this contract award will be in accordance with, but not limited to, the specifications and provisions of State Finance Law §165 (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 responsibility of the contractor to establish to meet with the approval of the State.

In addition, when any portion of this contract involving the use of woods, whether 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 the approval of the State, otherwise, the bid may not be considered responsive. Under bidder certifications, proof of qualification for exemption will be the responsibility of the Contractor to meet with the approval of the State.

19. MACBRIDE FAIR EMPLOYMENT PRINCIPLES. In accordance with the MacBride Fair Employment Principles (Chapter 807 of the Laws of 1992), the Contractor hereby stipulates that the Contractor either (a) has no business operations in Northern Ireland, or (b) shall take lawful steps in good faith to conduct any business operations in Northern Ireland in accordance with the MacBride Fair Employment Principles (as described in Section 165 of the New York State Finance Law), and shall permit independent monitoring of compliance with such principles.

20. OMNIBUS PROCUREMENT ACT OF 1992.

It is the policy of New York State to maximize opportunities for the participation of New York State business enterprises, including minority and women-owned business enterprises as bidders, subcontractors and suppliers on its procurement contracts.

Information on the availability of New York State subcontractors and suppliers is available from:

NYS Department of Economic Development
Division for Small Business and Technology Development
625 Broadway
Albany, NY 12245
Telephone: 518-292-5100

A directory of certified minority and women-owned business enterprises is available from:

NYS Department of Economic Development
Division of Minority and Women's Business Development
633 Third Avenue 33rd Floor
New York, NY 10017
646-846-7364
email: mwbebbusinessdev@esd.ny.gov
<https://ny.newnycontracts.com/FrontEnd/searchcertifieddirectory.asp>

The Omnibus Procurement Act of 1992 (Chapter 844 of the Laws of 1992, codified in State Finance Law § 139-i and Public Authorities Law § 2879(3)(n)-(p)) requires that by signing this bid proposal or contract, as applicable, Contractors certify that whenever the total bid amount is greater than \$1 million:

(a) The Contractor has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and subcontractors, including certified minority and women-owned business enterprises, on this project, and has retained the documentation of these efforts to be provided upon request to SUNY;

(b) The Contractor has complied with the Federal Equal Employment Opportunity Act of 1972 (P.L. 92-261), as amended;

(c) The Contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Job Service Division of the New York State Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The Contractor agrees to document these efforts and to provide said documentation to the State upon request; and

(d) The Contractor acknowledges notice that the State may seek to obtain offset credits from foreign countries as a result of this contract and agrees to cooperate with the State in these efforts.

21. RECIPROCITY AND SANCTIONS PROVISIONS. Bidders are hereby notified that if their principal place of business is located in a country, nation, province, state or political subdivision that penalizes New York State vendors, and if the goods or services they offer will be substantially produced or performed outside New York State, the Omnibus Procurement Act of 1994 and 2000 amendments (Chapter 684 and Chapter 383, respectively, codified in State Finance Law § 165(6) and Public Authorities Law § 2879(5))

require that they be denied contracts which they would otherwise obtain.
NOTE: As of May 2023, the list of discriminatory jurisdictions subject to this provision includes the states of South Carolina, Alaska, West Virginia, Wyoming, Louisiana and Hawaii.

22. COMPLIANCE WITH BREACH NOTIFICATION AND DATA SECURITY LAWS. Contractor shall comply with the provisions of the New York State Information Security Breach and Notification Act (General Business Law § 899-aa, § 899-bb, and State Technology Law § 208).

23. COMPLIANCE WITH CONSULTANT DISCLOSURE LAW. If this is a contract for consulting services, defined for purposes of this requirement to include analysis, evaluation, research, training, data processing, computer programming, engineering, environmental health and mental health services, accounting, auditing, paralegal, legal or similar services, then in accordance with Section 163(4)(g) of the State Finance Law (as amended by Chapter 10 of the Laws of 2006), the Contractor shall timely, accurately and properly comply with the requirement to submit an annual employment report for the contract to SUNY, the Department of Civil Service and the State Comptroller.

24. PURCHASES OF APPAREL AND SPORTS EQUIPMENT. In accordance with State Finance Law Section 165(7), SUNY may determine that a bidder on a contract for the purchase of apparel or sports equipment is not a responsible bidder as defined in State Finance Law Section 163 based on (a) the labor standards applicable to the manufacture of the apparel or sports equipment, including employee compensation, working conditions, employee rights to form unions and the use of child labor; or (b) bidder's failure to provide information sufficient for SUNY to determine the labor conditions applicable to the manufacture of the apparel or sports equipment.

25. PROCUREMENT LOBBYING. To the extent this contract is a "procurement contract" as defined by State Finance Law §§ 139-j and 139-k, by signing this contract the Contractor certifies and affirms that all disclosures made in accordance with State Finance Law §§ 139-j and 139-k are complete, true and accurate. In the event such certification is found to be intentionally false or intentionally incomplete, the State may terminate the contract by providing written notification to the Contractor in accordance with the terms of the contract.

26. CERTIFICATION OF REGISTRATION TO COLLECT SALES AND COMPENSATING USE TAX BY CERTAIN STATE CONTRACTORS, AFFILIATES AND SUBCONTRACTORS. To the extent this contract is a contract as defined by Tax Law § 5-a, if the Contractor fails to make the certification required by Tax Law § 5-a or if

during the term of the contract, the Department of Taxation and Finance or SUNY discovers that the certification, made under penalty of perjury, is false, then such failure to file or false certification shall be a material breach of this contract and this contract may be terminated, by providing written notification to the Contractor in accordance with the terms of the contract, if SUNY determines that such action is in the best interests of the State.

27. IRAN DIVESTMENT ACT. By entering into this contract, Contractor certifies in accordance with State Finance Law §165-a that it is not on the "Entities Determined to be Non-Responsive Bidders/Offerers pursuant to the New York State Iran Divestment Act of 2012" ("Prohibited Entities List") posted at: <https://ogs.ny.gov/iran-divestment-act-2012>.

Contractor further certifies that it will not utilize on this contract any subcontractor that is identified on the Prohibited Entities List. Contractor agrees that should it seek to renew or extend this contract, it must provide the same certification at the time the contract is renewed or extended. Contractor also agrees that any proposed Assignee of this contract will be required to certify that it is not on the Prohibited Entities List before the contract assignment will be approved by the State.

During the term of the contract, should SUNY receive information that a person (as defined in State Finance Law §165-a) is in violation of the above-referenced certifications, SUNY will review such information and offer the person an opportunity to respond. If the person fails to demonstrate that it has ceased its engagement in the investment activity which is in violation of the Act within 90 days after the determination of such violation, then SUNY shall take such action as may be appropriate and provided for by law, rule, or contract, including, but not limited to, imposing sanctions, seeking compliance, recovering damages, or declaring the Contractor in default.

SUNY reserves the right to reject any bid, request for assignment, renewal or extension for an entity that appears on the Prohibited Entities List prior to the award, assignment, renewal or extension of a contract, and to pursue a responsibility review with respect to any entity that is awarded a contract and appears on the Prohibited Entities list after contract award.

28. ADMISSIBILITY OF REPRODUCTION OF CONTRACT. Notwithstanding the best evidence rule or any other legal principle or rule of evidence to the contrary, the Contractor acknowledges and agrees that it waives any and all objections to the admissibility into evidence at any court proceeding or to the use at any examination before trial of an electronic reproduction of this contract, in the form approved by the State Comptroller, if such approval was required, regardless of whether the original of said contract is in existence.

THE FOLLOWING PROVISIONS SHALL APPLY ONLY TO THOSE CONTRACTS TO WHICH A HOSPITAL OR OTHER HEALTH SERVICE FACILITY IS A PARTY

29. Notwithstanding any other provision in this contract, the hospital or other health service facility remains responsible for insuring that any service provided pursuant to this contract complies with all pertinent provisions of Federal, state and local statutes, rules and regulations. In the foregoing sentence, the word "service" shall be construed to refer to the health care service rendered by the hospital or other health service facility.

30. (a) In accordance with the 1980 Omnibus Reconciliation Act (Public Law 96-499), Contractor hereby agrees that until the expiration of four years after the furnishing of services under this agreement, Contractor shall make available upon written request to the Secretary of Health and Human Services, or upon request, to the Comptroller General of the United States or any of their duly authorized representatives, copies of this contract, books, documents and records of the Contractor that are necessary to certify the nature and extent of the costs hereunder.

(b) If Contractor carries out any of the duties of the contract hereunder, through a subcontract having a value or cost of \$10,000 or more over a twelve-month period, such subcontract shall contain a clause to the effect that, until the expiration of four years after the furnishing of such services pursuant to such subcontract, the subcontractor shall make available upon written request to the Secretary of Health and Human Services or upon request to the Comptroller General of the United States, or any of their duly authorized representatives, copies of the subcontract and books, documents and records of the subcontract that are necessary to verify the nature and extent of the costs of such subcontract.

(c) The provisions of this section shall apply only to such contracts as are within the definition established by the Health Care Financing Administration, as may be amended or modified from time to time.

31. Hospital Retained Authority: Hospital Retained Authority: The Hospital retains direct, independent authority over the appointment and/or dismissal, in its sole discretion, of the facility's management level employees (including but not limited to, the Facility/Service Administrator/Director, the Medical Director, the Director of Nursing, the Chief Executive Officer, the Chief Financial Officer and the Chief Operating Officer) and all licensed or certified health care staff. The Hospital retains the right to adopt and approve, at its sole discretion, the facility's operating and capital budgets. The Hospital retains independent control over and physical possession of the facility's books and records. The Hospital retains independent control over and physical possession of the facility's operating policies and procedures. The Hospital retains full authority and responsibility for, and control over, the operations and management of the facility. The Hospital retains the right and authority to independently adopt, approve and enforce, in its sole discretion, policies affecting the facility's delivery of health care services. The Hospital retains the right to independently adopt, approve and enforce, at its sole discretion, the disposition of assets and authority to incur debts. The Hospital retains the right to approve, at its sole discretion, contracts for administrative services, management and/or clinical services. The Hospital retains the right to approve, at its sole discretion, any facility debt. The Hospital retains the right to approve, at its sole discretion, settlements of administrative proceeding or litigation to which the facility is a party. No powers specifically reserved to the Hospital may be delegated to, or shared by, the Contractor or any other person. In addition, if there is any disagreement between the parties to this Agreement regarding control between the Hospital and the Contractor, the terms of this Section shall control.

1. DEFINITIONS. The following terms shall be defined in accordance with Section 310 of the Executive Law:

STATE CONTRACT herein referred to as "State Contract", shall mean: (a) a written agreement or purchase order instrument, providing for a total expenditure in excess of twenty-five thousand dollars (\$25,000.00), whereby the State University of New York ("University") is committed to expend or does expend funds in return for labor, services including but not limited to legal, financial and other professional services, supplies, equipment, materials or a combination of the foregoing, to be performed for, or rendered or furnished to the University; (b) a written agreement in excess of one hundred thousand dollars (\$100,000.00) whereby the University is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon; (c) and (d) a written agreement in excess of one hundred thousand dollars (\$100,000.00) whereby the University as an owner of a state assisted housing project is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon for such project.

SUBCONTRACT herein referred to as "Subcontract", shall mean any agreement for a total expenditure in excess of \$25,000 providing for services, including non-staffing expenditures, supplies or materials of any kind between a State agency and a prime contractor, in which a portion of the prime contractor's obligation under the State contract is undertaken

or assumed by a business enterprise not controlled by the prime contractor.

WOMEN-OWNED BUSINESS ENTERPRISE herein referred to as "WBE", shall mean a business enterprise, including a sole proprietorship, partnership or corporation that is: (a) at least fifty-one percent (51%) owned by one or more United States citizens or permanent resident aliens who are women; (b) an enterprise in which the ownership interest of such women is real, substantial and continuing; (c) an enterprise in which such women ownership has and exercises the authority to control independently the day-to-day business decisions of the enterprise; (d) an enterprise authorized to do business in this state and independently owned and operated; (e) an enterprise owned by an individual or individuals, whose ownership, control and operation are relied upon for certification, with a personal net worth that does not exceed fifteen million dollars (\$15,000,000), as adjusted annually on the first of January for inflation according to the consumer price index of the previous year; and (f) an enterprise that is a small business pursuant to subdivision twenty of this section.

A firm owned by a minority group member who is also a woman may be certified as a minority-owned business enterprise, a women-owned business enterprise, or both, and may be counted towards either a minority-owned business enterprise goal or a women-owned business enterprise goal, in regard to any Contract or any goal, set by an agency or authority, but such participation may not be counted towards both such goals. Such an enterprise's participation in a Contract may not be divided between the minority-owned

business enterprise goal and the women-owned business enterprise goal.

MINORITY-OWNED BUSINESS ENTERPRISE herein referred to as "MBE", shall mean a business enterprise, including a sole proprietorship, partnership or corporation that is: (a) at least fifty-one percent (51%) owned by one or more minority group members; (b) an enterprise in which such minority ownership is real, substantial and continuing; (c) an enterprise in which such minority ownership has and exercises the authority to control independently the day-to-day business decisions of the enterprise; (d) an enterprise authorized to do business in this state and independently owned and operated; (e) an enterprise owned by an individual or individuals, whose ownership, control and operation are relied upon for certification, with a personal net worth that does not exceed fifteen million dollars (\$15,000,000.00), as adjusted annually on the first of January for inflation according to the consumer price index of the previous year; and (f) an enterprise that is a small business pursuant to subdivision twenty of this section.

MINORITY GROUP MEMBER shall mean a United States citizen or permanent resident alien who is and can demonstrate membership in one of the following groups: (a) Black persons having origins in any of the Black African racial groups; (b) Hispanic persons of Mexican, Puerto Rican, Dominican, Cuban, Central or South American of either Indian or Hispanic origin, regardless of race; (c) Native American or Alaskan native persons having origins in any of the original peoples of North America. (d) Asian and Pacific Islander persons having origins in any of the Far East countries, South East

Asia, the Indian Subcontinent or Pacific Islands.

CERTIFIED ENTERPRISE OR BUSINESS shall mean a business verified as a minority or women-owned business enterprise pursuant to section 314 of the Executive Law. A business enterprise which has been approved by the New York Division of Minority & Women Business Development (“DMWBD”) for minority or women-owned enterprise status subsequent to verification that the business enterprise is owned, operated, and controlled by minority group members or women, and that also meets the financial requirements set forth in the regulations.

2. TERMS. The parties to the attached State Contract agree to be bound by the following provisions which are made a part hereof (the word "Contractor" herein refers to any party other than the University:

1(a) Contractor and its Subcontractors shall undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination. For these purposes, affirmative action shall apply in the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, or termination and rates of pay or other forms of compensation.

(b) Prior to the award of a State Contract, the Contractor shall submit an equal employment opportunity (EEO) policy statement to the University within the time frame established by the University.

(c) As part of the Contractor’s EEO policy statement, the Contractor, as a precondition to entering into a valid and binding State Contract, shall agree to the following in the performance of the State Contract: (i) The Contractor will not discriminate against any employee or applicant for

employment, will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination, and shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on State Contracts;(ii) The Contractor shall state in all solicitations or advertisements for employees that, in the performance of the State Contract, all qualified applicants will be afforded equal employment opportunities without discrimination;(iii) At the request of the University the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union, or representative will not discriminate, and that such union or representative will affirmatively cooperate in the implementation of the Contractor’s obligations herein.

(d) Form 108 - Staffing Plan To ensure compliance with this Section, the Contractor shall submit a staffing plan to document the composition of the proposed workforce to be utilized in the performance of the Contract by the specified categories listed, including ethnic background, gender, and Federal occupational categories. Contractors shall complete the Staffing plan form and submit it as part of their bid or proposal or within a reasonable time, but no later than the time of award of the contract.

(e) Form 112 - Workforce Employment Utilization Report (“Workforce Report”)

(i) Once a contract has been awarded and during the term of Contract, Contractor is responsible for updating and providing notice to SUNY of any changes to the previously submitted Staffing Plan. This information is to be submitted on a

quarterly basis during the term of the contract to report the actual workforce utilized in the performance of the contract by the specified categories listed including ethnic background, gender, and Federal occupational categories. The Workforce Report must be submitted to report this information.

(ii) Separate forms shall be completed by Contractor and any subcontractor performing work on the Contract.

(iii) In limited instances, Contractor may not be able to separate out the workforce utilized in the performance of the Contract from Contractor’s and/or subcontractor’s total workforce. When a separation can be made, Contractor shall submit the Workforce Report and indicate that the information provided related to the actual workforce utilized on the Contract. When the workforce to be utilized on the contract cannot be separated out from Contractor’s and/or subcontractor’s total workforce, Contractor shall submit the Workforce Report and indicate that the information provided is Contractor’s total workforce during the subject time frame, not limited to work specifically under the contract.

(f) Contractor shall comply with the provisions of the Human Rights Law, all other State and Federal statutory and constitutional non-discrimination provisions. Contractor and subcontractors shall not discriminate against any employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status, and shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest.

(g) The Contractor shall include the provisions of this section in every Subcontract in such a manner that the requirements of the provisions will be binding upon each Subcontractor as to work in connection with the State Contract, including the requirement that Subcontractors shall undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal employment opportunities without discrimination, and, when requested, provide to the Contractor information on the ethnic background, gender, and Federal occupational categories of the employees to be utilized on the State Contract.

(h) To ensure compliance with the requirements of this paragraph, the University shall inquire of a Contractor whether the work force to be utilized in the performance of the State Contract can be separated out from the Contractor's and/or Subcontractors' total work force and where the work of the State Contract is to be performed. For Contractors who are unable to separate the portion of their work force which will be utilized for the performance of this State Contract, Contractor shall provide reports describing its entire work force by the specified ethnic background, gender, and Federal Occupational Categories, or other appropriate categories which the agency may specify.

(i) The University may require the Contractor and any Subcontractor to submit compliance reports, pursuant to the regulations relating to their operations and implementation of their affirmative action or equal employment opportunity program in effect as of the date the State Contract is executed.

(j) If a Contractor or Subcontractor does not have an existing affirmative action program, the University may provide to the Contractor or Subcontractor a model plan of an affirmative action program. Upon request, the Director of

DMWBD shall provide a contracting agency with a model plan of an affirmative action program.

(k) Upon request, DMWBD shall provide the University with information on specific recruitment sources for minority group members and woman, and contracting agencies shall make such information available to Contractors

3. Contractor must provide the names, addresses and federal identification numbers of certified minority- and women-owned business enterprises which the Contractor intends to use to perform the State Contract and a description of the Contract scope of work which the Contractor intends to structure to increase the participation by Certified minority- and/or women-owned business enterprises on the State Contract, and the estimated or, if known, actual dollar amounts to be paid to and performance dates of each component of a State Contract which the Contractor intends to be performed by a certified minority- or woman-owned business enterprise. In the event the Contractor responding to University solicitation is joint venture, teaming agreement, or other similar arrangement that includes a minority- and women owned business enterprise, the Contractor must submit for review and approval: i. the name, address, telephone number and federal identification of each partner or party to the agreement; ii. the federal identification number of the joint venture or entity established to respond to the solicitation, if applicable; iii. A copy of the joint venture, teaming or other similar arrangement which describes the percentage of interest owned by each party to the agreement and the value added by each party; iv. A copy of the mentor-protégé agreement between the parties, if applicable, and if not described in the joint venture, teaming agreement, or other similar arrangement.

4. PARTICIPATION BY MINORITY GROUP MEMBERS AND WOMEN. The University shall determine whether Contractor has made conscientious and active efforts to employ and utilize minority group members and women to perform this State Contract based upon an analysis of the following factors:

(a) Whether Contractor established and maintained a current list of recruitment sources for minority group members and women, and whether Contractor provided written notification to such recruitment sources that contractor had employment opportunities at the time such opportunities became available.

(b) Whether Contractor sent letters to recruiting sources, labor unions, or authorized representatives of workers with which contractor has a collective bargaining or other agreement or understanding requesting assistance in locating minority group members and women for employment.

(c) Whether Contractor disseminated its EEO policy by including it in any advertising in the news media, and in particular, in minority and women news media.

(d) Whether Contractor has attempted to provide information concerning its EEO policy to Subcontractors with which it does business or had anticipated doing business.

(e) Whether internal procedures exist for, at a minimum, annual dissemination of the EEO policy to employees, specifically to employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions. Such dissemination may occur through distribution of employee policy manuals and handbooks, annual reports, staff meetings and public postings.

(f) Whether Contractor encourages and utilizes minority group members and women

employees to assist in recruiting other employees.

(g) Whether Contractor has apprentice training programs approved by the N.Y.S. Department of Labor which provides for training and hiring of minority group members and women.

(h) Whether the terms of this section have been incorporated into each Subcontract which is entered into by the Contractor.

5. PARTICIPATION BY MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISES. Based upon an analysis of the following factors, the University shall determine whether Contractor has made good faith efforts to provide for meaningful participation by minority-owned and women-owned business enterprises which have been certified by DMWBD:

(a) Whether Contractor has actively solicited bids for Subcontracts from qualified M/WBEs, including those firms listed on the Directory of Certified Minority and Women-Owned Business Enterprises, and has documented its good faith efforts towards meeting minority and women owned business enterprise utilization plans by providing, copies of solicitations, copies of any advertisements for participation by certified minority- and women-owned business enterprises timely published in appropriate general circulation, trade and minority- or women-oriented publications, together with the listing(s) and date(s) of the publications of such advertisements; dates of attendance at any pre-bid, pre-award, or other meetings, if any, scheduled by the University, with certified minority- and women-owned business enterprises, and the reasons why any such firm was not selected to participate on the project.

(b) Whether Contractor has attempted to make project plans and specifications available to firms who are not members of associations with

plan rooms and reduce fees for firms who are disadvantaged.

(c) Whether Contractor has utilized the services of organizations which provide technical assistance in connection with M/WBE participation.

(d) Whether Contractor has structured its Subcontracts so that opportunities exist to complete smaller portions of work.

(e) Whether Contractor has encouraged the formation of joint ventures, partnerships, or other similar arrangements among Subcontractors.

(f) Whether Contractor has requested the services of the Department of Economic Development (DED) to assist Subcontractors' efforts to satisfy bonding requirement.

(g) Whether Contractor has made progress payments promptly to its Subcontractors.

(h) Whether the terms of this section have been incorporated into each Subcontract which is entered into by the Contractor. It shall be the responsibility of Contractor to ensure compliance by every Subcontractor with these provisions.

6. MWBE Utilization Plan.

(a) The Contractor represents and warrants that Contractor has submitted an MWBE Utilization Plan prior to the execution of the contract.

(b) MWBE Utilization Plan (Form 7557-107).

Contractors are required to submit a Utilization Plan on Form 7557-107 with their bid or proposal. Complete the following steps to prepare the Utilization Plan:

- i. list NYS Certified minority- and women-owned business enterprises which the Contractor intends to use to perform the State contract;
- ii. insert a description of the contract scope of work which the Contractor intends to structure to increase the

participation by NYS Certified minority- and women-owned enterprises on the State contract;

- iii. insert the estimated or, if known, actual dollar amounts to be paid to and performance dates of each component of a State contract which the Contractor intends to be performed by a NYS Certified minority- or women-owned business; and

(c) Any modifications or changes to the agreed participation by NYS Certified MWBEs after the Contract Award and during the term of the contract must be reported on a revised MWBE Utilization Plan and submitted to the SUNY University-wide MWBE Program Office.

(d) The University will review the MWBE Utilization Plan and will issue the Contractor a written notice of acceptance or deficiency within twenty (20) day of its receipt. A notice of deficiency shall include the:

- i. list NYS Certified minority- and women-owned business enterprises which the Contractor intends to use to perform the State contract;
- ii. name of any MWBE which is not acceptable for the purpose of complying with the MWBE participation goals;
- iii. reasons why it is not an acceptable element of the Contract scope of work which the MWBE Program Office has determined can be reasonably structured by the Contractor to increase the likelihood of participation in the Contract by MWBEs; and
- iv. other information which the MWBE Program Office determines to be relevant to the MWBE Utilization Plan.

(e) The Contractor shall respond to the notice of deficiency within seven (7) business days of receipt by submitting to the University a written remedy in response to the notice of deficiency.

i. If the written remedy that is submitted is not timely or is found to be inadequate, the University-wide MWBE Program Office shall notify the Contractor and direct the Contractor to submit, within five (5) business days, a request for partial or total waiver of MWBE participation goals on forms provided by the University-wide MWBE Program Office.

ii. Failure to file the waiver form in a timely manner may be grounds for disqualification of the bid or proposal.

(f) The University may disqualify a Contractor as being non-responsive under the following circumstances:

i. If a Contractor fails to submit a MWBE Utilization Plan;

ii. If a Contractor fails to submit a written remedy to a notice of deficiency in a MWBE Utilization Plan;

iii. If a Contractor fails to submit a request for waiver; or

iv. If the MWBE Program Office determines that the Contractor has failed to document Good Faith Efforts.

(g) Contractor agrees to use such MWBE Utilization Plan for the performance of MWBEs on the Contract pursuant to the prescribed MWBE goals set forth in Section III-A of this Appendix.

(h) Contractor further agrees that a failure to submit and/or use such MWBE Utilization Plan shall constitute a material breach of the terms of the Contract. Upon the

occurrence of such a material breach, SUNY shall be entitled to any remedy provided herein, including but not limited to, a finding of Contractor non-responsiveness.

7. Waivers.

(a) For Waiver Requests Contractor should use (Form 7557-114) – Waiver Request.

(b) If the Contractor, after making good faith efforts, is unable to comply with MWBE goals, the Contractor may submit a Request for Waiver form documenting good faith efforts by the Contractor to meet such goals. If the documentation included with the waiver request is complete the University shall evaluate the request and issue a written notice of acceptance or denial within twenty (20) days of receipt.

(c) If University, upon review of the MWBE Utilization Plan and updated Quarterly MWBE Contractor Compliance Reports determines that Contractor is failing or refusing to comply with the Contract goals and no waiver has been issued in regards to such non-compliance, the University may issue a notice of deficiency to the Contractor. The contractor must respond to the notice of deficiency within seven (7) business days of receipt. Such response may include a request for partial or total waiver of MWBE Contract Goals.

8. MWBE Contractor Compliance Report.

Contractor is required to submit an MWBE Contractor Compliance Report (Form 7557-112) to the University by the 5th day following each end of quarter over the term of the Contract documenting the progress made towards achievement of the MWBE goals of the Contract. Compliance Reports for construction contracts (Form 7557-110) must be submitted on a monthly basis.

9. GOALS. (a) GOALS FOR MINORITY AND WOMEN WORK FORCE PARTICIPATION.

(i) The University shall include relevant work force availability data, which is provided by the DMWBD, in all documents which solicit bids for State Contracts and shall make efforts to assist Contractors in utilizing such data to determine expected levels of participation for minority group members and women on State Contracts.

(ii) Contractor shall exert good faith efforts to achieve such goals for minority and women's participation. To successfully achieve such goals, the employment of minority group members and women by Contractor must be substantially uniform during the entire term of this State Contract. In addition, Contractor should not participate in the transfer of employees from one employer or project to another for the sole purpose of achieving goals for minority and women's participation.

(b) GOALS FOR MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISES PARTICIPATION.

For all State Contracts in excess of \$25,000.00 whereby the University is committed to expend or does expend funds in return for labor, services including but not limited to legal, financial and other professional services, supplies, equipment, materials or a combination of the foregoing or all State Contracts in excess of \$100,000.00 whereby the University is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon, Contractor shall exert good faith efforts to achieve a participation goal of (9.69%) for Certified Minority-Owned Business Enterprises and (5.47%) for Certified Women-Owned Business

Enterprises.

10. ENFORCEMENT. The University will be responsible for enforcement of each Contractor's compliance with these provisions. Contractor, and each Subcontractor, shall permit the University access to its books, records and accounts for the purpose of investigating and determining whether Contractor or Subcontractor is in compliance with the requirements of Article 15-A of the Executive Law. If the University determines that a Contractor or Subcontractor may not be in compliance with these provisions, the University may make every reasonable effort to resolve the issue and assist the Contractor or Subcontractor in its efforts to comply with these provisions. If the University is unable to resolve the issue of noncompliance, the University may file a complaint with the DMWBD.

Failure to comply with all of the requirements herein may result in a

finding of non-responsiveness, non-responsibility and/or a breach of contract, leading to the withholding of funds or such other actions, remedies or enforcement proceedings as allowed by the Contract.

11. DAMAGES FOR NON COMPLIANCE.

Where the University determines that Contractor is not in compliance with the requirements of the Contract and Contractor refuses to comply with such requirements, or if Contractor is found to have willfully and intentionally failed to comply with the MWBE participation goals, Contractor shall be obligated to pay liquidated damages to the University. Such liquidated damages shall be calculated as an amount equaling the difference between:

a. All sums identified for payment to MWBEs had the Contractor achieved the contractual MWBE goals; and

b. All sums actually paid to MWBEs for work performed or materials supplied under the Contract.

In the event a determination has been made which requires the payment of liquidated damages and such identified sums have not been withheld by the University, Contractor shall pay such liquidated damages to the University within sixty (60) days after such damages are assessed, unless prior to the expiration of such sixtieth day, the Contractor has filed a complaint with the Director of the Division of Minority and Woman Business Development pursuant to Subdivision 8 of Section 313 of the Executive Law in which event the liquidated damages shall be payable if Director renders a decision in favor of the University.