SPECIFICATIONS FOR THE
ECONOMIC DEVELOPMENT CENTER
AND
ROWAN MEDICINE

at

Rowan College at Gloucester County
1400 Tanyard Road
Sewell, New Jersey 08080

for

Rowan College at Gloucester County
1400 Tanyard Road
Sewell, New Jersey 08080

Architect:
Garrison Architects
713 Creek Road
Bellmawr, New Jersey 08031
(856) 396-6200
Fax (856) 396-6205

Construction Manager:
GREYHAWK
2000 Midlantic Drive Suite 210
Mount Laurel, New Jersey 08054
(856) 722-1800
Fax: (856) 722-1806

Site Engineer:
Federici & Akin, PA
Consulting Engineers
307 Greentree Road
Sewell, NJ 08080
856-589-1400
Fax (856) 582-7976

Mechanical, Electrical & Plumbing Engineer:
Mulhern Consulting Engineers
321 South York Road
Hatboro, PA 19040
(215) 293-9900
Fax (215) 441-5984

Structural Engineer:
Orndorf and Associates
8600 West Chester Pike Suite 201
Upper Darby, PA 19083
(610) 896-4500
Fax: (610) 896-4503

DATE: April 15, 2019 “ISSUED FOR BID”
GA #17-108
BOOK 1 OF 2
# INDEX TO THE SPECIFICATIONS
## BOOK 1 of 2

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BIDDER’S CHECKLIST

FAILURE TO PROVIDE THE FOLLOWING INFORMATION AND DOCUMENTATION IDENTIFIED IN THIS BIDDER’S CHECKLIST AT THE TIME OF BID MAY BE CAUSE FOR REJECTION

Initial to Reflect Compliance:

_____ Bidder’s Checklist (Include with your Bid Package)
_____ BID FORM – PART A
_____ BID FORM – PART B - ALTERNATES

Subcontractor List: For Each Prime Subcontractor Listed on this Form, include the following:

A valid and active DPMC Notice of Classification, a Total Amount of Uncompleted Contracts Affidavit (form DPMC 701), No Material Adverse Change of Circumstances Form, Business Registration Certificate, Public Works Contractor Registration Certificate.

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Acknowledgment of Receipt of Addenda / Clarifications. If no Addenda / Clarifications are issued, then check the Box on the Form

_____ Hold Harmless Agreement

_____ Certification Regarding the Debarment, Suspension, Ineligibility and Voluntary Exclusion (Contractor and Subcontractor)

_____ Approved Apprenticeship Form

_____ Affirmative Action Requirements

_____ Prevailing Wage Rate Requirements

_____ Non-Collusion Affidavit

_____ New Jersey State Form Notice of Classification

_____ New Jersey State Form Uncompleted Contracts

_____ No Material Change of Circumstances
BIDDER’S CHECKLIST

_____ Statement of Ownership
_____ Disclosure of Claims or Suits (pursuant to Instruction to Bidders ¶21)
_____ Disclosure of Investment Activities in Iran
_____ Bid Bond
_____ Consent of Surety
_____ Disclosure of Contributions to New Jersey Election Law Enforcement Commission Form
_____ Letter of Assent
_____ Public Works Contractor Registration Certificate
_____ Business Registration Certificate (due prior to contract award for Contractor and all Prime Subcontractors)

By signing below, bidder acknowledges that he/she has read the AMERICANS WITH DISABILITIES ACT OF 1990 which has been included in the Specifications in the Instructions to Bidders.

I acknowledge that the above information is included with my Bid Package.

Acknowledged for: __________________________
(Name of Bidder)

By: __________________________
(Signature of Authorized Representative)

Name: __________________________

Title: __________________________

END OF SECTION
ROWAN COLLEGE AT GLOUCESTER COUNTY
ECONOMIC DEVELOPMENT CENTER AND ROWAN MEDICINE

NOTICE IS HEREBY GIVEN THAT sealed bids will be received by Rowan College at Gloucester County, 1400 Tanyard Road, Sewell, New Jersey on Wednesday, May 22, 2019 at 2:00 P.M. for the Economic Development Center and Rowan Medicine at Rowan College at Gloucester County, 1400 Tanyard Road, Sewell, NJ 08080 together with all work incidental thereto, in accordance with the requirements of the drawings and specifications prepared by Garrison Architects, 713 Creek Road, Bellmawr, New Jersey 08031.

The Work of the Project will be completed in a single lump sum contract.

Drawings, Specifications and other documents constituting the Contract Documents may be examined without charge at the office of Garrison Architects, 713 Creek Road, Bellmawr, New Jersey 08031 (856) 396-6200 ext. 0 between the hours of 9:00 A.M. and 4:00 P.M. The Contract Documents may be purchased at the above office for the NON-REFUNDABLE FEE of $300.00 (Three Hundred Dollars) made payable to Garrison Architects. If Shipping of Bid Documents is required bidders may provide their direct shipping account number to Garrison Architects.

Bidding shall be in conformance with the applicable requirements of the County College Contracts Law, N.J.S.A. 18A:64A-25.1 et seq.

Bids must be in duplicate (1 original and 1 copy) on the proposal forms provided and in the manner designated, enclosed in a sealed envelope bearing the name and address of the bidder and proposal identification on outside, and must be accompanied by a Certified Check, Cashier’s Check, or Bid Bond drawn to the order of Rowan College at Gloucester County in the amount not less than 10% of the Bid pursuant to N.J.S.A. 18A:64A-25.16 and must be delivered to the above place on or before the hour named. Rowan College at Gloucester County assumes no responsibility for bids mailed or misdirected in delivery.

Prospective bidders are advised that this Project is one which will be subject to and governed by provisions of New Jersey State Law governing (a) Prevailing Wage Act N.J.S.A. 34:11-56.27 et seq., and (b) Ownership Disclosure Certification P.L. 2016, Chapter 43, (N.J.S.A. 52:25-24.2).

Prospective bidders are advised that the Project is subject to a Project Labor Agreement (PLA). The PLA will be binding upon all contractors and subcontractors performing on-site Project work, as defined in Article 3 of the PLA.

The Public Works Contractor Registration Act N.J.S.A. 34:11-56.48 et seq. requires that the Contractor and Subcontractors must be registered at the time of Bid. The Owner is requesting that copies of the Certificates be included in the Contractor’s Bid Package. Pursuant to N.J.S.A. 52:32-44 all business organizations that do business with a local contracting agency are required to be registered with the State and provide proof of their Registration with the New Jersey Department of Treasury, Division of Revenue before the contracting agency may enter into a contract with the business.

In addition, and pursuant to N.J.S.A. 18A:64A-25.17, each bid must be accompanied by a Certificate from a Surety Company stating it will provide each bidder with separate Performance and Payment Bonds, each in the amount of 100% of the contract sum.

No bid may be withdrawn for a period of sixty (60) days after the dates set for the opening thereof. The right is reserved to reject all bids or to waive minor informalities or non-material exceptions.
Bidders are required to comply with the requirements of N.J.S.A. 10:5-31 et. seq. and N.J.A.C. 17:27 et. seq.

The bidder must be pre-qualified as C008 – General Construction by the New Jersey Department of Treasury, Division of Property Management and Construction, prior to the date that bids are received. The Prime Subcontractors listed must be pre-qualified by the New Jersey Department of Treasury, Division of Property Management and Construction, prior to the date that bids are received. The required categories are: C032 – HVACR, C030 – Plumbing, C047 – Electrical and C029 – Structural Steel and Ornamental Iron.

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<td>Bids Due at 2:00 P.M. at the Rowan College at Gloucester County, Eugene J. McCaffrey College Center Building, Faculty Staff Lounge, 1400 Tanyard Road, Sewell, New Jersey 08080</td>
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ROWAN COLLEGE AT GLOUCESTER COUNTY
BOARD OF TRUSTEES

April 15, 2019
INSTRUCTIONS TO BIDDERS

(The following instructions shall be adhered to in the preparation of this Bid by the Bidder.)

1. DEFINITIONS

   a. Owner: The term "Owner" as used in the Contract Documents refers to Rowan College at Gloucester County, 1400 Tanyard Road, Sewell, NJ 08080.

   b. Architect: The term "Architect" refers to Garrison Architects, 713 Creek Road, Bellmawr, New Jersey 08031, Telephone (856) 396-6200, Fax (856) 396-6205.

   c. Contractor: The term "Contractor" refers to the Contractor to whom an award is made to perform the work under Contracts enumerated in the Advertisement.


2. PREPARATION OF BIDS

   a. Bids shall be submitted on Form of Bid, hereto attached, or on an exact copy thereof which contains identical language. All blank spaces of the form shall be fully completed in accordance with these instructions, without variation, and there shall be no interlineations, deletions or additions. Base Bid Sum shall be stated both in writing and in figures; and, in case of discrepancy, written words shall be considered as being Bid Price.

   Submit bid in duplicate (1 original and 1 copy).

   b. Bid shall not contain recapitulations of the work to be done. No oral, telegraphic or telephonic communications or modifications shall be considered.

   c. Bids shall be addressed to the Owner whose name appears in Paragraph 1a; it shall be mailed or delivered to the address stated in the Advertisement, enclosed in an opaque sealed envelope, marked with the name of the Project and Bidders names; and must be received on or before the time designated in the Advertisement. No responsibility will be attached to Architect or Owner for premature opening of a bid which is not properly identified. Rowan College at Gloucester County assumes no responsibility for bids mailed or misdirected in delivery.

3. DISCREPANCIES OR OMISSIONS: BIDDER'S RESPONSIBILITY

   a. Bidders who find discrepancies in or omissions from the Contract Documents or are in doubt as to their meaning should at once notify the Architect in writing no later than 5:00 P.M. on the date set forth in the Advertisement. If it is deemed necessary, instructions in the form of Addenda / Clarifications to Specifications and / or Drawings will be issued to all Bidders by fax on the date set forth in the Advertisement and/or Section 01010 – Summary of Work. Owner or Architect will not be responsible for any oral instructions. It will be assumed with the submission of the proposal that the Bidder has fully examined the site, the Drawings and the Specifications, and has made provisions for construction under the conditions as set forth and is responsible for seeing that his proposed Subcontractors are familiar with requirements of Contract Documents so far as applicable to their work.
INSTRUCTIONS TO BIDDERS

b. Proposals shall be based upon Drawings, Specifications and other documents constituting the Contract Documents referred to in the Advertisement, bound herewith, including related Addenda issued by Garrison Architects and may not be withdrawn for a period of 60 days after date set for receiving bids. Any proposal which has been opened by the Owner may not be withdrawn during the period specified in the Advertisement, bound herewith, as the period during which proposals may not be withdrawn by Bidders, except as specifically permitted by law.

4. BID SECURITY: FORFEITURE

a. Bids shall be accompanied by a certified check, cashier’s check or BID BOND IN THE FORM PROVIDED IN THE CONTRACT DOCUMENTS, with corporate surety satisfactory to the Owner, in an amount of 10% of the Base Bid, to be retained and applied as provided, in case the Bidder should default in executing the Agreement and furnishing the required insurance certificates within ten (10) days after notice that an award has been made to him or in case the Bidder should default in furnishing the required Performance and Payment Bond as required by the Contract Documents.

b. Bid securities of the three lowest responsible Bidders for each Contract will be retained until Contract Documents have been properly executed by Bidder to whom Contract is awarded but in no event exceeding 60 days after bid opening. In the event that a Bid Bond is submitted with the Bid, the Bidder shall make certain that a proper power of attorney evidencing the authority of the agent of the surety to execute the Bid Bond is furnished therewith.

In addition, and pursuant to 18A:64A-25.17, each bid shall be accompanied by a Consent of Surety assuring that satisfactory arrangements have been made between the Surety and the Bidder, by which the Surety agrees to furnish the Bidder with a Performance Bond, a Payment Bond, and a Maintenance Bond, substantially in accordance with the forms attached hereto, each in the stated amount of one hundred percent of the Contract amount. The Consent of Surety shall be executed by an approved Surety Company authorized to do business in the State of New Jersey. The Surety’s consent and guarantee to issue the Performance and Payment Bonds must be unconditional. Submission of a Consent of Surety which contains any prior conditions upon the Surety’s issuance of the required Bonds shall be cause for rejection of the Bid.

c. If a Bidder to whom five (5) days’ notice of intention to accept his Bid has been made by or in behalf of the Owner fails to furnish a Performance and Payment Bond in form furnished herewith, as required by the law of the State where the work is to be performed, to the Owner, as a condition precedent to formal award of the Contract, or fails to execute the Agreement or to furnish the required insurance certificates, or fails to furnish the required form in compliance with N.J.S.A. 10:5-31, et seq. within ten (10) days after notice that an award has been made to him, the Owner may, at his sole discretion, award the Contract to the next lowest responsible Bidder or readvertise for bids, and the defaulting Bidder shall pay to the Owner the difference between the amount of his bid and any higher amount for which the Owner may contract for the required work, plus any advertising, Architect’s, legal or other expenses incurred by reason of the default.
INSTRUCTIONS TO BIDDERS

The security check of such defaulting Bidder or, as the case may be, the amount recovered from the surety of such Bidder on his Bid Bond shall be applied on account of such damages; and, if the amount of said difference, plus such expense, shall exceed the amount of such check or recovery, the defaulting bidder shall pay to the Owner the full amount of the excess.

5. CONTRACT BONDS

Performance, Payment and Maintenance Bonds need not be submitted with the Bidder's Bid. Performance and Payment Bonds shall be in compliance with requirements of New Jersey State Law and substantially in accordance with the form of bonds attached and submitted and approved after the award of bid and prior to Owner's execution of the Contract. A Maintenance Bond shall be submitted and approved after final completion and prior to final payment. Upon acceptance by the Owner of the Maintenance Bond and final payment, Contractor's Performance Bond will be released.

6. AWARD OF CONTRACT

a. Bidder responsibility including ability to complete the Project within the time specified, will be considered in making award. The Owner reserves the right to reject all bids and to waive minor informalities or non-material exceptions in the bid. Bids may be rejected if they show any omissions, alterations of form, additions or deductions not called for, conditional or uninvited alternate bids, or irregularities of any kind. Bids in which the prices are unbalanced may be rejected. Claims on account of mistakes in or omissions in bids will not be considered, except as specifically permitted by law.

b. If awards are made, the Owner will execute the Agreement within twenty-one (21) days after the Contractor executes and delivers same to Owner, accompanied by insurance certificates.

c. The award of Contract or rejection of bids will be made within sixty (60) days of the Bid Opening. The Owner can extend this period if both parties agree to such an extension.

d. Copies of the Performance and Payment Bond forms included with these Specifications exemplify type of Contract forms that the successful Bidder will be required to execute before or after award has been made, as contemplated by Contract Documents and as required by State law in case of such Bonds.

e. The Contract is subject to the appropriation of funds per N.J.A.C. 6A:23A-21.1(f).

7. CHANGES PRIOR TO OPENING OF BIDS

a. During the period allowed for the preparation of bids, the Architect may furnish the prospective Bidders Addenda / Clarifications setting forth additions to or alterations of the Contract Documents, which additions or alterations shall be included by each Bidder in the computation of amounts to be inserted by him in the proposal which he submits, and which Addenda / Clarifications shall become a part of such Contract Documents as if the same were fully incorporated herein.

b. It shall be the duty of each prospective Bidder to ascertain what Addenda / Clarifications, if any, have been issued by the Architect, which may affect the work to be covered by his proposal, and to inform his prospective Subcontractors thereof to the extent that they may be affected.
INSTRUCTIONS TO BIDDERS

c. Any Addenda / Clarification issued by the Architect will be sent by certified fax to each prospective Bidder of whom the Architect shall have a record.

8. START OF WORK

Shop Drawings, Submittals, etc. can be commenced after Notice to Proceed has been given by Owner or Architect.

9. COMPLETION OF THE PROJECT

The project must be completed by the date set forth in Advertisement and or Section 01010, “Summary of Work”.

10. BONDS AND INSURANCE

Requirements for Bonds and Insurance are stated in these Instructions to Bidders, Specifications and the AIA Document A201 – 2017 General Conditions of Contract for Construction. Separate Performance, Payment and Maintenance Bonds are required in the amount of 100% of Contract price for each Bond.

11. STATEMENT OF BIDDER'S QUALIFICATIONS

Each Bidder must submit with their bid the following documents from the State of New Jersey’s Department of the Treasury, Division of Property Management and Construction: (1) a Notice OF CLASSIFICATION indicating that they are qualified to bid on the public work as specified herein and (2) a TOTAL AMOUNT OF UNCOMPLETED CONTRACTS Affidavit included herein duly signed and notarized.

All bidders will also be required to supply an affidavit of no material adverse change in qualification information since the latest statement.

12. NEW JERSEY PREVAILING WAGE RATE / PUBLIC WORKS CONTRACTOR REGISTRATION

Bidders are required to comply with the State Prevailing Wage Rate for Public Works, N.J.S.A. 34:11-56.25 et seq., as amended.

Contractor shall ensure that all workers employed in the performance of this Contract shall be paid not less than the Prevailing Wage Rate designated for this locality by the Commission of Labor and Workforce Development. If it is found that any worker employed by the Contractor or any Subcontractor has been paid less than the Prevailing Wage Rate, the Owner may terminate the Contract.

The Contractors can reference the State of New Jersey Department of Labor and Workforce Development Website https://www.nj.gov/labor/wagehour/wagerate/CurrentWageRates.html to view current Prevailing Wage Rates. The official wage rates are ordered upon award of the contract.
INSTRUCTIONS TO BIDDERS

Owner reserves right to seek indemnification and/or damages from Contractor and/or its subcontractors for its failure to comply and/or violations of New Jersey Labor Laws.

The Public Works Contractor Registration Act, N.J.S.A. 34:11-56.48 et seq. (the Act) requires that Contractors (and Subcontractors) must be registered pursuant to the Act prior to submitting a bid. The Bidder should provide a copy of its Public Works Contractor Registration Certificate at the time of submission of the bid proposal. The Contractor shall enter into subcontracts only with subcontractors who are registered pursuant to the Act. After the bid is made and prior to awarding of the contract, the Bidder shall submit the certificates of registration of all subcontractors listed in the bid proposal.

13. BUSINESS REGISTRATION AND USE TAX

The Contractor shall comply with the business registration and use tax requirements of N.J.S.A. 52:32-44, which requires submission of the business registration certificate prior to contract award. The Owner is requesting that all Contractors (and Subcontractors) provide a copy of the business registration certification, issued by the Department of the Treasury, at the time of submission of their bid proposals to the Owner.

In accordance with N.J.S.A. 54:49-4.1: "A business organization that fails to provide a copy of a business registration as required pursuant to section 1 of P.L.2001, c.134 (C.52:32-44 et al.) or subsection e. or f. of section 92 of P.L.1977, c.110 (C.5:12-92), or that provides false information of business registration under the requirements of either of those sections, shall be liable for a penalty of $25 for each day of violation, not to exceed $50,000 for each business registration copy not properly provided under a contract with a contracting agency or under a casino service industry enterprise contract. L.2004, c.57, s.5; amended 2009, c.56, s.32."

14. NON-COLLUSION AFFIDAVIT

The Bidder shall submit with its bid the Non-Collusion Affidavit included in the Specifications.

15. OWNERSHIP DISCLOSURE CERTIFICATION N.J.S.A. 52:25-24.2

"No corporation, partnership, or limited liability company shall be awarded any contract nor shall any agreement be entered into for the performance of any work or the furnishing of any materials or supplies, unless prior to the receipt of the bid or proposal, or accompanying the bid or proposal of said corporation, said partnership, or said limited liability company there is submitted a statement setting forth the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be.

If one or more such stockholder or partner or member is itself a corporation or partnership or limited liability company, the stockholders holding 10 percent or more of that corporation's stock, or the individual partners owning 10 percent or greater interest in that partnership, or the members owning 10 percent or greater interest in that limited liability company, as the case may be, shall also be listed. The disclosure shall be continued until names and addresses of every non-corporate stockholder, and individual partner, and member, exceeding the 10 percent ownership criteria established in this act, has been listed.
INSTRUCTIONS TO BIDDERS

To comply with this section, a bidder with any direct or indirect parent entity which is publicly traded may submit the name and address of each publicly traded entity and the name and address of each person that holds a 10 percent or greater beneficial interest in the publicly traded entity as of the last annual filing with the federal Securities and Exchange Commission or the foreign equivalent, and, if there is any person that holds a 10 percent or greater beneficial interest, also shall submit links to the websites containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent and the relevant page numbers of the filings that contain the information on each person that holds a 10 percent or greater beneficial interest.”

This Ownership Disclosure Certification form shall be completed, signed and notarized.

16. DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

Pursuant to N.J.S.A. 52:32-5 and N.J.S.A. 18A:64A-25.43, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification enclosed in the bid to attest, under penalty of perjury, that the person or entity, or one of the person or entity, or one of the person or entity's parents, subsidiaries, or affiliates, is not identified on a list created and maintained by the Department of the Treasury as a person or entity engaging in investment activities in Iran. If the Board finds a person or entity to be in violation of the principles which are the subject of this law, they shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the person or entity.

17. N.J.S.A. 10:5-31, et seq. AFFIRMATIVE ACTION

Pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented, the following Affirmative Action Against Discrimination on the Project will be a condition of the Contract. The Bidder, its subconsultants and subcontractors shall comply with the anti-discrimination provisions of N.J.S.A. 10:2-1 et seq., the New Jersey Law Against Discrimination, N.J.S.A. 10:5-1 et seq., N.J.A.C. 17:27-1.1 et seq. and shall guarantee to afford equal opportunity in performance of this Agreement in accordance with an affirmative action program approved by the State Treasurer.

18. The Owner has determined that it would be in the best interest of this particular project, and reasonably related to the specific work to be performed, that all bidders be required to participate in an approved apprenticeship program pursuant to standards established under the Department of Wage and Industry Act of 1948 (N.J.S.A. 34:1A-34 et. seq.). This requirement may be met by either showing a written agreement with a Union with an appropriate apprenticeship program, or by maintaining an in-house program that materially follows the guidelines for apprenticeship set forth by the Union of the same trade:

All subcontractors used by the bidder shall also have an approved apprenticeship program.

If a bidder or sub-contractor does not have its own approved apprenticeship program as set forth above, the requirement may be met by showing that the bidder and/or their subcontractor has a written agreement with a Union which has an appropriate apprenticeship program.
INSTRUCTIONS TO BIDDERS

The Bidders shall include with the bid the “Approved Apprenticeship Form for Construction Projects” contained in the Specifications.

19. § 10:2-1. Antidiscrimination provisions

Antidiscrimination provisions. Every contract for or on behalf of the State or any county or municipality or other political subdivision of the State, or any agency of or authority created by any of the foregoing, for the construction, alteration or repair of any public building or public work or for the acquisition of materials, equipment, supplies or services shall contain provisions by which the contractor agrees that:

a. In the hiring of persons for the performance of work under this contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this contract, no contractor, nor any person acting on behalf of such contractor or subcontractor, shall, by reason of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex, discriminate against any person who is qualified and available to perform the work to which the employment relates;

b. No contractor, subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee engaged in the performance of work under this contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under such contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex;

c. There may be deducted from the amount payable to the contractor by the contracting public agency, under this contract, a penalty of $50.00 for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the contract; and

d. This contract may be canceled or terminated by the contracting public agency, and all money due or to become due hereunder may be forfeited, for any violation of this section of the contract occurring after notice to the contractor from the contracting public agency of any prior violation of this section of the contract.

20. DOMESTIC MATERIALS

Contractor shall use only domestic materials whenever available on Public Work.

21. CLAIMS AND SUITS

Contractor shall indicate on the attached form whether it or any of its principal officers, owners, stockholders or partners, who are noted in the ownership disclosure form, are presently (or within the last 12 months) parties to any lawsuit, litigation or criminal proceeding, arbitration, regulatory or administrative proceeding arising from any construction project. If the answer to this question is affirmative, Contractor shall provide a brief description of the proceeding, the specific name of the action, docket number, name of the court or agency in which it is pending and a brief description of the current status of the proceeding.
INSTRUCTIONS TO BIDDERS

22. METHOD OF AWARD - LOWEST RESPONSIBLE BIDDER(S)
The Contract, if awarded, shall be to the lowest responsive and responsible bidder. The low bid
will be determined based on the lowest base bid (with any accepted alternates) submitted by a
responsible bidder (or bidders).

23. SUBSTITUTION REQUESTS
Please refer to Specification Section 01300, "Submittals." "Or Equal" substitutions are permitted
so long as they are equal to or superior to the basis of design and the Contractor takes full
responsibility for all coordination and costs associated with collateral issues related to the
substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes
full responsibility for all substitutions. Substitution submittals shall be made no later than 30
days after Notice to Proceed in order to provide time for comparison review. All submittals after
30 days shall be in strict accordance with the basis of design / specified products. No "or equal"
Substitutions will be considered after 30 days unless the original specified product becomes
unavailable.

24. Form AIA 101, "Standard Form of Agreement Between Owner and Contractor" as modified by
the Owner shall be the standard agreement form used for this project.

25. All references to separate Prime Contractors, each Prime Contractor, Mechanical Contractor,
Electrical Contractor, Plumbing Contractor, or Structural Steel Contractor shall mean the Single
Lump Sum Bid Contractor.

26. MANDATORY ELEC DISCLOSURE REQUIREMENT, P.L. 2005, CHAPTER 271 -
Vendor is advised of its responsibility to file an annual disclosure statement on political
contributions with the New Jersey Election Law Enforcement Commission (ELEC), pursuant to
N.J.S.A. 19:44A-20.13 (P.L. 2005, c. 271, section 3) if the contractor receives contracts in excess
of $50,000 from a public entity in a calendar year. It is the contractor’s responsibility to determine
if filing is necessary. Failure to so file can result in the imposition of financial penalties by ELEC.
Additional information about this requirement is available from ELEC at 888-313-3532 or at
www.elec.state.nj.us.

27. The Owner reserves the right to reject all bids as permitted in N.J.S.A. 18A:64A-25.1 or as
otherwise permitted by law, or to waive minor informalities or non-material exceptions in the
bids.

28. In case of default by the bidder or contractor, the Owner may procure the articles or services from
other sources and hold the bidder or contractor responsible for any excess cost occasioned thereby.

29. The bidder, if awarded the contract, agrees to protect, defend and save harmless the Owner,
against damage for payment for the use of any patented material process, article or devise that may
enter into the manufacture, construction or form a part of the work covered by either order or
contract, and he further agrees to indemnify and save harmless the Owner from suits or actions of
every nature and description brought against it, for, or on account of any injuries or damages
received or sustained by any party or parties by, or from any negligent acts or failure to act of the
contractor, its servants or agents.
INSTRUCTIONS TO BIDDERS

30. Any changes, whiteouts, strikeouts, etc., on the proposal page must be initialed by the person responsible for signing the bid.

31. Bids shall be prepared on forms furnished by the Owner. All blank spaces shall be filled in, by typewriter or ink, and amounts clearly shown.

32. Bids may not be modified after submittal. Bidders may withdraw bids at any time before opening.

33. All bids submitted shall include in the price any applicable permits, or fees required by any other government entity that has jurisdiction to require the same.

34. By submission of bid, the bidder certifies that the merchandise to be furnished will not infringe upon any valid patent or trademark.

35. No vendor shall influence, or attempt to influence or cause to be influenced, any officer or employee to use his/her official capacity in any manner which might tend to impair the objectivity or independence of judgment of said officer or employee.

36. No vendor shall cause or influence, or attempt to cause or influence, any officer or employee to use his/her official capacity to secure unwarranted privileges or advantages for the vendor or any other person.

37. The provisions above shall not be construed to prohibit an officer or employee from contracting with vendors under the same terms and conditions as are offered or made available to members of the general public.

38. Whenever a bid calls for an on-site inspection or a pre-bid meeting, by no means is anyone to assume that answers given at the site inspection or pre-bid meeting to be binding unless confirmed in writing via an addendum prior to the bid opening.

39. The vendor or contractor hereby guarantees that all materials, supplies, and equipment furnished or delivered to the Owner as listed on any bid, request for proposal, quotation, contract or purchase order meet the requirements, specifications and standards as provided for under the Federal Occupational Safety and Health Act of 1970, as from time to time amended and enforced as of the date thereof.

40. New Jersey Worker and Community Right To Know Act, N.J.S.A. 34:5A-1 et seq. provides that each bidder must furnish Owner a "Material Safety Data Sheets" for each product they or their suppliers supply to the Owner for which the act requirements a “Material Safety Data Sheets.” These Material Safety Data Sheets should be submitted during the shop drawing submission process.

41. The bidder should be aware, if awarded the contract, that it will be responsible for any and all subcontractors as well as itself and are required to comply with all applicable local, state, and federal safety, health, and environmental regulations, including provisions for protecting employees and the public from construction hazards.

42. The successful bidder will be required to supply to the Owner, a copy of their safety program and must also include a contact person to resolve any problems that may arise.
INSTRUCTIONS TO BIDDERS

43. Contractor Safety Guidelines

In an effort to provide contractors with an overview of areas of concern, the following information is provided to all general contractors working on the Owner’s property or under the Owner’s auspices. It is the general contractor’s responsibility to insure that their subcontractors are in compliance.

1) The safety of the Owner’s workers and the general public is paramount.
2) An outside contact person is to be provided on each job.
3) Material Safety Data Sheets are to be provided to the Construction Manager during the Shop Drawing Process.
4) Copies of all product MSDS’s are to be maintained on site.
5) The Contractor shall assure compliance with all OSHA & PEOSH regulations. New Jersey’s Indoor Air Quality Standard Section N.J.A.C 12:100-13.5 is available upon request and the Contractor shall be specifically responsible for complying with all other applicable laws, rules and regulations.
6) Any disruption in building services, loud noises or excessive dust should be anticipated and addressed prior to the commencement of the specific work involved and the disturbance eliminated or minimized to the maximum extent possible.
7) The Contractor is responsible for good housekeeping on the construction site. All exits and exit ways are to be kept free and clear of material storage, trash and equipment.
8) Gloucester County has a Hot Work Permit System. Hot work permits are to be secured through the County Fire Marshal at (856) 307-7137.
9) Access to the job site shall be provided to the Owner and its representatives.
10) The Owner reserves the right to stop work if an imminent hazard exists. The costs, if any, created by the work stoppage are the responsibility of the Contractor if the Contractor or one of his subcontractors is determined to be responsible for the imminent hazard.

44. If and when requested by the Owner or the Owner’s Representative, provide all required documentation including Submittals, Shop Drawings, and Cost Information (for materials and installation) for any equipment, systems or components, in order for the Owner to pursue grants and reimbursement through the New Jersey Office of Clean Energy. The Contractor may be required to provide detailed pricing information including invoices of materials and a breakdown of labor or equipment costs as it pertains to individual pieces of equipment, systems or components.
INSTRUCTIONS TO BIDDERS

45. AMERICANS WITH DISABILITIES ACT, 42 U.S.C. 12101

The CONTRACTOR and the OWNER do hereby agree that the provisions of Title II of the Americans with Disabilities Act of 1990 (the "Act") (42 U.S.C. §12101 et seq.), which prohibits discrimination on the basis of disability by public entities in all services, programs and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the OWNER pursuant to this contract, the CONTRACTOR agrees that the performance shall be in strict compliance with the Act or ADA. In the event that the CONTRACTOR, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act or ADA during the performance of this Contract, the CONTRACTOR shall defend the OWNER in any action or administrative proceeding commenced pursuant to this Act or ADA. The CONTRACTOR shall indemnify, protect, and save harmless the OWNER, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages, or whatever kind or nature arising out of or claimed to arise out of the alleged violation. The CONTRACTOR shall at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the OWNER grievance procedure, the CONTRACTOR agrees to abide by any decision of the OWNER which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the OWNER or if the OWNER incurs any expense to cure a violation of the Act or ADA which has been brought pursuant to its grievance procedure, the CONTRACTOR shall satisfy and discharge the same at its own expense.

The OWNER shall, as soon as practicable after a claim has been made against it, give written notice thereof to the CONTRACTOR along with full and complete particulars of the claim. If any action or administrative proceedings is brought against the OWNER or any of its agents, servants, and employees, the OWNER shall expeditiously forward or have forwarded to the CONTRACTOR every demand, complaint, notice, summons, pleading, or other process received by the OWNER or its representatives. It is expressly agreed and understood that any approval by the OWNER of the services provided by the CONTRACTOR pursuant to this contract will not relieve the CONTRACTOR of the obligation to comply with the Act or ADA and to defend, indemnify, protect, and save harmless the OWNER pursuant to this paragraph. It is further agreed and understood that the OWNER assumes no obligation to indemnify or save harmless the CONTRACTOR, its agents, servants, employees and subcontractors for any claim which may arise out to their performance of this Agreement. Furthermore, the CONTRACTOR expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the CONTRACTOR'S obligations assumed in this agreement, nor shall they be construed to relieve the CONTRACTOR from any liability, nor preclude the OWNER from taking any other actions available to it under any other provisions of the Agreement or otherwise at law.
INSTRUCTIONS TO BIDDERS

46. STUDENT AND FACULTY SAFETY REQUIREMENTS:

All personnel or agents of the Contractor shall observe all rules and regulations in effect at the Owner’s premises. Employees or agents of the Contractor, while on the Owner’s property, shall be subject to the Owner’s enforcement of rules and regulations in effect at the Owner’s premises, but under no circumstances shall such persons be deemed to be employees or agents of the Owner. Contractor’s personnel are required to sign in at the Main Office each time they report for service.

Contractor’s personnel are not to engage with any activities with the students, staff or other Owner’s employees unless duly authorized to do so in writing by the Owner’s representative. Contractor’s personnel are to wear uniforms whenever possible. All contracted personnel are required to wear identification badges identifying the individual and the firm for which they are employed. The Contractor shall assume full responsibility for the actions of all personnel in their employ. The Contractor shall maintain proper supervision of the work in progress at all times.

All personnel used by the Contractor for the performance of this work shall be properly trained and qualified for work of this type and shall have the minimum ability and experience for his classification. Owner reserves the right to refuse to accept services from any personnel deemed by the Owner or its representative to be unqualified, disorderly, or unable to perform assigned work. The Contractor shall provide evidence of qualifications for any personnel performing work under contract upon request.

Owner (and/or the Owner’s Representatives) reserves the right to direct the removal from the site of any person, equipment and/or entity which displays inappropriate behavior, including but not limited to, alcohol consumption, drugs, fighting, intimidating or disruptive behavior, vandalism, theft, improper storage, illegal acts, unfit persons etc.

47. RECORD MAINTENANCE

Pursuant to N.J.A.C. 17:44-2.2, the Contractor shall maintain all documentation related to products, transactions or services under this Contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.

48. PROJECT LABOR AGREEMENT

This Project is subject to a Project Labor Agreement (PLA). The successful bidder and its subcontractors, as applicable, will be bound by the terms and conditions of the PLA. The successful bidder must also execute the Letter of Assent, in the form provided. The successful bidder’s subcontractors (of any tier) as applicable, must also execute the requisite Letter of Assent.

END OF SECTION

INSTRUCTIONS TO BIDDERS
BID FORM - PART A

(DUPLICATE IF NECESSARY)

DATE: __________________________

Bidder's Information: (Print or Type)

Company Name: __________________________

Contact Name: __________________________

Contact Email Address: __________________________

Company Address: _______________________________________

Telephone Number: __________________________ Fax Number: __________________________

Rowan College at Gloucester County
1400 Tanyard Road
Sewell, NJ 08080

Ladies and Gentlemen:

This Proposal is submitted in accordance with your Advertisement inviting proposals to be received for the Economic Development Center and Rowan Medicine. Having carefully examined the Contract Documents and being familiar with various conditions affecting the work, the undersigned herein agrees to furnish all materials, perform all labor and do all else necessary to complete the ENTIRE PROJECT in accordance with said Contract Documents for the LUMP SUM BASE BID OF:

BID AMOUNT $________________________

PLUS CASH ALLOWANCE (SECTION 01210 ALLOWANCES) $400,000.00

TOTAL BASE BID (In Numbers) (Bid Amount Plus Cash Allowance) $________________________

(In words)
Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.

Accompanying this Proposal is a certified check, cashier's check or Bid Bond required by Paragraph 4a of the Instructions to Bidders, which is deposited as a Proposal guarantee, and is to be retained by you and applied as provided in Paragraph 4 of Instructions to Bidders, in case the undersigned shall default in executing the Contract or in furnishing the required bonds and insurance certificates within the time specified by the Contract Documents.

The undersigned hereby certifies that this Proposal is genuine and not sham or collusive or made in the interest of or in behalf of any person, firm or corporation not herein named and that the undersigned has not directly or indirectly induced or solicited any bidder to refrain from bidding and that the undersigned has not in any manner sought by collusion to secure for himself any advantages over any other bidder.
BID FORM - PART A

The undersigned, intending to be legally bound, agrees that this Proposal shall be irrevocable and shall remain subject to your acceptance for 60 days after date set for bid opening.

The undersigned submits this Proposal with the full knowledge of the Contract requirements and hereby agrees that the work of this Project, under this Contract, shall be fully and finally completed and ready for occupancy in accordance with the date found in the Advertisement and / or “Section 01010 - Summary of Work”.

NAME OF BIDDER

SIGNATURE

DATE

BID FORM - PART A
1.1 GENERAL

A. An alternate is an amount proposed by bidders and stated on the Bid Form for certain work that may be added to or deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents. The criteria for accepting alternates is to maximize the benefit to the Owner.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

B. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate that Work into the Project.

C. Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each alternate. The Contractor shall enter the amount to be added or deducted from the base contract amount for each alternate listed below. Fill in "0" or N/A if no work or cost is associated with an alternate.

1.2 PRODUCTS (Not Applicable)

1.3 EXECUTION

SCHEDULE OF ALTERNATES

1. ROWAN MEDICINE: At the Rowan Medicine Building provide Wall Protection in accordance with Specification Section 10260 – Wall Protection, including wall accent rails, wall protection panels and corner guards in the corridors of all four (4) clinical suites. The Base Bid includes the hallway walls in the main lobby area of the Rowan Medicine Building.

Alternate #1 Add $______________________________

2. ROWAN MEDICINE: At the Rowan Medicine Building ONLY provide a Deduct Alternate Price to delete the Workstation cabling System Scope of Work as described in Specification Section 16555 – Telecommunications and Low Voltage Cabling System. The Base Bid includes this Scope of Work for the Rowan Medicine Building and the Workforce Development Building. This Alternate shall be a deduct for only the Rowan Medicine portion of this scope.

Alternate #2 DEDUCT $______________________________

END OF SECTION
SUBCONTRACTOR LIST

The Prime Subcontractors listed below must be DPMC pre-qualified. The Bidder shall provide for each such Prime Subcontractor listed below, a valid and active DPMC Notice of Classification, a Total Amount of Uncompleted Contracts Affidavit (form DBC 701), No Material Adverse Change in Circumstances Form. The Owner is requesting that a Public Works Contractor Registration Certificate and a Business Registration Form for each Subcontractor listed below be included with the bid.

The following is a list of subcontractor(s) to complete:

ELECTRICAL WORK INCLUDING ANY ELECTRICAL POWER PLANTS, TELE-DATA, FIRE ALARM OR SECURITY SYSTEMS:

1. ____________________________
   (Name of Subcontractor)
   ____________________________
   (License Number)

PLUMBING AND GAS FITTING WORK:

1. ____________________________
   (Name of Subcontractor)
   ____________________________
   (License Number)

REFRIGERATION, HEATING, VENTILATING SYSTEMS AND EQUIPMENT:

1. ____________________________
   (Name of Subcontractor)
   ____________________________
   (License Number)

STRUCTURAL STEEL & ORNAMENTAL IRON WORK:

1. ____________________________
   (Name of Subcontractor)
   ____________________________
   (License Number)

I hereby certify that the above-listed subcontractor(s) have provided price quotations to this bidder; and if this bid is accepted shall be the subcontractor(s) retained.

Signature: ____________________________
   (Bidder)

Sworn and subscribed

before me this ______
   day of _________ 20__

NOTE:
Failure to complete and sign this certification and include it with your bid package shall result in your bid being deemed incomplete pursuant to N.J.S.A. 18A:64A-25.25.

Do not leave the subcontractor pages blank. If you do not intend to use any subcontractors, then you must so state that you will not be using subcontractors in the appropriate place on each page. If you plan to use in-house employees for this trade, then you must include with your bid the name of the license holder for this trade and a copy of his/her license.

SUBCONTRACTOR LIST
ACKNOWLEDGMENT OF RECEIPT OF ADDENDA / CLARIFICATIONS

The undersigned Bidder hereby acknowledges receipt of the following Addenda:

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☐ Check here if No Addenda / Clarifications were issued.

Acknowledged for: ______________________________________
(Name of Bidder)

By: ______________________________________
(Signature of Authorized Representative)

Name: ______________________________________

Title: ______________________________________

FAILURE TO ACKNOWLEDGE AND RETURN WITH YOUR BID SUBMISSION THE RECEIPT OF ANY ISSUED ADDENDA FOR THIS BID ON THIS ACKNOWLEDGMENT OF RECEIPT OF ADDENDA FORM MAY BE CAUSE FOR YOUR BID TO BE REJECTED.
INDEMNIFICATION AND HOLD HARMLESS AGREEMENT

Contractor, for itself, its successors and assigns, agrees to defend, indemnify and save Owner, its successors, assigns, employees, agents, construction managers, architects and engineers, harmless from, and against any and all claims, demands, damages, actions or causes of action, together with any and all losses, costs or expenses in connection therewith or related thereto, including but not limited to attorney fees and costs of suit, for bodily injuries, death including bodily injury or death to an employee or subcontractor of Contractor for property damage arising in or in any manner growing out of the work performed, or to be performed under this Contract but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18 of the AIA Document A201-2017 General Conditions of the Contract for Construction. Contractor, of itself, its successors and assigns, agrees to defend and indemnify and hold the Owner, its successors, assigns, employees, agents, construction managers, architects, and engineers harmless against all fines, penalties or losses incurred for, including but not limited to attorney fees and costs of suit, or by reason of the violation by Contractor in the performance of this Contract, of any ordinance, regulation, rule of law of any political subdivision or duly constituted public authority.

Full Name of Contractor: ____________________________________________

Business Address: ________________________________________________

Telephone Number: (____) ___________ Zip Code_______________________

Project Description: ______________________________________________

Signature / Authorized Person ________________________________________

Print Name: ______________________________________________________

Witness Signature ________________________________________________

Print Name: ______________________________________________________

---SUBMIT WITH BID---
CERTIFICATION REGARDING THE DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION LOWER TIER COVERED TRANSACTIONS

I am ______________________ of the firm of ____________________________.

_Title_ (Organization)

_Address of Organization_

CHOOSE ONE OF THE FOLLOWING

( ) A. I hereby certify on behalf of ____________________________ that neither it nor its principals are debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal, state or local department or agency or the State of New Jersey Treasurer's List of Debarred, Suspended and Disqualified Bidders.

( ) B. I am unable to certify to any of the statements set forth in this certification. I have attached an explanation to this form.

(Signature)

(Type Name and Title)

(Date)
INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this certification, the contracting firm is providing the certification as set out below.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the contracting firm knowingly rendered an erroneous certification, in addition to other remedies available to the Federal or State Government, the Owner may pursue available remedies including suspension and/or debarment.

3. The contracting firm shall provide immediate written notice to the Owner if at any time it learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.


5. The contracting firm agrees by submitting this certification that, should the covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction.

6. The contracting firm further agrees by submitting this certification that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," without modification, in all subcontracts to this agreement as authorized by the Owner.
Apprenticeship is training in occupations that require a wide and diverse range of skills and knowledge, as well as maturity and independence of judgment. It involves planned, day-by-day training on the job and experience under proper supervision, combined with related technical instruction.

As practiced by modern industry, apprenticeship is a business-like system designed to provide workers entering industry with comprehensive training by exposing them to the practical and theoretical aspects of the work required in a highly skilled occupation. This is accomplished through structured training on the job and related theoretical instruction.

Under the National Apprenticeship Act, the Bureau of Apprenticeship and Training (BAT) is responsible for providing service to existing apprenticeship programs and technical assistance to organizations that would like to establish an apprenticeship program. The Bureau works very closely with State Apprenticeship Councils (SAC) and the educational system to deliver support services at the National, State and local level.

Approved Apprenticeship programs are usually available through local County Vocational Schools, through various Union Locals, and/or through the U.S. Department of Labor.

The U.S. Department of Labor for New Jersey may be reached at:
US Department of Labor
Bureau of Apprenticeship & Training
485 Route 1 South
Bldg. “E,” Room 300
Iselin, New Jersey 08830

The Owner has determined that it would be in the best interest of this particular project, and reasonably related to the specific work to be performed, that all bidders be required to participate in an approved apprenticeship program pursuant to standards established under the Department of Wage and Industry Act of 1948 (N.J.S.A. 34:1A-34 et. seq.). This requirement may be met by either showing a written agreement with a Union with an appropriate apprenticeship program, or by maintaining an in-house program that materially follows the guidelines for apprenticeship set forth by the Union of the same trade:

All subcontractors used by the bidder shall also have an approved apprenticeship program.

If a bidder or sub-contractor does not have its own approved apprenticeship program as set forth above, the requirement may be met by showing that the bidder and/or their subcontractor has a written agreement with a Union which has an appropriate apprenticeship program.
## APPROVED APPRENTICESHIP FORM FOR CONSTRUCTION PROJECTS

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<th>LIST OF TRADES FOR THIS PROJECT</th>
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AFFIRMATIVE ACTION REQUIREMENTS

Bidder is required to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27

1. After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Dept. of LWD, Construction EEO Monitoring Program an Initial Project Workforce Report (Form AA-201) electronically provided to the public agency by the Dept. of LWD, Construction EEO Monitoring Program, through its website, for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7.

2. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Dept. of LWD, Construction EEO Monitoring Program, and to the public agency compliance officer.

The undersigned certifies that he/she is aware of the commitment to comply with the requirements of N.J.S.A. 10:5-31 et seq. and N.J.A.C. 17:27 and agrees to furnish the required forms of evidence.

Subscribed and sworn to before me this

______________

day of ______________, 201__.

My Commission expires:

______________________________

Date

Signature

______________________________

Name and Title

(Type or Print)
EXHIBIT B

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE

N.J.S.A. 10:5-31 et seq. (P.L.1975, c.127)
N.J.A.C. 17:27-1.1 et seq.

CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. 17:27-7.2; provided, however, that the Dept. of LWD, Construction EEO Monitoring Program, may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B, and C, as long as the Dept. of LWD, Construction EEO Monitoring Program is satisfied that the contractor or subcontractor is employing workers
EXHIBIT B (Cont)

provided by a union which provides evidence, in accordance with standards prescribed by the Dept. of LWD, Construction EEO Monitoring Program, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with N.J.A.C. 17:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

(1) To notify the public agency compliance officer, the Dept. of LWD, Construction EEO Monitoring Program, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;
EXHIBIT B (Cont)

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and nondiscrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) The contactor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Dept. of LWD, Construction EEO Monitoring Program. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Dept. of LWD, Construction EEO Monitoring Program, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Dept. of LWD, Construction EEO Monitoring Program.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Dept. of LWD, Construction EEO Monitoring Program and submitted promptly to the Dept. of LWD, Construction EEO Monitoring Program upon request.
EXHIBIT B (Cont)

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Dept. of LWD, Construction EEO Monitoring Program an initial project workforce report (Form AA-201) electronically provided to the public agency by the Dept. of LWD, Construction EEO Monitoring Program, through its web-site, for distribution to and completion by the contractor, in accordance with. N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Dept. of LWD, Construction EEO Monitoring Program, and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Dept. of LWD, Construction EEO Monitoring Program as may be requested by the Dept. of LWD, Construction EEO Monitoring Program from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Dept. of LWD, Construction EEO Monitoring Program for conducting a compliance investigation pursuant to N.J.A.C. 17:27-1.1 et seq.

COMPANY: ____________________________ SIGNATURE: ____________________________

PRINT NAME: ____________________________ TITLE: ____________________________

DATE: ____________________________
As required by law, you must pay prevailing wages. In addition, any sub-contractor you employ must also pay prevailing wages. It is your responsibility to make sure your subcontractors are paying prevailing wages.

Gloucester County has a Wage and Hour Compliance Office. A representative of that office will periodically interview your employees on this project to confirm that they are, in fact, receiving the New Jersey prevailing wages and benefits.

In addition, immediately upon beginning the project, you must provide a certified copy of your weekly/bi-weekly payroll records and your subcontractors. Also your certified payroll must show hourly benefits and gross benefits that are paid each employee as set forth by New Jersey prevailing rates.

Hourly rate  
Total hours  
Hourly benefits  
Gross benefits  
Gross pay

Should any apprentice from another state presently be working in the State of New Jersey, they must now be paid the full journeyman’s rate, unless they are a member of a collective bargaining unit whose jurisdiction, according to the agreement, covers territory within New Jersey.

The Wage and Hour Compliance Office is located at County of Gloucester, Old Court House 1 North Broad St. Woodbury, New Jersey 08096. Payrolls must be sent to the office within ten (10) days of payment of wages.

Should this be a non-union contractual firm, your employees are to receive the New Jersey prevailing rates plus all benefits in their weekly/bi-weekly wages.

Should contractor(s)/subcontractor(s) be from another state, the New Jersey prevailing wage determination and benefits must be paid.

You are to forward to the Office of Wage and Hour Compliance the initial manning report and the Monthly Project Manning Report. Copies to be sent as designated. Failure to comply and submit certified payrolls and manning reports could result in a stop payment order on any monies due. Additionally, any forms to be completed by the primary or subcontractors must be returned to the Office of Wage and Hour Compliance prior to the start of any project.

Signed:  
______________________________  
(Contractor)

Date:  
______________________________  
(Contractor T/A)

______________________________  
(Telephone and Address)

______________________________  
(Construction Location)

Failure to comply and submit certified payrolls and manning reports could result in a stop payment of any monies due.
NON-COLLUSION AFFIDAVIT

THIS FORM MUST ACCOMPANY BID

STATE OF NEW JERSEY \)
COUNTY OF \)

I, \ of the City of \ in the County of, \ and the State of \, of full age, being duly sworn according to law on my oath depose and say that: I am of the firm of \, the bidder making this Proposal/Bid for the Economic Development Center and Rowan Medicine, and that I executed the said Bid with full authority so to do; that said bidder had not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the Economic Development Center and Rowan Medicine; and that all statements contained in said Bid and in this affidavit are true and correct, and made with full knowledge that the Owner relies upon the truth of the statements contained in said Bid and in the statements contained in this affidavit in awarding the contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by

_________________________ (N.J.S.A. 52:34-15)

(Name of Bidder)

Bidder’s Signature

Sworn to and subscribed before me

this ___ day of ________________________, 20__.

_________________________

Notary Public of

My Commission expires ________________ 20__
STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
33 W. STATE STREET
PO BOX 034
TRENTON, NEW JERSEY 08625-0034

TOTAL AMOUNT OF UNCOMPLETED CONTRACTS

I Certify that the amount of uncompleted work on contracts is $________________________.

The amount claimed includes uncompleted portions of all currently held contracts from all sources (public and private) in accordance with N.J.A.C. 1 7:19-2.13.

I further certify that the amount of this bid proposal, including all outstanding incomplete contracts does not exceed my Division of Property Management and Construction prequalification dollar limit.

By: ____________________________

Name of Firm

Signature: ____________________________

Title: ____________________________

Business Address: ____________________________

______________________________

Sworn to and subscribed before me this __________day of __________, 2019.

______________________________

Notary Public
NO MATERIAL CHANGE OF CIRCUMSTANCES

AFFIDAVIT

I, __________________________ being of full age under oath depose and say:

1. I am a(n) owner, partner, shareholder or officer of the company set forth below and am duly authorized to execute this affidavit on its behalf.

2. A statement as to the financial ability, adequacy of plant and equipment, organization and prior experience of [Bidder], has been submitted to the Department of Treasury within one (1) year preceding the date of opening of bids for this contract.

3. I certify, that there has been no material adverse change in the qualification information of [Bidder] since such statement was submitted to the Department of Treasury except:

   ___________________________________________________________________

SEAL

SIGNATURE

TITLE

COMPANY

Sworn to and subscribed before me this ______ day of ______, 20______

Notary Public
STATEMENT OF OWNERSHIP
(OWNERSHIP DISCLOSURE CERTIFICATION)

This Statement Shall Be Included with
All Bid and Proposal Submissions

Name of Business:

Address of Business:

Name of person completing this form:

N.J.S.A. 52:25-24.2:

"No corporation, partnership, or limited liability company shall be awarded any contract nor shall any agreement be entered into for the performance of any work or the furnishing of any materials or supplies, unless prior to the receipt of the bid or proposal, or accompanying the bid or proposal of said corporation, said partnership, or said limited liability company there is submitted a statement setting forth the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be.

If one or more such stockholder or partner or member is itself a corporation or partnership or limited liability company, the stockholders holding 10 percent or more of that corporation’s stock, or the individual partners owning 10 percent or greater interest in that partnership, or the members owning 10 percent or greater interest in that limited liability company, as the case may be, shall also be listed. The disclosure shall be continued until names and addresses of every non-corporate stockholder, and individual partner, and member, exceeding the 10 percent ownership criteria established in this act, has been listed.

To comply with this section, a bidder with any direct or indirect parent entity which is publicly traded may submit the name and address of each publicly traded entity and the name and address of each person that holds a 10 percent or greater beneficial interest in the publicly traded entity as of the last annual filing with the federal Securities and Exchange Commission or the foreign equivalent, and, if there is any person that holds a 10 percent or greater beneficial interest, also shall submit links to the websites containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent and the relevant page numbers of the filings that contain the information on each person that holds a 10 percent or greater beneficial interest."

This Ownership Disclosure Certification form shall be completed, signed and notarized.
Failure of the bidder/proposer to submit the required information is cause for automatic rejection of the bid or proposal

Part I

Check the box that represents the type of business organization:

☐ Sole Proprietorship (skip Parts II and III, sign and notarize at the end)
☐ Non-Profit Corporation (skip Parts II and III, sign and notarize at the end)
☐ Partnership ☐ Limited Partnership ☐ Limited Liability Partnership
☐ Limited Liability Company
☐ For-profit Corporation (including Subchapters C and S or Professional Corporation)
☐ Other (be specific): ________________________________________________________

Part II

☐ I certify that the list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be.

OR

☐ I certify that no one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or that no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be.

Sign and notarize the form below, and, if necessary, complete the list below. (Please attach additional sheets if more space is needed):
Part III - Any Direct or Indirect Parent Entity Which is Publicly Traded:

"To comply with this section, a bidder with any direct or indirect parent entity which is publicly traded may submit the name and address of each publicly traded entity and the name and address of each person that holds a 10 percent or greater beneficial interest in the publicly traded entity as of the last annual filing with the federal Securities and Exchange Commission or the foreign equivalent, and, if there is any person that holds a 10 percent or greater beneficial interest, also shall submit links to the websites containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent and the relevant page numbers of the filings that contain the information on each person that holds a 10 percent or greater beneficial interest."

☐ Pages attached with name and address of each publicly traded entity as well as the name and address of each person that holds a 10 percent or greater beneficial interest.

OR

☐ Submit here the links to the Websites (URLs) containing the last annual filings with the federal Securities and Exchange Commission or the foreign equivalent.

AND

☐ Submit here the relevant page numbers of the filings containing the information on each person holding a 10 percent or greater beneficial interest.

________________________________________

Subscribed and sworn before me this __ day of ______________________, 20________.

(Affiant)

(Notary Public)

My Commission expires: ________________________________

(Print name of affiant and title if applicable)

(Corporate Seal if a Corporation)

Statement of Ownership
DISCLOSURE OF CLAIMS AND SUITS
(¶21 of Instruction to Bidders)

Contractor shall indicate below whether it or any of its principals, officers, owners, stockholders or partners who are noted on the ownership disclosure form are presently (or within the last 12 months) parties to any lawsuit, litigation or criminal proceeding, arbitration, regulatory or administrative proceeding arising from any construction project. Use additional sheets if necessary.

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ROWAN COLLEGE AT GLOUCESTER COUNTY
DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

Quote Number: __________________________ Bidder/Offeror: __________________________

PART 1: CERTIFICATION
BIDDERS MUST COMPLETE PART 1 BY CHECKING EITHER BOX.
FAILURE TO CHECK ONE OF THE BOXES WILL RENDER THE PROPOSAL NON-RESPONSIVE

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division's website at http://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Bidders must review this list prior to completing the below certification. Failure to complete the certification will render a bidder's proposal non-responsive. If the Director finds a person or entity to be in violation of law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party

PLEASE CHECK THE APPROPRIATE BOX:

☐ I certify, pursuant to Public Law 2012, c. 25, that neither the bidder listed above nor any of the bidder's parents, subsidiaries, or affiliates is listed on the N.J. department of the Treasury's list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25 List"). I further certify that I am the person listed above, or I am an officer or representative of the entity listed above and am authorized to make this certification on its behalf. I will skip Part 2 and sign and complete the Certification below.

OR

☐ I am unable to certify as above because the bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department's Chapter 25 list. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below. Failure to provide such will result in the proposal being rendered as non-responsive and appropriate penalties, fines and/or sanctions will be assessed as provided by law.

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the boxes below.

EACH BOX WILL PROMPT YOU TO PROVIDE INFORMATION RELATIVE TO THE ABOVE QUESTIONS. PLEASE PROVIDE THOROUGH ANSWERS TO EACH QUESTION. IF YOU NEED TO MAKE ADDITIONAL ENTRIES, CLICK THE "ADD AN ADDITIONAL ACTIVITIES ENTRY" BUTTON.

Name: __________________________ Relationship to Bidder/Offeror: __________________________

Description of Activities: ____________________________________________________________

Duration of Engagement: _______________ Anticipated Cessation Date: _______________

Bidder/Offer or Contact Name: ______________ Contact Phone Number: _______________

☐ ADD AN ADDITIONAL ACTIVITIES ENTRY
Certification: I, being duly sworn upon my oath, hereby represent and state that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I attest that I am authorized to execute this certification on behalf of the above-referenced person or entity. I acknowledge that the State of New Jersey is relying on the information contained herein and thereby acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contracts with the State to notify the State in writing of any changes to the answers of information contained herein. I acknowledge that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I recognize that I am subject to criminal prosecution under the law and that it will also constitute a material breach of my agreement(s) with the State of New Jersey and that the State at its option may declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print): __________________________________________

Signature: __________________________________________

Title: __________________________________________

Date: __________________________________________
BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, ______________________

Company Name

Company Address

as Principal, and ______________________

Insurance Company Name

Insurance Company Address

as Surety, are hereby and firmly bound unto Rowan College at Gloucester County, 1400
Tanyard Road, Sewell, New Jersey 08080 as Owner, in the penal sum of Ten Percent (10%) of
the Amount of Bid, pursuant to N.J.S.A. 18A:64A-25.16, for the payment of which, well and
truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors,
administrators, successors and assigns.

Signed, this _______ Day of __________________, 20____.

The condition of the above obligation is such that, whereas the Principal has submitted to Rowan
College at Gloucester County a certain bid, attached hereto and hereby made a part hereof to
enter into a contract in writing for the Economic Development Center and Rowan Medicine.

NOW, THEREFORE,
(a) If said Bid shall be rejected, or in the alternate,
(b) If said Bid shall be accepted and the Principal shall execute and deliver an AIA
Document A101 Standard Form of Agreement Between Owner and Contractor (properly
completed in accordance with said Bid) and shall furnish a bond for his faithful
performance of said contract, and for the payment of all persons performing labor or
furnishing materials in connection therewith, and shall in all other respects perform the
agreement created by the acceptance of the Bid,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being
expressly understood and agreed that the liability of the Surety for any and all claims thereunder
shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligation of said Surety and
its bond shall be in no way impaired or affected by an extension of the time within which the
Owner may accept such bid; and said Surety does hereby waive notice of any such extension.
IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper offer, the day and year first set forth above.

________________________________________
Company Name

Attest / Witness

By: ________________________________
Signature

Name and Title

Insurance Company Name

By: ________________________________
Signature

Name and Title

ANY BOND COMPLYING WITH THE REQUIREMENTS OF N.J.S.A 18A:64A-25.16 MAY BE USED.
SURETY DISCLOSURE STATEMENT AND CERTIFICATION

___________________________, surety(ies) on the attached bond, hereby certifies(y) the following:

(1) The surety meets the applicable capital and surplus requirements of R.S. 17:17-6 or R.S. 17:17-7 as of the surety's most current annual filing with the New Jersey Department of Insurance.

(2) The capital (where applicable) and surplus, as determined in accordance with the applicable laws of this State, of the surety(ies) participating in the issuance of the attached bond is (are) in the following amount(s) as of the calendar year ended December 31, _________ (most recent calendar year for which capital and surplus amounts are available), which amounts have been certified as indicated by certified public accountants (indicating separately for each surety that surety's capital and surplus amounts, together with the name and address of the firm of certified public accounts that shall have certified those amounts):

                                                                                           
                                                                                           
                                                                                           
                                                                                           
(3) (a) With respect to each surety participating in the issuance of the attached bond that has received from the United States Secretary of the Treasury a certificate of authority pursuant to 31 U.S.C. § 9305, the underwriting limitation established therein and the date as of which that limitation was effective is as follows (indicating for each such surety that surety's underwriting limitation and the effective date thereof):

                                                                                           
                                                                                           
                                                                                           
                                                                                           
BID BOND                                             Page 3 of 5
(b) With respect to each surety participating in the issuance of the attached bond that has not received such a certificate of authority from the United States Secretary of the Treasury, the underwriting limitation of that surety as established pursuant to R.S. 17:18-9 as of (date on which such limitation was so established) is as follows (indicating for each such surety that surety's underwriting limitation and the date on which that limitation was established):


(4) The amount of the bond to which this statement and certification is attached is $__________________.

(5) If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in items (3)(a) or (3)(b) above, or both, then for each such contract of reinsurance:

(a) The name and address of each such reinsurer under that contract and the amount of that reinsurer's participation in the contract is as follows:


(b) Each surety that is party to any such contract of reinsurance certifies that each reinsurer listed under item (5)(a) satisfies the credit for reinsurance requirement established under P.L.1993, c. 243 (C. 17:51B-1 et seq.) and any applicable regulations in effect as of the date on which the bond to which this statement and certification is attached shall have been filed with the appropriate public agency.
CERTIFICATE
(to be completed by an authorized certifying agent
for each surety on the bond)

I, ________________________________ (name of agent), as ________________________________ (title of agent) for ________________________________ (name of surety), a corporation/mutual insurance company/other ______ ________________________________ (indicating type of business organization) (circle one) domiciled in ___________ (state of domicile), DO HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements are false, this bond is VOID.

________________________
(Signature of certifying agent)

________________________
(Printed name of certifying agent)

________________________
(Title of certifying agent)
CONSENT OF SURETY

The ________________________________

______________________________

(Name and Address of Surety)

a corporation existing under the Laws of the State of ________________________________

and authorized to do business under the Laws of the State of New Jersey, hereby certifies that application has been made to us by ________________________________

______________________________

(Name and Address of Contractor)

and satisfactory arrangements have been completed by which we have and do now agree to furnish a Performance Bond equal to 100% of the Contract to ensure the faithful performance on the part of the Bidder of the terms and conditions of the contract, and a separate Labor and Materials/Payment Bond, equal to 100% of the Contract Price, to ensure the payment of the persons furnishing labor and materials in accordance with the contract and a Maintenance Bond for two (2) years in the amount of 100% of the Contract Price.

Title of the Work: Economic Development Center and Rowan Medicine

Location of the Project: Rowan College at Gloucester County, 1400 Tanyard Road, Sewell, New Jersey 08080

This proposition is made with the understanding that any change made in the specifications or agreements without the consent of the bondsman shall in no way vitiate the bond.

WITNESS: ________________________________

SURETY COMPANY

______________________________

(Name of Surety Company)

Title: ________________________________

(Attorney-in-fact)

By: ________________________________

Date: ________________________________

(Affix corporate seal)

IMPORTANT NOTE

The Surety Company executing the Bond must be authorized to transact business in the State of New Jersey. For contracts in excess of $850,000, the Surety shall be listed on the Treasury Department’s most current New Jersey List of Approved Sureties, located at www.state.nj.us/dobi/surety.htm.
DISCLOSURE OF CONTRIBUTIONS TO NEW JERSEY ELECTION LAW ENFORCEMENT COMMISSION IN ACCORDANCE WITH N.J.S.A. 19:44A-20.27

STATE OF NEW JERSEY : SS

COUNTY OF

I, ________________________, of ________________________, in the County of ___________ and the State of ___________ of full age, being duly sworn according to law on my oath depose and say that:

I am a ______________ in ________________________, the bidder making the proposal to

ROWAN COLLEGE AT GLOUCESTER COUNTY

(Name of Owner)

for work under

WORKFORCE DEVELOPMENT CENTER AND ROWAN MEDICINE

(Contract No. – Description)

and that I executed the said Proposal with full Authority to do so; that said Bidder acknowledges our responsibility to file an annual disclosure statement of political contributions with the New Jersey Election Law Enforcement Commission (ELEC) pursuant to N.J.S.A. 19:44A-20.27 if in receipt of contracts in excess of $50,000.00 from public entities in a calendar year. I further acknowledge that business entities are solely responsible for determining if filing is necessary and that all statements contained in said Proposal and in this Affidavit are true and correct, and made with full knowledge that the

ROWAN COLLEGE AT GLOUCESTER COUNTY

(Name of Owner)

relies upon the truth of the statements contained in said Proposal and in the statements contained in this Affidavit in awarding the Contract for the said project.

I further warrant that no person or selling agency has been employed or retained to solicit or secure such contract upon an agreement or understanding for commission, percentage brokerage, or contingent fee, except Bona Fide employees of the Contractor, and as may be permitted by law.

Signature: ________________________________

Type or Print Name: ________________________________

Subscribed and Sworn to before me this ______ day of ________________________, 20_______.

__________________________________________
LETTER OF ASSENT

PROJECT LABOR AGREEMENT

The undersigned, as a Prime Contractor or Subcontractor on a Contract which is part of the __________________________ (Project) for and in consideration of the award of a (Name of Project) Contract to perform work on said Project, and in further consideration of the mutual promises made in the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

(1) On behalf of itself and all its employees, accepts and agrees to be bound by terms and conditions of the Project Labor Agreement, together with any and all amendments and supplements now existing or which are later made thereto, and understands that any act of non-compliance with all such terms and conditions, including but not limited to, evidence of compliance with the pre-employment controlled substance testing, will subject the non-complying Contractor or employee(s) to being prohibited from the Project Site until full compliance is obtained.

(2) Certified that it has no commitments or agreements, which would preclude its full compliance with the terms and conditions of said Project Labor Agreement.

(3) Agrees to secure from any Contractor(s) (as defined in said Project Labor Agreement) which is or becomes a Subcontractor(s) (of any tier), a duly executed Letter of Assent in form identical to this document prior to commencement of any work.

Dated: ____________________________ ____________________________

Name of Contractor/Company Signature of Authorized Representative

______________________________ ____________________________

Print Name and Title Contract Number
PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

__________________________________________
(Name of Contractor)

__________________________________________
(Address of Contractor)

__________________________________________
(a Corporation, Partnership or Individual)

__________________________________________
(Name of Surety)

__________________________________________
(Address of Surety)

hereinafter called "SURETY", are held and firmly bound unto ROWAN COLLEGE AT GLOUCESTER COUNTY; hereinafter called "OWNER" in the total aggregate penal sum of ___________________________________ Dollars ($________________)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the __________ day of __________________________, 20___, a copy of which is hereto attached and made a part hereof for:

"ECONOMIC DEVELOPMENT CENTER AND ROWAN MEDICINE".

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the SURETY and during the two-year guaranty period and if the PRINCIPAL shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.
PROVIDED, FURTHER, that the said security, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed hereunder or the SPECIFICATION accompanying same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND or LOC shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER are the only beneficiaries hereunder.

IN WITNESS WHEREOF, this instrument is executed in ________ counterparts, each one of (number) Which shall be deemed an original, this ___ day of __________________________, 20___.

ATTEST:

______________________________  Principal

______________________________  By ________________________________

(SEAL)

______________________________  (Address)

(Witness as to Principal)

______________________________  (Address)
SURETY DISCLOSURE STATEMENT AND CERTIFICATION

__________________________, surety(ies) on the attached bond, hereby
certifies(y) the following:

(1) The surety meets the applicable capital and surplus requirements of R.S. 17:17-
6 or R.S. 17:17-7 as of the surety’s most current annual filing with the New Jersey
Department of Insurance.

(2) The capital (where applicable) and surplus, as determined in accordance with the
applicable laws of this State, of the surety(ies) participating in the issuance of the
attached bond is (are) in the following amount(s) as of the calendar year ended
December 31, _________(most recent calendar year for which capital and surplus
amounts are available), which amounts have been certified as indicated by certified
public accountants (indicating separately for each surety that surety’s capital and
surplus amounts, together with the name and address of the firm of certified public
accounts that shall have certified those amounts):

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

(3) (a) With respect to each surety participating in the issuance of the attached bond
that has received from the United States Secretary of the Treasury a certificate of
authority pursuant to 31 U.S.C. § 9305, the underwriting limitation established
therein and the date as of which that limitation was effective is as follows (indicating
for each such surety that surety’s underwriting limitation and the effective date
thereof):

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
(b) With respect to each surety participating in the issuance of the attached bond that has not received such a certificate of authority from the United States Secretary of the Treasury, the underwriting limitation of that surety as established pursuant to R.S. 17:18-9 as of (date on which such limitation was so established) is as follows (indicating for each such surety that surety's underwriting limitation and the date on which that limitation was established):


(4) The amount of the bond to which this statement and certification is attached is $___________________.

(5) If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in items (3)(a) or (3)(b) above, or both, then for each such contract of reinsurance:

(a) The name and address of each such reinsurer under that contract and the amount of that reinsurer's participation in the contract is as follows:


(b) Each surety that is party to any such contract of reinsurance certifies that each reinsurer listed under item (5)(a) satisfies the credit for reinsurance requirement established under P.L.1993, c. 243 (C. 17:51B-1 et seq.) and any applicable regulations in effect as of the date on which the bond to which this statement and certification is attached shall have been filed with the appropriate public agency.
CERTIFICATE
(to be completed by an authorized certifying agent
for each surety on the bond)

I, _________________________ (name of agent), as ________________________
____________________________________ (title of agent) for ________________________
____________________________________ (name of surety), a corporation/mutual insurance company/other ______
____________________________________ (indicating type of business organization) (circle one) domiciled in _____________ (state of domicile), DO HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements are false, this bond is VOID.

____________________________________
(Signature of certifying agent)

____________________________________
(Printed name of certifying agent)

____________________________________
(Title of certifying agent)
PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_________________________ ____________________________
(Name of Contractor) (Address of Contractor)

a ____________________________ , hereinafter called "PRINCIPAL" and

_________________________, hereinafter

(Name of Surety)
called SURETY, are held and firmly bound unto ROWAN COLLEGE AT GLOUCESTER
COUNTY, hereinafter called OWNER, and unto all persons, firms, and corporations, who or
which may furnish labor, or who furnish materials to perform as described under the contract
and to their successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a
certain contract with the OWNER, dated the _____ day of ______________________, 2019,
a copy of which is hereto attached and made a part hereof for:

“ECONOMIC DEVELOPMENT CENTER AND ROWAN MEDICINE”

NOW, THEREFORE, if the PRINCIPAL shall make prompt payment to all persons, firms, and
corporations furnishing materials for or performing labor in the prosecution of the WORK
provided for in such contract, and any authorized extensions or modification thereof, including
all amount due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery,
equipment and tools, consumed or used in connection with the construction of such WORK, and
for all labor costs incurred in such WORK including that by a SUBCONTRACTOR, and to any
mechanic or materialman or lien-holder, whether it acquires its liens by operation of State or
Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the
SUBCONTRACTOR, and person, firms, and corporations having a direct contract with the
PRINCIPAL; or its SUBCONTRACTORS.

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

PROVIDED, FURTHER, that no suit or action shall be commenced hereunder by any claimant:

(a) Unless claimant, other than one having a direct contract with the PRINCIPAL, shall have
given written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY
above named within ninety (90) days after such claimant did or performed the last of the work or
labor, or furnished the last of the materials for which said claim is made, stating the materials
were furnished, or for whom the work or labor was done or performed. Such notice shall be
served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the State in which the aforesaid project is located, save that such service needs to be made by a public officer.

(b) After the expiration of one (1) year following the date of which PRINCIPAL ceased work on said CONTRACT, it being understood, however, THAT any limitation embodied in the BOND is equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the Contract, or the loan documents, shall include any alteration, additions, extension or modification of any character whatsoever.

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

WITNESS WHEREOF, this instrument is executed in _______ counterparts, each of which shall be deemed an original, this the ______ day of ________________________, 2019.

ATTEST:

(Principal Secretary) 

(SEAL) 

(Principal) 

By ______________________ (s) 

(Address) 

(Witness as to Principal) 

(Address) 

(Surety) 

By ______________________ (Attorney - in Fact) 

(Address) 

(Witness as to Surety) 

(Address) 

NOTE: Date of BOND must not be prior to date of Contract. 
If CONTRACTOR is partnership, all partners should execute BOND. 
IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.
SURETY DISCLOSURE STATEMENT AND CERTIFICATION

__________________________________________, surety(ies) on the attached bond, hereby certifies(y) the following:

(1) The surety meets the applicable capital and surplus requirements of R.S. 17:17-6 or R.S. 17:17-7 as of the surety's most current annual filing with the New Jersey Department of Insurance.

(2) The capital (where applicable) and surplus, as determined in accordance with the applicable laws of this State, of the surety(ies) participating in the issuance of the attached bond is (are) in the following amount(s) as of the calendar year ended December 31, _________ (most recent calendar year for which capital and surplus amounts are available), which amounts have been certified as indicated by certified public accountants (indicating separately for each surety that surety's capital and surplus amounts, together with the name and address of the firm of certified public accounts that shall have certified those amounts):

________________________________________

________________________________________

(3) (a) With respect to each surety participating in the issuance of the attached bond that has received from the United States Secretary of the Treasury a certificate of authority pursuant to 31 U.S.C. § 9305, the underwriting limitation established therein and the date as of which that limitation was effective is as follows (indicating for each such surety that surety's underwriting limitation and the effective date thereof):

________________________________________

________________________________________
(b) With respect to each surety participating in the issuance of the attached bond that has not received such a certificate of authority from the United States Secretary of the Treasury, the underwriting limitation of that surety as established pursuant to R.S. 17:18-9 as of (date on which such limitation was so established) is as follows (indicating for each such surety that surety's underwriting limitation and the date on which that limitation was established):


(4) The amount of the bond to which this statement and certification is attached is $______________.

(5) If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in items (3)(a) or (3)(b) above, or both, then for each such contract of reinsurance:

(a) The name and address of each such reinsurer under that contract and the amount of that reinsurer's participation in the contract is as follows:


(b) Each surety that is party to any such contract of reinsurance certifies that each reinsurer listed under item (5)(a) satisfies the credit for reinsurance requirement established under P.L.1993, c. 243 (C. 17:51B-1 et seq.) and any applicable regulations in effect as of the date on which the bond to which this statement and certification is attached shall have been filed with the appropriate public agency.
CERTIFICATE
(to be completed by an authorized certifying agent 
for each surety on the bond)

I, ____________________________ (name of agent), as __________________
________________________________________________________ (title of agent) for ____________________________ (name of surety), a corporation/mutual insurance company/other ___
________________________________________________________ (indicating type of business 
organization) (circle one) domiciled in ____________ (state of domicile), DO 
HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements are false, this bond is VOID.

__________________
(Signature of certifying agent)

__________________
(Printed name of certifying agent)

__________________
(Title of certifying agent)
MAINTENANCE
BOND

Bond No:________________

KNOW ALL MEN BY THESE PRESENTS, That we, ________________________, as Principal, and ________________________, INSURANCE COMPANY OF AMERICA, a corporation duly organized under and by the virtue of the laws of the State of New Jersey and authorized to become sole surety on bonds in the State of New Jersey, as Surety, are held and firmly bound unto Rowan College at Gloucester County, 1400 Tanyard Road, Sewell, NJ 08080, hereinafter called Obligee, in the just and penal sum of ____________________________ Dollars ($_____________________), lawful money of the United States of America, to the payment of which well and truly to be made the Principal binds itself, its successors and assigns, and the Surety binds itself, its successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has by means of a written agreement, dated ___________ contracted with the Obligee aforesaid, for furnishing all materials and performing all of the work in connection with ECONOMIC DEVELOPMENT CENTER AND ROWAN MEDICINE as specifically set forth in said contract for said work, and

WHEREAS, the Principal has completed the said contract in accordance with the plans and specifications thereof, and

WHEREAS, the Obligee has requested the Principal to guarantee said work against defective workmanship or faulty materials for a period of two (2) years from date of acceptance of said work _________________; and

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Principal shall well and truly make good any defects in material or workmanship which may arise in said work within two (2) years from the date of acceptance of said work, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

IN WITNESS WHEREOF, we have set our hands and seals this ______ day of _________________, 20__.

______________________________ (SEAL)
Principal

____________________________
Surety
STATE OF NEW JERSEY  
DEPARTMENT OF LABOR & WORKFORCE DEVELOPMENT  
CONSTRUCTION EEO COMPLIANCE MONITORING PROGRAM  

INITIAL PROJECT WORKFORCE REPORT CONSTRUCTION  

For instructions on completing the form, go to: http://www.state.nj.us/treasury/contract_compliance/pdf/aa201ins.pdf  

1. FID NUMBER  
2. CONTRACTOR ID NUMBER  

3. NAME AND ADDRESS OF PRIME CONTRACTOR  
   Name:  
   Address:  
   (Name)  
   (Street Address)  
   (City)  
   (State)  
   (Zip Code)  

4. IS THIS COMPANY MINORITY OWNED [ ] OR WOMAN OWNED [ ]  

5. NAME AND ADDRESS OF PUBLIC AGENCY AWARDED CONTRACT  
   Name:  
   Address:  
   CONTRACT NUMBER  
   DATE OF AWARD  
   DOLLAR AMOUNT OF AWARD  

6. NAME AND ADDRESS OF PROJECT  
   Name:  
   Address:  
   COUNTY  
   8. IS THIS PROJECT COVERED BY A PROJECT LAbOR AGREEMENT (PLA)? YES [ ]  

9. TRADE OR CRAFT  
   TRADE OR CRAFT:  
   PROJECTED TOTAL EMPLOYEES  
   PROJECTED MINORITY EMPLOYEES  
   PROJECTED PHASE-IN DATE  
   PROJECTED COMPLETION DATE  
   MALE  |  FEMALE  
   MALE  |  FEMALE  
   j  |  AP  |  j  |  AP  |  j  |  AP  |  j  |  AP  

1. ASBESTOS WORKER  
2. BRICKLAYER OR MASON  
3. CARPENTER  
4. ELECTRICIAN  
5. GLAZIER  
6. HVAC MECHANIC  
7. IRONWORKER  
8. OPERATING ENGINEER  
9. PAINTER  
10. PLUMBER  
11. ROOFER  
12. SHEET METAL WORKER  
13. SPRINKLER FITTER  
14. STEAMFITTER  
15. SURVEYOR  
16. TILER  
17. TRUCK DRIVER  
18. LABORER  
19. OTHER  
20. OTHER  

I hereby certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements are willfully false, I am subject to punishment.  

(Signature)  

(Area Code)  (Telephone Number)  (Ext.)  (Date)
INSTRUCTIONS FOR COMPLETING THE INITIAL PROJECT WORKFORCE REPORT – CONSTRUCTION (AA201)

DO NOT COMPLETE THIS FORM FOR GOODS AND/OR SERVICE CONTRACTS

1. Enter the Federal Identification Number assigned to the contractor by the Internal Revenue Service, or if a Federal Employer Identification Number has been applied for but not yet issued, or if your business is such that you have not or will not receive a Federal Identification Number, enter the social security number assigned to the single owner or one partner, in the case of a partnership.

2. Note: The Department of Labor & Workforce Development, Construction EEO Monitoring Program will assign a contractor ID number to your company. This number will be your permanently assigned contractor ID number that must be on all correspondence and reports submitted to this office.

3. Enter the prime contractor’s name, address and zip code number.

4. Check box if Company is Minority Owned or Woman Owned

5. Enter the complete name and address of the Public Agency awarding the contract. Include the contract number, date of award and dollar amount of the contract.

6. Enter the name and address of the project, including the county in which the project is located.

7. Note: A project contract ID number will be assigned to your firm upon receipt of the completed Initial Project Workforce Report (AA201) for this contract. This number must be indicated on all correspondence and reports submitted to this office relating to this contract.

8. Check “Yes” or “No” to indicate whether a Project Labor Agreement (PLA) was established with the labor organization(s) for this project.

9. Under the Projected Total Number of Employees in each trade or craft and at each level of classification, enter the total composite workforce of the prime contractor and all subcontractors projected to work on the project. Under Projected Employees enter total minority and female employees of the prime contractor and all subcontractors projected to work on the project. Minority employees include Black, Hispanic, American Indian and Asian, (J=Journeyworker, AP=Apprentice). Include projected phase-in and completion dates.

10. Print or type the name of the company official or authorized Equal Employment Opportunity (EEO) official include signature and title, phone number and date the report is submitted.

This report must be submitted to the Public Agency that awards the contract and the Department of Labor & Workforce Development, Construction EEO Compliance Monitoring Program after notification of award, but prior signing the contract.

THE CONTRACTOR IS TO RETAIN A COPY AND SUBMIT COPY TO THE PUBLIC AGENCY AWARTING THE CONTRACT AND FORWARD A COPY TO:

NEW JERSEY DEPARTMENT OF LABOR & WORKFORCE DEVELOPMENT
CONSTRUCTION EEO COMPLIANCE MONITORING UNIT
P.O. BOX 209
TRENTON, NJ 08625-0209
(609) 292-9550
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This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.
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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. For a full enumeration of Contract Documents which include the Instructions to Bidders, the Advertisement and forms required at the time of and after the receipt of the bids. See Article 9 of the A101-2017 Standard Form of Agreement Between Owner and Contractor. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

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

§ 1.1.3 The Work

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

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services and shall include the Instructions to Bidders, the Advertisement and forms required at the time of and after the receipt of the bids.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.
§ 1.1.8 Initial Decision Maker
The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith. **The Architect shall be the Initial Decision Maker.**

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

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

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

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

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

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

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

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect’s consultants. **Drawings,**
specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service for use solely with respect to this Project, except that Owner shall be authorized to use any Instruments of Service for future additions or alterations to this Project or for other Projects. The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service and shall retain all common law, statutory and other reserved rights, including copyrights.

§ 1.5.3 The Contractor will be furnished free of charge two (2) sets of signed and sealed drawings and specifications. If more documents are required by the Contractor, the additional documents may be obtained at the cost of $2.00 per sheet and $100.00 per specification.

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

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

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

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

§ 1.9 EXECUTION OF CONTRACT DOCUMENTS
§ 1.9.1 Contract Documents requiring signature shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request. The Agreement shall be signed in not less than triplicate by the Owner and Contractor.

§ 1.9.2 Execution of the Contract by the Contractor is a representation that said Contract Documents are full and complete, are sufficient to have enabled the Contractor to determine the cost of the Work therein to enter into the Contract and that the Contract Documents are sufficient to enable it to construct the Work outlined therein, and otherwise to fulfill all its obligations hereunder, including, but not limited to, Contractor's obligation to construct the Work for an amount not in excess of the Contract Sum on or before the date(s) of Substantial Completion established in the Agreement. The Contractor further acknowledges and declares that it has visited and examined the site, examined all physical, legal, and other conditions affecting the Work and is fully familiar with all of the conditions thereon and thereunder affecting the same. In connection therewith, Contractor specifically
represents and warrants to Owner that it has, by careful examination, satisfied itself as to: (1) the nature, location and character of the Project and the site, including, without limitation, the surface and subsurface conditions of the site and all structures and obstructions thereon and thereunder, both natural and man-made, and all surface and subsurface water conditions of the site and the surrounding area; (2) the nature, location, and character of the general area in which the Project is located, including without limitation, its climatic conditions, available labor supply and labor costs, and available equipment supply and equipment costs; and (3) the quality and quantity of all materials, supplies, tools, equipment, labor, and professional services necessary to complete the Work in the manner and within the cost and time frame required by the Contract Documents. In connection with the foregoing, and having carefully examined all Contract Documents, as aforesaid, and having visited the site, the contractor acknowledges and declares that it has no knowledge of any discrepancies, omissions, ambiguities, or conflicts in said Contract Documents and that if it becomes aware of any such discrepancies, omissions, ambiguities, or conflicts, it will promptly notify Owner and Architect of such fact.

§ 1.9.3 The Contract Documents include all items necessary for the proper execution and completion of the Work by the Contractor. The Work shall consist of all items specifically included in the Contract Documents as well as all additional items of work which are reasonably inferable from that which is specified in order to complete the Work in accordance with the Contract Documents. The Contract Documents are complementary, and what is required by any one Contract Document shall be as binding as if required by all. Any differences between the requirements of the Drawings and the Specifications or any differences noted within the Drawings themselves or within the Specifications themselves have been referred to the Owner and Architect by Contractor prior to the submission of bids and have been clarified by an Addendum issued to all bidders.

If any such differences or conflicts were not called to the Owner's and Architect's attention prior to submission of bids, the Architect shall decide which of the conflicting requirements will govern based upon the most stringent of the requirements, and, subject to the approval of the Owner, the Contractor shall perform the Work at no additional cost and/or time to the Owner in accordance with the Architect's decision. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonable inferable therefrom as being necessary to produce the intended results.

1.9.3.1 The term "reasonably inferable" includes work necessary to "provide" work indicated or specified, as defined in section: Definitions and Standards; that is: furnish and install, complete, in place and ready for use.

1.9.3.2 Details referenced to portions of the Work shall apply to other like portions of the Work not otherwise detailed.

1.9.3.3 The Contractor shall submit a Request for Information “RFI” to the Architect/Engineer for interpretation of apparent discrepancies, conflicts, or omissions in the Specifications and Drawings. Subcontractors shall forward such requests through the Contractor. Such requests, and the Architect/Engineer's interpretation, shall be in written form; other forms of communications shall be used to expedite resolution of concerns, but will not be binding.

§1.9.4 Explanatory notes shall take precedence over conflicting drawn note indications. Large scale drawings shall take precedence over small scale drawings. Figured dimensions shall take precedence over scaled measurements. Should contradictions be found, the Architect shall determine which indication is correct.

§1.9.5 When more than one material, brand, or process is specified for a particular item of Work, the choice shall be the Contractor's. Contractor may, after notifying the Architect and Owner, select the one it considers to be the
§1.9.6 In all cases, the details, drawings, and specifications shall be checked with existing conditions and with work in place, and variations, if any, shall be referred by the Contractor to the Architect for adjustment, as the Contractor will be responsible for the fit or work in place.

§1.9.7 When a profile, section or other finished condition is shown, furring or other method of obtaining such finished conditions shall be provided. The drawings may show work fully drawn out or only a portion thereof, the remainder being in outline. The drawn-out portions apply to other like or similar places.

§1.9.8 Where it is required in the specifications that materials, products, processes, equipment, or the like be installed or applied in accordance with manufacturers' instructions, directions, or specifications, or words to this effect, it shall be construed to mean that said application or installation shall be in strict accordance with printed material concerned for use under conditions similar to those at the job site. Three copies of such instructions shall be furnished to the Architect and his written approval thereof obtained before work is begun.

§1.9.9 Any material specified by reference to the number, symbol, or title of a Commercial Standard, Federal Specification, ASTM Specification, trade association standard, or other similar standards, shall comply with the requirements in the latest revision thereof and any amendments or supplements thereto in effect one month prior to the date on which bids are opened and read, except as limited to type, class, or grade, or modified in such reference. The standards referred to, except as modified in the specifications, shall have full force and effect as though printed in the specifications. The Architect will furnish upon request information as to how copies of the standards referred to may be obtained.

ARTICLE 2 OWNER
§ 2.1 General
§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner’s approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term “Owner” means the Owner or the Owner’s authorized representative.

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

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

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

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

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

§ 2.3 Information and Services Required of the Owner

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

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

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

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. The furnishing of these surveys and the legal description of the site shall not relieve the Contractor from its duties under the Contract Documents. Neither Owner nor the Architect shall be required to furnish Contractor with any information concerning subsurface characteristics, utilities or conditions of the areas where the Work is to be performed. When the Owner or Architect has made investigations of subsurface characteristics or conditions of the areas where the Work is to be performed, such investigations, if any, were made solely for the purposes of Owner's study and Architect's design. Neither such investigations nor the records thereof are a part of the Contract between Owner and Contractor. To the extent such investigations or the records thereof are made available to Contractor by the Owner or Architect, such information is furnished solely for the convenience of Contractor. Neither Owner nor Architect assumes any responsibility whatsoever in respect of the sufficiency or accuracy of the investigations thus made, the records thereof, or of the interpretations set forth therein or made by the Owner or Architect in its use thereof, and there is no warranty or guaranty, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing.
throughout the areas where the Work is to be performed, or any part thereof, or that unforeseen developments may not occur, or that materials other than or in proportions different from those indicated may not be encountered. The Contractor shall undertake such further investigations and studies as may be necessary or useful to determine subsurface characteristics and conditions. In connection with the foregoing, Contractor shall be solely responsible for locating (and shall locate prior to performing Work) all utility lines, telephone company lines and cables, sewer lines, water pipes, gas lines, electrical lines, including, without limitation, all buried pipelines and buried telephone cables and shall perform the Work in such a manner so as to avoid damaging any such lines, cables, pipes, and pipelines.

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

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2 and 1.5.3.

§ 2.4 Owner’s Right to Stop the Work
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, or fails or refuses to provide a sufficient amount of properly supervised and coordinated labor, materials, or equipment so as to be able to complete the Work within the Contract Time or fails to remove and discharge (within ten days) any lien filed upon Owner’s property by anyone claiming by, through, or under Contractor, or disregards the instructions of Architect or Owner when based on the requirements of the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

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

§ 2.5.1 The Owner shall have the authority to immediately correct, service, repair, replace or otherwise make operational any component of their facilities including equipment if in the sole discretion of the owner the damaged component is a threat to education, safety or security. The Owner is obligated to put the Contractor on notice of the issue threatening education, safety or security, and their intent to remedy immediately with other resources and to backcharge the contractor for the cost of said service, but there are no notice provisions required for the corrective actions necessary to protect the Owner.
ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term “Contractor” means the Contractor or the Contractor’s authorized representative. The Term “Contractor” shall mean the respective Prime Contract person or entity identified as such in the Owner Contractor Agreement, for each respective Prime Construction Contract, as responsible for the supervisory control over allocation, coordination of all Subcontractors or trades, performance and completion of all portions of the Work, including cooperation with those doing portions of the Work under Separate Contract with the Owner.

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

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. In addition to and not in derogation of Contractor’s duties under Paragraphs 1.9.2 and 1.9.3, the Contractor shall carefully study and compare the Contract Documents with each other and shall at once report to the Architect errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner or Architect for damage resulting from errors, inconsistencies or omissions in the Contract Documents that could not have been discovered by a prudent and experienced contractor in advance and that are not in the nature of items described in and intended to be covered in Paragraphs 1.9.2 and 1.9., unless the Contractor recognized or reasonably should have recognized such error, inconsistency or omission and failed to report it to the Architect. If the Contractor performs any construction activity involving an error, inconsistency or omission in the Contract Documents that the Contractor recognized or reasonably should have recognized without such notice to the Architect, the Contractor shall assume complete responsibility for such performance and shall bear the full amount of the attributable costs for correction.

§ 3.2.2.1 If any errors, inconsistencies, or omissions in Contract Documents are recognized or reasonably should have been recognized by the Contractor, any member of its organization, or any of its Subcontractors, the Contractor shall be responsible for notifying the Architect in writing of such error, inconsistency, or omission before proceeding with the Work. The Architect will take such notice under advisement and within a reasonable
time commensurate with job progress render a decision. If Contractor fails to give such notice and proceeds with such Work, it shall correct any such errors, inconsistencies, or omissions at no additional cost to the Owner.

Deviations from the construction documents must be noted by the Contractor at the time of shop drawing submission. Failure to do so will result in the implication of the above Sections 3.2.2, 3.2.1, 3.2.2 and 3.2.2.1.

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

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

§ 3.3 Supervision and Construction Procedures

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

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

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

§ 3.3.4 The Contractor, when requested by the Architect, shall meet with representative of the Architect at all times and furnish all information requested; he shall allow the Architect to inspect the work at all times. Neither the Owner, nor the Architect shall be liable to the Contractor for extra compensation or damages for interference or delays on account of any such meetings, information, or inspections so requested or other acts of the Architect done in good faith and within the scope of their employment by the Owner. In addition, the Contractor is entrusted with the oversight, management control, and general direction of this project to ensure that all contract
completion dates are met. In the event that there are any delays caused to any subcontractor on this project, liability shall lie with the Contractor and not with the Owner.

§ 3.3.5 The Contractor has the responsibility to ensure that all material suppliers and Subcontractors, their agents, and employees adhere to the Contract Documents, and that they order materials on time, taking into account the current market and delivery conditions and that they provide materials on time. The Contractor shall coordinate its Work with that of all others on the Project including deliveries, storage, installations, and construction utilities. The Contractor shall be responsible for the space requirements, locations, and routing of its equipment. In areas and locations where the proper and most effective space requirements, locations and routing cannot be made as indicated, the Contractor shall meet with all others involved, before installation, to plan the most effective and efficient method of overall installation.

§ 3.3.6 The Contractor shall establish and maintain bench marks and all other grades, lines, and levels necessary for the Work, report errors or inconsistencies to the Architect before commencing Work and review the placement of the building(s) and permanent facilities on the site with the Owner and Architect after all lines are staked out and before foundation Work is started. Contractor shall provide access to the Work for the Owner, the Architect, other persons designated by Owner, and governmental inspectors. Any encroachments made by Contractor or its Subcontractor (of any tier) on adjacent properties due to construction as revealed by an improvement survey, except for encroachments arising from errors or omissions not reasonably discoverable by Contractor in the Contract Documents, shall be the sole responsibility of the Contractor, and Contractor shall correct such encroachments within thirty (30) days of the improvement survey (or as soon thereafter as reasonably possible), at Contractor's sole cost and expense, either by the removal of the encroachment (and subsequent reconstruction on the Project site) or agreement with the adjacent property owner(s) (in form and substance satisfactory to Owner in its sole discretion) allowing the encroachments to remain.

§ 3.3.7 Coordination:

1. The Lump Sum Single Prime Contractor “The Contractor” is the sole responsible party for the coordination of the entire project.

2. The Contractor shall be responsible to coordinate and expedite the total construction process and all of its parts. The Owner relies upon the organization, management, skill, cooperation and efficiency of the Contractor to supervise, direct, control and manage the work and to coordinate and expedite the efforts of the other prime contractors and subcontractors so as to deliver the work conforming to the contract within the scheduled time. The Contractor is responsible for proper sequence and coordination. It shall determine the location of work and resolve conflicts amongst Contractors.

3. The Contractor shall provide a qualified full-time staff member or members to manage the project. THIS PROJECT MANAGER shall coordinate, organize and manage the project from the contractor's main office and oversee the shop drawing process signing off for quality assurance and conformance with the Contract Documents on each shop drawing. The Project Manager shall be subject to the approval of the Owner, Construction Manager and Architect who at all times have the right to require the contractor to replace this Project Manager if they fail to perform. The Project Manager shall conduct an onsite meeting at least once a week with the construction superintendent and all other prime and/or subcontractors in attendance to coordinate the project and review the schedule. The Construction Manager will attend but is not responsible for organizing or taking minutes. The Project Manager shall provide a meeting agenda and issue minutes within four (4) working days of each meeting.
4. The Contractor shall provide a qualified full-time staff member or members to manage the project on site. THIS CONSTRUCTION SUPERINTENDENT shall coordinate, organize and manage the project from the contractor’s on-site field office and oversee their own work and the work of their sub-contractors. Should the prime contractor be responsible for multiple projects at different sites, or multiple locations on one large site, then the contractor shall provide a separate qualified superintendent for each of the projects or locations. This determination shall be made by and subject to the approval of the Owner, Construction Manager and Architect who at all times may require additional manpower. The superintendent shall be responsible for onsite safety, quality assurance, conformance with the Contract Documents and perform coordination with all on site construction personnel and/or subcontractors. The Construction superintendent shall be subject to the approval of the Owner, Construction Manager and Architect who at all times have the right to require the contractor to replace this Construction superintendent if they fail to perform.

5. The other subcontractors shall also have a designated superintendent and/or foreman who will at all times be subject to the approval of the Owner, Construction Manager and Architect. The Owner, Construction Manager and Architect reserves the right to require the contractor to replace the superintendent and/or foreman if, in the opinion of the Owner, Construction Manager and Architect, the superintendent and/or foreman is not performing satisfactorily.

6. Each prime subcontractor shall coordinate his activities with the activities of other contractors.

7. All questions pertaining to the work are to be made to the Architect sufficiently in (via an RFI Form) advance of construction to permit comparisons investigation or references to drawings and shop drawings as necessary.

8. The Contractor is required to submit a site logistics plan coordinating all Owner or Construction Manager functions with the access and safety of the job site.

9. The Contractor is required to coordinate all the inspection and material testing to meet the contract documents specifications.

10. The Contractor has full and sole responsibility for construction methods and implementation of a "quality control system" to insure coordination.

11. The Contractor is responsible for field verification of all dimensions/measurements for the coordination of materials and trades. Check field dimensions, clearances, relationships to available space, and anchors.

12. The Contractor shall make all necessary arrangements to conduct work so that all parts shall be carried on harmoniously and simultaneously or sequentially, so as components or increments of the same shall not interfere or retard the progress of others.

13. Minor changes in locations of equipment, parts, etc. due to field conditions shall be made, if so directed, at no additional cost.

14. The Contractor shall coordinate the delivery, unloading, movement, relocation, storage and protection of all materials.

15. The Contractor shall examine the drawings and dimensions and is responsible for satisfactory joining and fitting of all parts of the work.

16. Accurate dimensions, sleeved and opening drawings are to be submitted prior to placement in the field.

17. The Contractor shall prepare coordination drawings for all above ceiling areas throughout the entire project. Drawings showing all piping, duct, cable trays, electrical duct banks, and similar items, but not electrical conduit less than 4 inches in diameter. Complete architectural, mechanical and electrical reflected ceiling layouts, (including ductwork, conduits, piping, lighting, etc.).

18. The Contractor is responsible for any omissions of the subcontractors and is required to provide a complete operating facility.

19. The Contractor shall be responsible for preserving the integrity of ceiling heights and room sizes and shall:
a. Check compatibility with equipment, other work, electrical characteristics, and operational control requirements. Check motor voltages and control characteristics. Coordinate controls, interlocks, wiring of pneumatic switches, and relays. Coordinate wiring and control wiring diagrams. Review the effect of changes on other work. Obtain and distribute installation data on each item of equipment requiring mechanical or electrical connections;

b. Coordinate and observe start-up and demonstration of equipment and systems. Observe and maintain record of tests and inspections. Coordinate maintenance of record documents;

c. Assist the Consultant and Construction Manager with final inspections.

d. Inform the Owner via the Construction Manager when coordination of his work is required;

e. Coordinate all mechanical, plumbing, electrical, food service and equipment/furnishings work, and coordinate that work with all other work.

20. Where space is limited, coordinate arrangement of mechanical, electrical, and other work to fit, show plan and cross-section dimensions of space available, including structural obstructions and ceilings as applicable.

21. Coordinate cutting and patching activities and sequencing.

22. The Architect, Construction Manager and Owner shall assist in resolution of any coordination items.

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

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive and the provisions of Section 01300 of the Contract Specifications.

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

§ 3.4.4 The Contractor must provide suitable storage facilities at the site for the proper protection and safe storage of his materials. Such storage facilities must be approved in advance in writing by the Architect.

§ 3.4.5 All materials delivered to the premises which are to form a part of the work are to be considered the property of the Owner and must not be removed without the Architect’s consent; but the Contractor shall remove all surplus materials upon completion of each phase of the work and as directed by the Architect.

§ 3.4.6 When any room is used as a shop, storeroom, etc., during the progress of the work, the Contractor making use of the space will be responsible for any repairs, patching, or cleaning arising from such use. Prior approval of the Construction Manager or Architect for use of such areas is mandatory.
§ 3.4.7 Not later than seven (7) days from the Notice to Proceed, the Contractor shall provide a list showing the name of the manufacturer proposed to be used for each of the products identified in the Specifications Divisions 1-16, and if applicable, the installing Subcontractor’s name.

§ 3.4.8 The Contractor will be held to be thoroughly familiar with all conditions affecting labor in the locale of the Project, including, but not limited to, trade jurisdictions and agreements, incentive and premium time, pay, procurement, living and commuting conditions. Contractor shall assume responsibility for costs resulting from his failure to verify conditions affecting his labor. Prospective bidders are advised that the Project is subject to a Project Labor Agreement (PLA). The PLA will be binding upon all Contractors performing on-site Project work, as defined in Article 3 of the PLA. The PLA can be examined, and copies obtained at the office of the Construction Manager.

§ 3.4.9 Contractor shall be responsible for labor peace on the Project and shall at all times make its best efforts and judgment as an experienced contractor to adopt and implement policies and practices designed to avoid work stoppages, slowdowns, disputes, or strikes where reasonably possible and practical under the circumstances, and shall at all times maintain Project-wide labor harmony. Except as specifically provided in Subparagraph 8.3.1, Contractor shall be liable to Owner for all damages suffered by Owner occurring as a result of work stoppages, slowdowns, disputes, or strikes.

§ 3.5 Warranty

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

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

§ 3.5.2 The Contractor represents that all manufacturer and supplier warranties shall run directly to or be specifically assignable to the Owner. The Contractor warrants that all portions of the work that will be covered by a manufacturer’s or supplier’s warranty shall be performed in such a manner so as to preserve all rights under such warranties. The Contractor hereby assigns to the Owner effective upon the termination of this contract all manufacturer’s and supplier’s warranties relating to the Work, and the Contractor shall upon request of the Owner, execute any document reasonably requested by Owner to effectuate such assignment. If the Owner attempts to enforce a claim based upon a manufacturer’s or supplier’s warranty and such manufacturer or supplier refuses to honor such warranty based in whole or in part on a claim of defective installation by the Contractor, the Contractor shall be responsible for any resulting loss or damages incurred by the Owner as a result of the manufacturer’s or supplier’s refusal to honor such warranty. The Contractor’s obligations under this Subparagraph 3.5.2 shall survive the expiration or earlier termination of the Contract. The warranty period for all work of each Contractor shall be two (2) years from the date of final inspection and acceptance by the Owner unless otherwise specified.
§ 3.6 Taxes
The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.6.1 The owner is exempt from most taxes including Federal Excise Tax, fuel tax, transportation taxes and State Sales or Use Tax.

§ 3.7 Permits, Fees, Notices and Compliance with Laws
§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall be required to secure permits or government approvals necessary for the proper execution and completion of the work. The Contractor shall obtain business licenses required by the State, County and/or City/Township and shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the work.

3.7.1.1 The required Building Permit or Permits shall be secured by the Contractor for his trade; or by the Prime Contractor in charge of the Work when the Contract combines more than one trade under a Single Contract. This shall include permits required for the Construction Manager's Trailer.

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

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

§ 3.7.4 Concealed or Unknown Conditions
If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days three (3) days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

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

§ 3.8 Allowances (See Specification “Section 01210 – Allowances”)

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor’s costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor’s costs under Section 3.8.2.2.

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

§ 3.9 Superintendent

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

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

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

§ 3.9.4 A superintendent for the contractor shall be required for the overall project and a Foreman shall be required at each project site. The number of necessary Assistants to the superintendent shall be the areas where work is in progress shall be adequately supervised by the Contractor’s superintendent or one of his assistants. If, in the Construction Manager’s Architect’s or Engineer’s opinion, the quality or progress of the work are adversely affected by lack of adequate supervision, the Contractor shall be required to increase the number of foremen and/or assistants at no increase in the Contract sum.

§ 3.10 Contractor’s Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work. The schedule shall contain detailed information for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of
Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The schedule which is prepared by the Contractor shall indicate the proposed starting and completion date for the various subdivisions of the Work as well as the totality of the Work. The schedule shall be updated every thirty (30) days and must be submitted to the Architect with Contractor's Applications for Payment. If the schedule is not submitted with the payment application, no payment will be processed. Each schedule shall contain a comparison of actual progress with the estimated progress for such point in time started in the original schedule. If any schedule submitted sets forth a date for Substantial Completion for the Work or any phase of the Work beyond the Date(s) of Substantial Completion established in the Contract (as the same may be extended as provided in the Contract Documents), then Contractor shall submit to Architect and Owner for their review and approval a description of the means and methods which Contractor intends to employ to expedite the progress of the Work to ensure timely completion of the various phases of the Work as well as the totality of the Work. To ensure such timely completion, Contractor shall take all necessary action including, without limitation, increasing the number of personnel and labor on the Project and implementing overtime and double shifts. In that event, Contractor shall not be entitled to an adjustment in the Contract Sum or the schedule.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect’s approval. The Architect’s approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor’s construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

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

§ 3.10.4 Schedules shall comply with the requirements of the Division 1 “Section 01040 - Project Coordination,” Section 01310, “Construction Progress Documentation.” And Section 01315, “CPM Schedule.”

§ 3.11 Documents and Samples at the Site
The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed. See Specification “Section 01300 - Submittals,” and “Section 01700 - Project Closeout,” for specific details and requirements.

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

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

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

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

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

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

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

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

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

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

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

§ 3.12.11 Detailed requirements are specified in Specification "Section 01300 - Submittals."

§ 3.12.12 All shop drawings are to include manufacturer's data. All shop drawings and samples are to be submitted by the Contractor to the Architect for review. Each sheet of the shop drawings shall identify the project, contractor, subcontractor, and fabricator or manufacturer and the date of the drawings. All shop drawings shall be numbered in consecutive sequence and each sheet shall indicate the total number of sheets in the set.

§ 3.12.13 Substitutions: All substitutions or deviations from plans and specification must be clearly noted as such on all shop drawings. Contractor shall identify, coordinate and pay for any additional requirements as a result of substitutions, deviations, etc., including necessary change orders. In addition, substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products.

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

§ 3.13.1 Location and weights of all equipment and materials and the Contractor intends to place on the slab shall be submitted to the Architect for review.

§ 3.13.2 Only materials and equipment which are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractor.

§ 3.13.3 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner.

§ 3.13.4 Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building materials and equipment likely to cause hazardous conditions. Without limitation of any provision of the Contract Documents, Contractor shall use its best efforts to minimize
any interference with the occupancy or beneficial use of (1) any areas and buildings adjacent to the site of the Work or (2) the Building in the event of partial occupancy, as more specifically described in Paragraph 9.9.

§ 3.13.5 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including without limitation, lavatories, toilets, entrances and parking areas other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building, as amended from time to time.

The Contractor shall immediately notify the Owner in writing if during the performance of the Work, the Contractor finds compliance with any portion of such rules and regulations to be impracticable, setting forth the problems of such and suggest alternatives through which the same results can be achieved. The Owner may, in the Owner’s sole discretion, adopt such suggestions, develop new alternatives or require compliance with the existing requirement of the rules and regulations. The Contractor shall also comply with all insurance requirements and collective bargaining agreements applicable to use and occupancy of the Project site and the Building.

§ 3.13.6 The Contractor shall provide a temporary construction fence whether shown on the contract documents or not as required to separate the area or areas under construction from the Owners area or areas used by the public. The temporary fencing shall be approved by the Owner prior to installation. The fence shall be 6’ high and have vinyl privacy fabric obstructing views into the construction area.

§ 3.14 Cutting and Patching (See Specification “Section 01045 – Cutting and Patching”)
§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

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

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

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

§ 3.15.3 The Contractor shall perform all daily clean up and removal of debris from the site including that of his subcontractors. The Contractor shall maintain an adequate supply of laborers to accomplish daily clean up and removal of debris from the site and work areas. No debris will be allowed to accumulate in or around the building including masonry debris. The building site must be maintained free of all litter, dirt, dust and debris on a daily basis. The Owner, Construction Manager, and/or Architect may stop all work and require all personnel
on site to clean up. No accumulation of flammable material is permitted. Prior to installation of finishes the floors will be swept or vacuumed and kept free of dust and dirt until turned over to the Owner.

§ 3.15.4 Cleaning and debris removal may be considered a safety concern by judgment of the Owner or his agents and as such the work may be stopped to provide time and labor for immediate clean up.

§ 3.15.5 Final Clean-Up: The Contractor has the responsibility for the final clean-up and policing of the entire site after other contractors have removed their own waste materials, rubbish, equipment, tools and plant. In addition, thereto, the General Construction Contractor shall have a professional cleaning company perform the following immediately prior to the Architect's inspection for Substantial Completion:

.1 Removal of all manufacturer's temporary labels from materials, equipment and fixtures.
.2 Removal of all stains from glass and mirrors; wash, polish, inside and outside.
.3 Removal of marks, stains, finger prints, other soil, dust, dirt, from painted, decorated, or stained woodwork, plaster or plasterboard, metal, acoustic tile, and equipment surfaces.
.4 Remove spots, paint, soil, from resilient flooring.
.5 Remove temporary floor protections; clean, strip and provide three (3) coats of wax on new VCT floors or otherwise treat as directed by the material manufacturers recommendation, all finished floors. Final vacuum all carpet.
.6 Clean all interior finished surfaces, including doors and window frames, and hardware required to have a polished finish, of oil, stains, dust, dirt, paint, and the like; leave without finger prints, blemishes.
.7 Final site clean-up shall extend beyond the Contract Limit Lines as reasonably required to insure the complete removal of all construction debris from the entire site, including staging areas.

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

§ 3.16.1 The Contractor shall promptly notify the Architect/Engineer and Owner of the presence of hazardous conditions at the site, including the start of hazardous operations or the discovery or exposure of hazardous substances.

§ 3.16.2 Contractor shall be responsible for snow plowing and snow removal as required to maintain access/egress to construction area.

§ 3.16.3 Contractor shall keep only necessary equipment on site and shall cooperate with the Owner regarding location of stored material.

§ 3.16.4 The Contractor is to maintain reasonable access to site for structural steel erection including crane, steel deliveries, etc. The Contractor will be responsible to coordinate requirements with the Construction Manager a minimum of 21 days prior to deliveries.

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

§ 3.18 Indemnification

§3.18.1 Contractor, for itself, its successors and assigns, agrees to defend, indemnify and save Owner, its successors, assigns, employees, agents, construction managers, architects and engineers, harmless from, and against any and all claims, demands, damages, actions or causes of action, together with any and all losses, costs or expenses in connection therewith or related thereto, including but not limited to attorney fees and costs of suit, for bodily injuries, death including bodily injury or death to an employee or subcontractor of Contractor for property damage arising in or in any manner growing out of the work performed, or to be performed under this Contract but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18. Contractor, of itself, its successors and assigns, agrees to defend. Indemnify and hold the Owner, its successors, assigns, employees, agents, construction managers, architects, and engineers harmless against all fines, penalties or losses incurred for, including but not limited to attorney fees and costs of suit, or by reason of the violation by Contractor in the performance of this Contract, of any ordinance, regulation, rule of law of any political subdivision or duly constituted public authority.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement. The term "Architect" means the Architect or the Architect's authorized representative.

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

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect whose status under the Contract Documents shall be that of the Architect.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect and Construction Manager will provide administration of the Contract as described in the Contract Documents, and will be the Owner's representatives (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the two-year period for correction of Work described in Paragraph 12.2. The Architect and Construction Manager will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract. The Owner has hired a Construction Manager to provide onsite Project Management services. The Construction Manager will be the Owner's Representative for this Project. The Construction Manager and the Architect will share administration duties, which will be delineated
at the Pre-construction meeting. The Construction Manager will essentially be the single point of contact, defer to the Contractors for means and methods and will defer to the Architect for final clarifications and determinations of disputes, design issues, and aesthetics.

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

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

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

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

§ 4.2.6 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.1, 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

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

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

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

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

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

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

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

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

§ 4.2.15 The Owner has hired A Construction Manager to provide on-site Project Management services. Construction Manager will be the Owner's Representative/Agent for this Project. Construction Manager and the Architect will share administrative duties, which will be delineated at the Pre-construction conference. The Construction Manager will essentially be the single point of contact, defer to the Contractor for means and methods and will defer to the Architect for final clarifications and determinations of disputes, design issues, and aesthetics. The Construction Manager, along with the Architect, will manage the following processes - shop drawings, change orders, payments, correspondence, RFI's, construction schedules, documentation, job meetings, quality assurance, punchlists, etc.
ARTICLE 5  SUBCONTRACTORS
§ 5.1 Definitions
§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

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

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work
§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14 day period shall constitute notice of no reasonable objection. The names of all subcontractors and material suppliers shall be submitted to the Architect for approval not later than seven (7) days after the date of the notice to proceed. The list of proposed subcontractors shall include a description of the materials and equipment each proposes to furnish and install in the work. The description shall be in sufficient detail to allow the Architect to determine general conformance to Contract requirements. Approval of the submittals required under the Article shall not relieve the Contractor from conformance to the Contract Requirements.

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

§ 5.2.2.1 The Architect will promptly reply in writing to the Contractor stating whether the Owner or Architect, after due investigation, has reasonable objection to any such proposal. If adequate data on any proposed manufacturer or installer is not available, the Architect may state that action will be deferred until the Contractor provides further data. Failure of the Owner or Architect to reply promptly shall not constitute a waiver of any of the requirements of theContract Documents, and all products furnished by the listed manufacturer must conform to such requirements.

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

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

§ 5.3.1 The Contractor shall obligate each subcontractor specifically to comply with the New Law Against Discrimination N.J.S.A. 10:5-31 and N.J.A.C. 17:27 et seq. to avoid discriminatory practice in employment.

§ 5.3.2 The Contractor shall obligate each subcontractor to comply with the applicable prevailing wage schedule of the New Jersey Department of Labor and Workforce Development.

§ 5.3.3 The Contractor shall obligate each Sub-Contractor to comply with the Public Works Contractor Registration Act, N.J.S.A. 34:11-56.48 et seq.

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

1. assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

2. assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

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

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor’s obligations under the subcontract.
ARTICLE 6  CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
§ 6.1 Owner’s Right to Perform Construction and to Award Separate Contracts
§ 6.1.1 The term “Separate Contractor(s)” shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

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

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner’s own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL WORK. All trades have a mutual obligation to coordinate their work with the other trades and cooperate as necessary with the Contractor, Construction Manager and the Construction schedule – to complete the work as required by the Owner. The Construction Manager will provide assistance to the Contractor for coordination between their work and the Owner. The Contractor is required to have their superintendent or foreman on site at all times when their work or that of their subs is in progress

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

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

§ 6.2.2 If part of the Contractor’s Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect and Construction Manager of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor’s Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner’s or Separate Contractor’s completed or partially completed construction is fit and proper to receive the Contractor’s Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent. Should the Contractor be damaged by any other separate Contractor on the work by reason of such other Contractor’s failure to perform properly his Contract with the Owner, no action will lie against the Owner and the Owner shall have no liability therefor, but the Contractor may assert his claim for damage against such separate Contractor as a third party beneficiary under the Contract between such other Contractor and the Owner.
§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor’s delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor’s delays, improperly timed activities, damage to the Work or defective construction.

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

6.2.4.1 Should the Contractor cause damage to the work or property of any separate Contractor on the Project, the Contractor shall, upon due notice, settle with such other Contractor by agreement or Court of Law if he will so settle. If such separate Contractor sues the Owner, or the Architect or initiates a Court of Law proceeding on account of any damage alleged to have been so sustained, the Contractor agrees that he will hold the Owner or Architects harmless against any such suit, and that he will reimburse to the Owner or Architect, as the case may be, the cost of defending such suit, including reasonable attorney’s fee and if judgment against Owner or Architect arises therefrom, the Contractor shall pay all judgment cost incurred by the Owner or Architect.

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

§ 6.3 Owner’s Right to Clean Up
If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible as the Owner determines to be just, based on the recommendation of the Architect.

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

7.1.1.1 A field directive or field order shall not be recognized as having any impact upon the Contract Sum or the Contract Time and the Contractor shall have no claim therefor unless it shall, prior to complying with same and in no event no later than five (5) working days from the date such direction or order was given, submit to the Construction Manager its change proposal for the Owner's approval.

7.1.1.2 When submitting its change proposal, the Contractor shall include and set forth in clear and precise detail breakdowns of labor and materials for all trades involved and the estimated impact on the construction schedule including a specific number of days for a time extension. If the Change Order Request does not provide an additional time request, the Contractor shall not be entitled to an extension of time. The Contractor shall furnish spread sheets from which the breakdowns were prepared, plus spread sheets if requested of any Subcontractors. The Contractor may not claim additional time at a later date and shall remove any language to that effect from his/her Change Order Request.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Owner.
Contractor. An order for a minor change in the Work may be issued by the Architect alone in accordance with Paragraph 7.4.

§ 7.1.2.1 Neither this Contract nor the Work to be performed hereunder can be changed by oral agreement. No course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work and no claims that the Owner has been unjustly enriched by any alteration or addition to the Work, whether there is, in fact, any unjust enrichment to the Work, shall be the basis for any alleged implied agreement by the Owner to the change, any alleged waiver of the Owner's right under this Contract or any increase in any amounts due under the Contract or any or a change in any time period provided for in the Contract Documents.

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

§ 7.1.4 A directive or order from the Owner or the Architect, other than a Change Order, a Construction Change Directive or any Order for a minor change pursuant to this Article 7, shall not be recognized as having any impact on the Contract Sum or the Contract Time and the Contractor shall have no claim therefore. If the Contractor believes that a directive or order would require it to perform work not required by the Contract Documents, the Contractor shall so inform the Owner and Architect in writing prior to complying with the same and in no event, any later than five (5) working days from the day such direction or order was given, and shall submit to the Owner and Architect for the Owner's and Architect's approval its change proposal.

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

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

§ 7.2.2 Methods used in determining adjustments to the Contract Sum include those listed in Subparagraph 7.3.4. The total for overhead and profit shall NOT exceed 15%.

§ 7.2.3 Any change in work authorized in writing by the Owner and Architect that will require a change in the cost of the work, whether an additive or deductive change in cost, shall show a complete cost breakdown of labor, material, appropriate overhead and profit (15% maximum) and contract time.

§ 7.2.4 When a Change Order involves both additions and deletions in material, the net quantity is to be determined and the 15% overhead and profit is to be applied to the net quantity.

§ 7.2.5 When any change in the Work, regardless of the reason therefor, requires or is alleged to require an adjustment in Contract Time, such request for time adjustment shall be submitted by the Contractor as part of the change proposal. Any Change Order approved by the Owner and for which payment is accepted by the Contractor, in which no adjustment in Contract Time is stipulated, shall be understood to mean that no such adjustment is required by reason of the change, and any and all rights of the Contractor or any subsequent request for adjustment of Contract Time by reason of the change is waived.

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§7.2.6 Request by the Contractor for adjustment of the Contract Amount regardless of the reason therefor, shall be submitted to the Architect and the Owner with itemized labor and material quantities and unit prices to permit proper evaluation of the request. A submission by the Contractor containing unsubstantiated lump sum requests for adjustment of the Contract Amount will not be considered by the Owner and Architect. The Owner and Architect will not be liable for any delay incurred by reason of the Contractor’s failure to submit satisfactory justification and back-up with any request for adjustment to the Contract Amount.

§7.2.7 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the initial Work which is the subject to the Change Order, including, but not limited to, all direct, indirect and impact costs associated with such change and any and all adjustment to the Contract Sum and the Construction Schedule. The Contractor will not be entitled to any compensation for additional work, impact costs or delays in the Construction Schedule not included in the Change Order.

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

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

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

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

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement not to exceed 15%, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor shall be in accordance with the New Jersey Prevailing Wage Rates at the time of the Contract commencement with no additional “labor burden”, future increases or any other considerations, including applicable payroll taxes, fringe benefits required by agreement or custom, workers’ compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, only when machinery or equipment is not already on site whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance shall be limited to 1.5%, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change ARE NOT PERMITTED!

§ 7.3.4.1 The allowance for overhead and profit combined, included in the total cost to the Owner, may only include a Contractor, his Subcontractor and shall be limited to a total of 15% of the cost.

§ 7.3.4.2 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs, including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are subcontractors, they shall be itemized.

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

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

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

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

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

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

§ 7.4 Minor Changes in the Work
The Architect and/or the Construction Manager may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect’s and/or the Construction Manager’s order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect/Construction Manager within five (5) calendar days and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect’s and/or Construction Manager’s order for a minor change without prior notice to the Architect/Construction Manager that
such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

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

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement. The work to be performed under this Contract shall commence after the required insurance has been obtained and approved and within three days after issuance of the notice to proceed by the Owner. The Contract Time shall commence as of the date of the Notice to Proceed unless otherwise specified in the agreement.

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

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

§ 8.2 Progress and Completion

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

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

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

§ 8.2.4 Owner, or his/her representative, in coordination with the Contractor, shall set work hours. Contractor may be required to work nights, weekends or holidays as necessary to complete the work in accordance with the Schedule or in coordination with Owner's Activities. Under no circumstances shall the Contractor begin or continue with work that is adversely impacting Owner's activity or operations. All utility shutdowns, interruptions, work in or adjacent to existing buildings will be coordinated through the Owner, or his representative, and may have to be performed during hours when the Owner is not in operation. All cutting, hammering or other activity that is noisy, produces smoke or fumes or is otherwise disruptive to the Building may have to be done during hours when the Owner is not in operation. Work required to be performed after normal operating hours, as determined by the Owner or his representative, will be performed at no additional cost to the Owner.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; or by occurrences beyond the control and without the fault or negligence of the Contractor and which by the exercise of reasonable diligence the Contractor is unable to prevent or provide against, including labor disputes (other than disputes limited to the work force of, or provided by, the Contractor or its Subcontractors), fire, unusual delay in deliveries not reasonably anticipatable, unavoidable casualties, or by other occurrences which the Architect, subject to the Owner's approval, determines may justify delay, then, provided that the Contractor is in compliance with Subparagraph 8.3.3 hereof, the Contract Time shall be extended by Change Order or Construction Change Directive for the length of time actually and directly caused by such occurrence as
determined by the Architect and approved by the Contractor and Owner (such approval not to be unreasonably withheld, delayed, or conditioned); provided, however, that such extension of Contract Time shall be net of any delays caused by or due to the fault or negligence of the Contractor or which are otherwise the responsibility of the Contractor and shall also be net of any contingency or "float" time allowance included in the Contractor's construction schedule. The Contractor shall, in the event of any occurrence likely to cause a delay, cooperate in good faith with the Architect and Owner to minimize and mitigate the impact of any such occurrence and do all things reasonable under the circumstances to achieve this goal (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15. Any claim for extension of time shall be made in writing to the Architect not more than five (5) days after the commencement of the delay, otherwise, it shall be waived. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the work. No claim made beyond the five (5) days shall be considered valid.

§ 8.3.2.1 The Contractor agrees that if any delay in the Contractor's works unnecessarily delays the work of any other Contractor or Contractors, the Contractor shall in that case pay all costs and expenses incurred by such parties due to such delays and hereby authorizes the Owner to deduct the amount of such costs and expenses from any monies due or to become due the Contractor under this Contract. The Architect shall be responsible for ascertaining whether the Contractor is responsible for delaying any of the work of any other Contractor. His decision shall be final.

§ 8.3.3 Notwithstanding anything to the contrary in the Contract Documents, any extension of the Contract Time, to the extent permitted under Paragraph 8.3.1., shall be the sole remedy of the Contractor for any (1) delay in the commencement, prosecution or completion of the Work, (2) hindrance or obstruction in the performance of the Work, (3) loss of productivity or (4) other similar claims (collectively referred to in this Paragraph 8.3.3 as "delays"), whether or not such delays are foreseeable, unless a delay is caused by acts of the Owner constituting active interference with the Contractor's performance of the Work and only to the extent such acts continue after the Contractor furnishes the Owner with written notice of such interference. In no event shall the Contractor be entitled to any compensation or recovery of any damages in connection with any delay including without limitation consequential damages, lost opportunity cost, impact damages or other similar remuneration. The Owner's exercise of any of its rights or remedies under the Contract Documents (including without limitation ordering changes in the Work or directing suspension, rescheduling or correction of the Work) regardless of the extent or frequency of the Owner's exercise of such rights or remedies shall not be construed as an act of interference with the Contractor's performance of the Work. This Section 8.3 does not preclude recovery of damages for delay by either party the Owner under other provisions of the Contract Documents.

§ 8.3.4 The Contractor agrees that the Owner can deduct from the Contract Sum, any wages paid by the Owner to any Inspector or Architect or other professional necessarily employed by the Owner for any number of days in excess of the number of days allowed in the specifications for completion of work.

§ 8.3.5 Where the cause of delay is due to weather conditions, an extension of time shall be granted if such Claim has been documented by data substantiating that weather conditions were unusually severe for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction as determined by reference to historical data. The term "historical data" as used in the previous sentence shall be construed according to this formula: Average rainfall (or snow or low temperature) for the past five years.
ARTICLE 9 PAYMENTS AND COMPLETION

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

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

§ 9.1.3 Payment procedures shall be as follows:

1. Contractor shall submit Schedule of Values to the Construction Manager and Architect for review
2. Prior to end of each pay period, Contractor shall submit a rough draft ("pencil copy") for their payment application for review and approval by the Construction Manager and the Architect.
3. Upon approval of pencil copy, Contractor shall submit at least four copies of their payment application to the Architect for approval along with their certified payrolls and monthly manning reports.
4. Architect and Construction Manager will approve payments and forward to the Owner.

§ 9.2 Schedule of Values
Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work which in the aggregate equals that total Contract Sum, divided so as to facilitate payments to Subcontractors, supported by such evidence of correctness as the Architect may direct or as required by the Owner. It will be necessary for all Contractors to divide their contract into a separate schedule for the work performed at the project. These schedules, when approved by the Architect, Construction Manager and Owner, shall be used to monitor the progress of the Work and as a basis for Certificates for Payment. All items with entered values will be transferred by the Contractor to the "Applications and Certificate for Payment," and shall include the latest approved Change Orders and Construction Change Directives. Change Order values and Construction Change Directive values shall be broken down to show the various subcontractors. The Application for Payment shall be on AIA Document G702 and G703 and the approved Voucher obtainable from the Owner. Each item shall show its total scheduled value, value of previous applications, value of the application, percentage completed, value completed and value yet to be completed. All blanks and columns must be filled in, including every percentage complete figure. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.2.2 The Contractor shall include the following separate items in his/her schedule of values:

Punch List Work - Minimum of 1% of contract value  
Value for testing  
Value for Record Drawings and manuals  
Value for final clean-up and monthly value for daily clean up by the Contractor  
Value for equipment start-up and commissioning  
Value for shop drawings  
Value for Owner's attic stock  
Safety protections
§ 9.3 Applications for Payment

§ 9.3.1 The Contractor shall submit to the Architect an itemized Application for Payment for their Contract on AIA Document G702 and G703 and the approved Voucher obtainable from the Owner. Payroll Certification for all employees of all of the workers on the project shall be submitted as well as other such data for the purposes of summarizing the work and tracking the project. The Architect and the Construction Manager will process the application and forward it with his recommendations to the Owner. At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor’s right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

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

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

§ 9.3.1.3 Until substantial completion, the Owner will pay 98% of the amount due the Contractor on account of progress payments until a balance of $500,000 is due the Contractor. The retainage will then be increased to Five Percent (5%) of the $500,000 balance of the contract until final completion. The retainage will be held until final acceptance of the project by the Architect and the Owner. The Contractor shall submit a separate voucher for the full amount of the retainage along with the Consent of Surety, A.I.A. Form G707A and the Contractor shall be required to furnish a Maintenance Bond for 100% of the Project Cost for a period of two (2) years from the Date of Final Acceptance.

§ 9.3.1.4 Upon acceptance of the work performed pursuant to this Contract for which the Contractor has agreed to the withholding of payments pursuant to Article 9 of this Contract, all amounts being withheld by the Owner shall be paid in accordance with Paragraph 9.3.1.3 without further withholding of any amounts for any purposes whatsoever, provided that the Contract has been satisfactorily completed.

§ 9.3.1.5 Each application for payment shall be accompanied by the following, all in form and substance satisfactory to the Owner and Architect:

1. A current contractor’s lien waiver and duly executed and acknowledged sworn statement by an officer of the Contractor showing all subcontractors and materialmen with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any subcontractor and materialmen in the requested progress payment and the amount to be paid to the Contractor from such progress payment.
2. A Purchase Order or Voucher if required by the Owner.
3. A Schedule Update approved by the Construction Manager and Architect.
5. An updated Shop Drawing Log showing the status of all of the required Shop Drawings.
§ 9.3.2 Unless otherwise provided in the Contract Documents, At the Owner’s Option, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures Paragraphs 9.3.2.1, 9.3.2.2, 9.3.2.3 and 9.3.2.4 and satisfactory to the Owner to establish the Owner’s title to such materials and equipment or otherwise protect the Owner’s interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.2.1 With each Application for Payment the Contractor shall submit to the Architect and Owner a written list identifying each location where materials are stored off the Project site and the value of materials at each location. The Contractor shall procure insurance satisfactory to the Owner for materials stored off the Project site in an amount not less than the total value thereof.

§ 9.3.2.2 The consent of any surety shall be obtained to the extent required prior to the payment for any materials stored off the Project site.

§ 9.3.2.3 Representatives of the Owner shall have the right to make inspections of the off-site storage areas at any time.

§ 9.3.2.4 Materials stored off site shall be protected from diversion, destruction, theft and damage to the satisfaction of the Owner, shall specifically be marked for use on the Project and shall be segregated from other materials at the storage facility.

§ 9.3.3 The Contractor warrants and agrees that title to all Work will pass to the Owner either by incorporation in the construction or upon receipt of payment therefor by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests, or encumbrances whatsoever, that the vesting of such title shall not impose any obligation on Owner or relieve Contractor of any of its obligations under the Contract, that the Contractor shall remain responsible for damages to or loss of the Work, whether completed or under construction, until responsibility for the Work has been accepted by Owner in the manner set forth in the Contract Documents, and that no Work covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person. The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor’s knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment
§ 9.4.1 The Architect will, within seven Fourteen days after receipt of the Contractor’s Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect’s reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect’s reason for withholding certification in whole as provided in
Section 9.5.1. The Architect must receive this information in accordance with the schedule set forth at the Pre-Construction Meeting.

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

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect’s opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of:

1. defective Work not remedied;
2. third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
3. failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
4. reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
5. damage to the Owner or a Separate Contractor;
6. reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
7. repeated failure to carry out the Work in accordance with the Contract Documents.
8. The failure of the Contractor to comply with mandatory requirements for maintaining record drawings. The Contractor shall be required to check record drawings each month. Written confirmation that the record drawings are up-to-date shall be required by the Architect before approval of the Contractor's monthly payment requisition will be considered.
9. The Contractor shall provide a third-party Insurance Safety Site Inspection Report monthly and remedy all issues promptly.
10. Shop drawings not submitted as required by the Contract Documents.
11. Failure to cooperate with Owner, Construction Manager or Architect relative to construction schedule, material storage, coordination with the Owner, clean up or safety.
§ 9.6.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

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

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

§ 9.6 Progress Payments
§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect. Notwithstanding Certification by the Architect, the Owner may refuse to make payment based on any default by the Contractor including, but not limited to those defaults set forth in Subparagraphs 9.5.1 through 9.5.1.11. The Owner shall not be deemed in default by reason of withholding payment while any of such defaults by the Contractor remain uncured.

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

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

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

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

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

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, Payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor. create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.
§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney’s fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.6.9 The Owner will issue timely payments to the Contractor in accordance with the requirements of “The Prompt Payment Act”, N.J.S.A. 2A:30A-1, et seq. The Contractor is hereby notified that the Owner, as a public entity, requires all payments to be approved at scheduled public Board of Trustees meetings. The vote on authorization for payments will be made at the first public meeting of the Board, following the Board’s receipt of the Architect’s authorization for payment, and paid during the subsequent payment cycle. The time schedule will be established at the Pre-Construction Meeting and subsequent project meetings.

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

§ 9.8 Substantial Completion
§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof which the Owner agrees to accept separately is sufficiently complete in accordance with this definition and the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The Work will not be considered substantially complete until all project systems included in the Work are operational as designed and scheduled, all designated or required inspections, certifications, permits, approvals, licenses and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial use and occupancy of the Project are received, designated instruction of Owner’s personnel has been completed, and all final finishes within the Contract are in place. In general, the only remaining Work shall be minor in nature, so that the Owner can occupy the building on that date and the completion of the Work by the Contractor would not materially interfere or hamper the Owner’s (or those claiming by, through or under the Owner) normal operations. Contractor recognizes that normal operations requires the use and occupancy of the Work by students and faculty without interruption and that any punchlist or corrective work shall be done at times when the Work is not so occupied. As a further condition of substantial completion acceptance, the Contractor shall certify that all remaining Work will be completed within thirty (30) consecutive calendar days or as agreed upon following the date of substantial completion. In addition to any other definitions of Substantial Completion as defined by the contract documents, the following is required before the project is considered “Substantially Complete”:

In addition to the above the following items must be completed in order to deem the work Substantially Complete:
1. All required final inspections have been completed by the authority having jurisdiction resulting in a TCO or CO.
2. Air Balancing Reports: Reports can be hand written field notes but must be reviewed and approved via the shop drawing process by the Mechanical Engineer. Final Air and Water Balancing Reports certified by the licensed balancer are required for “Final Acceptance” and the start of the warranty period.
(These reports must be submitted in accordance with the shop drawing process to Garrison Architects so that they can be tracked and approved and distributed to all applicable parties).

3. Equipment Start Up Reports: Reports can be hand written field notes but must be reviewed and approved via the shop drawing process by the Mechanical Engineer. (These reports must be submitted in accordance with the shop drawing process to Garrison Architects so that they can be tracked and approved and distributed to all applicable parties).

4. Owner On-site ATC Training: Refer to the ATC specifications for training requirements on-site and off-site. The Owner does not have beneficial use of the mechanical system until they can operate it following this training.

5. Completion of Commissioning: Refer to the Start-up and Adjustment specifications. This process will require the Owner’s Operator, Construction Manager and the Mechanical Engineer on site to witness a demonstration and operation of every mechanical device. The devices shall be operated from the on-site Owner’s ATC Computer and verified by the Mechanical Contractor’s field personnel to confirm proper operation. In addition to this demonstration, the contractor shall demonstrate Owner required maintenance of all mechanical equipment to maintain the manufacturer’s warranty. This should include but not be limited to belt tension/adjustments, filters, etc. Please schedule several days for the commissioning process.

6. Written certification from a qualified, AHC (Certified Architectural Hardware Consultant) that the hardware, cores and keying has been installed and tested in every door and is 100% complete for each phase or the total project whichever comes first.


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

§ 9.8.2.1 The Contractor shall perform a Quality Control / Quality Assurance QC/QA Punchlist of all work prior to requesting Substantial Completion and a punch list from the Construction Manager. The Contractor’s Project Manager shall take the lead and conduct an onsite review with the Contractor’s superintendent and representation from the Contractor’s subcontractors. Notification of this onsite walk thru shall be provided in writing to all members of the Owners Team who may or may not choose to attend. The Contractor’s Project Manager shall record and distribute this QC/QA Punchlist in a matrix that provides an additional column for the Contractor to document the completion of the work and the date. After successful completion of the Contractor’s QC/QA Punchlist and all work, the Contractor shall request the Construction Manager perform a Punchlist. Substantial Completion shall be requested in accordance with paragraph 9.8.1.

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

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

§ 9.8.4.1 The Architect's Certificate of Substantial Completion shall be subject to the Owner's final approval.

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

§ 9.9 Partial Occupancy or Use

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

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

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

§ 9.9.4 The occupancy of any portion of the Work shall not constitute acceptance of any Work, except as hereinafter stated, nor does it waive the Owner's right to Liquidated Damages. Final Acceptance of the Work shall be for the whole Work only and not part.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. All warranties and guarantees required pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Owner as part of the final application for payment. The final Certificate for Payment will not be issued by the Architect until all warranties and guarantees have been received and accepted by the Owner.
§ 9.10.1.1 The Architect's Certificate of Final Completion shall be subject to the Owner's final approval.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) evidence of compliance with all requirements of the Contract Documents: notices, certificates, affidavits, other requirements to complete obligations under the Contract Documents: including but not limited to (a) instruction of Owner's representatives in the operation of mechanical, electrical, plumbing and other systems, (b) delivery of keys to Owner with keying schedule: master, sub-master and special keys, (c) delivery to Architect of Contractor's General Warranty (as described in Paragraph 3.5) and each written warranty and assignment thereof prepared in duplicate, certificates of inspections, and bonds for Architect's review and delivery to Owner, (d) delivery to Architect a printed or typewritten operating, servicing, maintenance and cleaning instructions for all Work; parts lists and special tools for mechanical and electrical Work, in approval form, (e) delivery to the Architect of specified Project record documents and (f) delivery to Owner of a Final Waiver of Liens (AIA Document G-706 or other form satisfactory to Owner), covering all Work including that of all Subcontractors, vendors, labor, materials and services, executed by an authorized officer and duly notarized. In addition to the foregoing, all other submissions required by other articles and paragraphs of the Specifications including final construction schedule shall be submitted to the Architect before approval of final payment. If required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

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

§ 9.10.4 The making of final payment shall not constitute a waiver of Claims by the Owner, except those arising from:

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

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

9.11 LIQUIDATED DAMAGES

§ 9.11.1 The Contractor understands and agrees that all work must be performed in an orderly and closely coordinated sequence so that the date for substantial completion is met.

§ 9.11.2 If the Contractor fails to complete his work or fails to complete a portion of his work, he shall pay the Owner, as liquidated damages and not as a penalty, the sum as specified herein. Such amount is agreed upon as a reasonable and proper measure which the Owner will sustain each calendar day by failure of the Contractor to complete work within the stipulated time.

§ 9.11.3 For projects that have milestone completion dates, liquidated damages shall apply to all phased construction milestone dates as established by the phasing plan, sequencing section and/or the Summary of Work.

§ 9.11.4 Substantial completion will be determined by the Architect as defined in paragraph 9.8.1.

§ 9.11.5 For damage occurring at the time of delay, the Owner may retain the amount due to him under this clause from any payments due to the Contractor.

§ 9.11.6 The Owner will suffer financial loss if the project is not substantially complete on the date set forth in the Contract Documents. The Contractor (and the Contractor's Surety) shall be liable for and pay to the Owner the sum of $2,500.00 stipulated and fixed, agreed as liquidated damages for each calendar day of delay until the work is substantially complete.

§ 9.11.7 TWO THOUSAND FIVE HUNDRED ($2,500) PER DAY CALENDAR DAY FOR PUNCH LIST ITEMS. Contractor has thirty (30) days to complete the final punch list. Liquidated damages will be addressed starting on the 31st day after receipt of Notice of Substantial Completion or issuance of the Final Punch List, whichever comes later, to that date of the Construction Manager's and Architect's acceptance that all punch list(s) have been completed.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

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

§ 10.1.1

1. The Contractor shall fully comply with the job safety requirements in addition to all Federal, State and Local safety guidelines. All cost associated with complying with all safety requirements shall be included in each contractor's base bid.

2. The Contractor will serve as the overall Project Safety Coordinator and shall be responsible for all issues of safety and protection. The Contractor shall designate a safety person at the job site while the contractor is working on the project site. The designated safety person shall be responsible for the safety of their work and for their workers and to make continuous inspections for all safety issues relating to his work. The Architect and/or the Construction Manager are not responsible for safety on this project but will endeavor to promote safety. Each Contractor must comply with job Safety Requirements in
addition to OSHA and local agency requirements. Failure to comply with safety issues will be grounds for withholding of payments.

3. Contractor shall comply with all reasonable requests of the Owner and Construction Manager with respect to additional security and protections required for work interfacing with Facility Operations. Safety is of utmost importance on this project and all issues relative to safety and protection of the Facility, Staff and Occupants will be treated as emergency needs and will not be subject to the 7-day notice requirements of Article 14, Section 14.2.2.

   A. The Contractor shall provide, maintain, relocate and remove, in coordination the Construction Manager, a 6' high, perimeter security fence. Fence will surround the building and proposed parking areas and will have signage attached at 100' intervals advising “Construction Area – Please Keep Out”. The Contractor to be responsible for opening and securing site each day.
   B. Orange safety fencing shall be installed around the entire area of any and all earthwork, excavations, etc. and will be maintained until the work is complete.
   C. This is a hard hat job. Identifying hard hats shall be worn at all times.
   D. Hot work permits will be required for all activities involving open flames.

4. The proper execution of the required safety provisions is directly related to the general condition safety line item on the schedule of values. The failure to provide a competent person on site to properly identify and take immediate corrective action may result in deductions to the general condition safety line item of the schedule of values.

5. The Contractor shall be responsible for the immediate investigation and resolution of all safety and environmental complaints/issues generated by contractor employees, owners, owner’s representatives or members of the public.

6. Contractor shall maintain all egress routes throughout building. Contractor shall post exit signs as coordinated with the Construction Manager. Contractor shall provide wall hung fire extinguishers throughout building as deemed necessary by the Construction Manager and fire officials.

7. Contractor’s safety representative shall perform a daily safety inspection walk through to ensure that all requirements of the OSHA Standards, Fire Protection Standards and Safe Work Practices are being with and/or corrected. The responsibility of the Contractor is to provide a safe and healthy work environment for construction personnel, Owner’s personnel and representative, and the public.

8. Upon written receipt of safety concerns and/or issues, the Contractor shall respond in writing addressing how the safety concerns or issues were resolved. The Construction Manager shall be copied on all safety-related correspondence.

9. The Contractor’s response and compliance with correction of deficiencies noted in the safety concerns notice issued by the Authority having jurisdiction is mandatory. Failure to comply will be grounds for withholding of progress payments until the conditions are acceptable to O.S.H.A or Authority having local jurisdiction.

10. The Contractor shall submit to the Construction Manager, a copy of all licenses (welding, power nailers, asbestos, etc.) as required by applicable agencies.

11. Contractor shall have all required personal protective equipment and materials available for use by each employee as required by Federal, State and Local guidelines.

12. Contractor shall supply proper equipment and crew sizes as necessary to safely complete the work.

13. Contractor shall provide documented safety training for each of their employees and subcontractor’s employees no later than the first day they arrive on site. The training shall be documented and signed by the trainer and employee. A copy of all safety-training documents is to be provided to the Owner and updated as manpower loading increases.

14. The Contractor shall supply (2) two OSHA approved means of access/egress to each floor and roof for the course of the entire project for use by all applicable parties. The Contractor shall erect and maintain
OSHA approved pedestrian walking bridges, for emergency access/egress and as necessary to protect personnel from overhead work.

15. The Contractor shall be responsible for providing and maintaining all temporary emergency egress routes. The Contractor shall obtain the approval of the Building and Fire Departments for all temporary emergency egress routes. General Contractor to provide for fire separation walls between occupied areas as required by local officials.

16. Contractor shall provide, relocate and/or maintain barricades, signage, provide flagmen etc. as necessary to ensure public safety and safe egress. Contractor to provide, maintain, relocate and remove in coordination with the Construction Manager, the perimeter security fence.

17. Notify the Construction Manager, immediately upon arrival of OSHA to the site.

18. Contractor shall submit to the Construction Manager all MSDS sheets and shall cooperate in the posting of all required notifications relative to the use of hazardous substances on the property.

19. Contractor to comply with NJ Law regarding the use or storage of hazardous substances in Schools. MSDS sheets shall be posted prior to product being delivered to site.

20. Contractor, subcontractor, vendor, etc. should enforce a full time no smoking or alcohol use policy for all employees during the entire course of the project. Any worker found violating these restrictions, or being belligerent, will be subject to removal from the site at the sole discretion of Owner.

21. Contractor shall be responsible to secure the site at the end of each workday by an effective means and maintain until all parties determine no longer required.

22. Contractor must submit an acceptable OSHA compliant site specific written safety plan to the Construction Manager for review within fourteen (14) days from the notice to proceed or prior to mobilizing on site, whichever comes first. The written safety plan shall include (as applicable to their work) but is not limited to the following:
   - Full time no smoking policy or alcohol use is allowed on the project. Any worker found violating these restrictions, or being belligerent, will be subject to removal from the site. (Contractors shall post required signs).
   - Full time hard hat policy (identifying hard hats shall be worn at all times).
   - Site specific emergency action plan with contractor phone numbers, active 24 hours a day, 7 days a week.
   - Competent on-site safety representative, named and active (Provide alternate)
   - Scaffold erection plan, including a log of daily inspections.
   - Full time fall protection plan for exposures over 6'-0".
   - Job site signage plan (Perimeter fence warning signs posted 50'-0" o/c.
   - First aid and CPR provisions.
   - OSHA 200 log and Job Safety and Health Protection poster.
   - Daily clean up.
   - Hazard Communication Program with MSDS logged and maintained.
   - Hazard Communication program.
   - Daily diary of work, issues, and incident, etc.
   - Sheetig, shoring and excavations protection line.
   - GFI safety program.
   - Hazardous Energy Control Lock out tag out program.
   - Required safety clothes; Eye & ear protection, respirators, boots, belts, gloves etc. as appropriate to their work requirement.
   - Fire Extinguishers.
- Removal guard rail and protection at material loading areas, 200lb force minimum requirement.
- All stairs and platforms must have railings, 200lb force minimum requirement. Stair pains and landings must be filled prior to their use.
- Daily inspection of tools and equipment; verify safety devices are operational.
- Ladder usage plan.
- Weekly tool box meetings, documented and signed by each employee
- Temporary heat procedures.

23. Contractor shall maintain and submit a complete copy of the written safety plan, logs, diaries, plans and programs on site for the project files.

24. The Contractor shall provide a third-party Insurance Safety Site Inspection Report monthly and remedy all issues promptly.

The speed limit within the project property is 5MPH. Contractor employees operating vehicles in excess of the speed limit or in any otherwise unsafe manner will be directed to leave the site and not permitted to return.

§ 10.2 Safety of Persons and Property

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

1. employees on the Work and other persons who may be affected thereby;
2. the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
3. other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction, as well as any other real or personal property of the Owner.
4. The Contractor shall provide a third-party Insurance Safety Site Inspection Report monthly and remedy all issues promptly.

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

§ 10.2.2.1 Contractor shall comply with all regulations required by the Federal Occupational Safety and Health Act (OSHA).

§ 10.2.2.2 The Contractor shall conform to all applicable New Jersey Department of Environmental Protection regulations.

§ 10.2.2.3 Contractors must comply with construction and environmental standards contained in Federal and State Regulations and other applicable laws.

§ 10.2.2.4 It is the Contractor's responsibility to determine the existence of potentially hazardous materials, including lead, and to protect his workmen and the work area.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.
§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

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

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

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

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

§ 10.2.9 The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal. The area within the site limits under the Contractor’s control shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site. Contractor shall comply with all reasonable requests of the Owner and Construction Manager with respect to additional security and protections required for work interfacing with School Operations. Safety is of utmost importance on this project and all issues relative to safety and protection of the Administration, Public, Staff and Students will be treated as emergency needs and will not be subject to the 7-day notice requirements of Article 14, Section 14.2.2.

§ 10.2.10 The Contractor shall remove snow or ice which may accumulate on the site within areas under his control which might result in damage or delay.

§ 10.2.11 The Contractor shall take all precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained disappearance of property of the Owner and Contractor, whether or not forming part of the Work, located within those areas of the Project to which the Contractor has access. Whenever unattended, including nights and weekends, mobile equipment and operable machinery shall be kept locked and made inoperable and immovable.
§ 10.2.12 Neither the Owner nor the Construction Manager nor the Architect shall be responsible for providing a safe working place for the Contractor, the Subcontractors or their employees, or any individual responsible to them for the work.

§ 10.2.13 The Contractor shall conform to requirements of OSHA. The requirements of the New Jersey and Local Building Construction Codes shall apply where there are equal to or more restrictive than the requirements of the Federal Act.

§ 10.2.14 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work as necessary from injury or any cause.

§ 10.2.15 The Contractor shall promptly report in writing to the Owner, Construction Manager and Architect all accidents arising out of or in connection with the Work which caused death, personal injury or property damage giving full details and statements of any witnesses. In addition, if death, serious personal injury or serious property damage is caused, the accident shall be reported immediately by telephone or messenger to the Owner, Construction Manager and Architect.

§ 10.2.16 Contractor is required to follow and enforce the work rules set forth below. Failure to comply with or enforce any of these rules will be grounds for suspension and/or termination of this Contract:

.1 No use of alcoholic beverages prior to or during working hours. Anyone found impaired after lunch will be escorted from the Project site.

.2 No use of illegal drugs or prescription medications which could induce drowsiness or otherwise impair perception or performance. Use of illegal drugs may result in prosecution to the fullest extent of the law. Any warning associated with use of prescription drugs must be complied with, particularly warning against operation of machinery and equipment.

.3 No horseplay or rough-housing will be allowed.

.4 No sexual, racial, or ethnic harassment, or similar conduct will be tolerated.

.5 All employees shall use proper sanitation habits including use of toilet facilities and garbage cans.

.6 All employees shall dress in clothing appropriate for the work they are to perform. All personnel are to wear hardhats, safety shoes, glasses, gloves, masks or respirators, noise protection devices, and other protective clothing and equipment as required by OSHA standards.

.7 All equipment is to be properly stored and/or secured at the end of the work day or if it is to remain idle for greater than one hour.

.8 All personnel are to be made aware of the availability of Material Safety Data Sheets for materials used at the Project site. The Contractor shall maintain a copy of all MSDS forms at the construction site office for all personnel to review.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner, Construction Manager and Architect of the condition.
§ 10.3.2 Upon receipt of the Contractor’s notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor, Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor Construction Manager and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable additional costs of shutdown, delay, and start-up adjustments shall be accomplished as provided in Article 7.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect’s consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

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

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

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

§ 10.3.7 The Contractor shall submit to the Owner all MSDS sheets and shall cooperate in the posting of all required notifications relative to the use of hazardous materials on Owner’s property.

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

§ 10.4.1 - EMERGENCY/SAFETY PLAN

All parties involved in the construction process should be aware of emergency services that may be required during the construction process.
Contractor shall establish the site-specific Emergency Action Plan and, after approval by the owner, and local authorities, shall display at site trailers and various locations at the site.

In case of an accident, emergency, or injury on the job site, the Contractor shall immediately follow the Site-Specific Emergency Action Plan. Following the incident, the Contractor shall submit to the Construction Manager a complete written incident report detailing the circumstances which caused the accident, extent of injuries, damage to the building, time of accident, corrective action required, etc.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 Contractor’s Insurance and Bonds

All insurance provisions shall be confirmed with Owner’s Insurance Agent.

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

§ 11.1.2 Construction Manager to be included as additional insured in all places where Architect is named. Contractor shall, without in any way altering Contractor’s liability under the Contract or applicable law, obtain, pay for and maintain insurance for the coverages and amounts of coverage not less than those set forth below in the Schedule of Insurance Coverages and shall provide to Owner certificates issued by insurance companies satisfactory to Owner to evidence such coverage no later than 7 days of the date of the execution of this Contract and prior to any personnel or equipment being brought onto and/or before any work commences at the job site. The coverage afforded under any insurance obtained pursuant to this paragraph shall be primary to any valid and collectible insurance carried separately by any of the indemnitees. Such certificates shall provide that there shall be no cancellation, non-renewal or material change of such coverage without thirty (30) days prior written notice to Owner. In the event of any failure by Contractor to comply with the provisions of this Article 11, Owner may, at its option, on notice to Contractor, suspend the Contract for cause until there is full compliance with this Article 11 and/or terminate the Contract for cause. Alternatively, Owner may purchase such insurance at Contractor's expense, provided that Owner shall have no obligation to do so, and if Owner shall so do, Contractor shall not be relieved of or excused from the obligation to obtain and maintain such insurance amounts and coverages. Contractor shall provide to Owner a copy of any and all applicable insurance policies. The Owner, Construction Manager, Garrison Architects, the State of New Jersey, and Gloucester County shall be named as an additional insured on a primary and non-contributory basis on all Insurance Policies to be provided by the Contractor.

§ 11.1.3 Schedule of Insurance Coverages


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<thead>
<tr>
<th>.</th>
<th>Commercial General Liability, Each Occurrence</th>
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<tbody>
<tr>
<td>.a.</td>
<td>Each Occurrence: $ 5,000,000.00</td>
</tr>
<tr>
<td>.b.</td>
<td>Damage to Rented Premises: $ 300,000.00</td>
</tr>
<tr>
<td>.c.</td>
<td>Medical Expense (Any one person): $ 15,000.00</td>
</tr>
<tr>
<td>.d.</td>
<td>Personal &amp; Adv Injury: $ 3,000,000.00</td>
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<tr>
<td>.e.</td>
<td>General Aggregate: $ 5,000,000.00</td>
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<tr>
<td>.f.</td>
<td>Products – Comp/Op Agg: $ 5,000,000.00</td>
</tr>
</tbody>
</table>
.2 **Automobile Liability:** (Hired autos, scheduled autos, non-owned autos)
   
a. **Combined Single Limit (each accident):** $1,000,000.00

.3 **Workers Compensation and Employers Liability:**
   
a. **WC Statutory Limits:**
      1. E.L. Each Accident: $1,000,000.00
      2. E.L. Disease – Each Employee: $1,000,000.00
      3. E.L. Disease – Policy Limit: $1,000,000.00

.4 **Builder's Risk Insurance:** The Contractor shall provide Builder's Risk Insurance for all risk of physical loss or damage to the property described hereunder in an amount equal to the Total Project Value, and furnished under Construction Contracts for the School Facilities Project; excepting excavations, foundations and other structures customarily excluded by such insurance. The Policy shall name the Owner, State of New Jersey, and Gloucester County as loss payee as their interests may appear on a primary and non-contributory basis. The Builders Risk Policy is to include coverage for the perils of Earthquake, Flood, Full Windstorm, Equipment Breakdown and Theft (excluding employee theft), contain an endorsement allowing permission to occupy and include coverage for both transit and on-site storage. The policy is also to include all contractors, subcontractors and sub-subcontractors as well as the Owner, State of New Jersey, Gloucester County, the Construction Manager and Garrison Architects as Additional Named Insureds on a primary and non-contributory basis. The contractor and all subcontractors are responsible for all policy deductibles and uninsured or underinsured losses.

.5 The Policy shall name the following as Additional Insured:
The Owner, Garrison Architects, Construction Manager, the State of New Jersey, and
Gloucester County as additional insureds on a primary and non-contributory basis

.6 **Contractual liability insurance as applicable to the Contractor's obligations under Paragraph 3.18 of the AIA General Conditions.**

.7 **Workers' Compensation Insurance of not less than statutory limits.**

.8 **Completed Operations Insurance written to the limits specified for liability insurance specified under subparagraph .1 above. Coverage shall be required from the date of the start of Beneficial Occupancy until one year after the issuance date of Final Certificate for Payment.**

.9 **Certificates of insurance must be submitted on the ACORD Form, Certificate of Insurance. Contractor's ACORD Certificate of Insurance must state "Contractual Liability Included" or it will be rejected.**

.10 **The Contractor shall either**

   .1 require each of his subcontractors to procure and to maintain during the life of their subcontracts, Subcontractor's Public Liability and Property Damage, of the type and in the same amounts as specified in the preceding paragraph; or
insure the activities of their subcontractors under their respective policies.

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

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

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

§ 11.1.5 Contractor shall furnish a performance bond and a separate labor and material payment bond and a maintenance bond meeting all statutory requirements of the State of New Jersey in form and substance satisfactory to the Owner and without limitation complying with the following specific requirements:

.1 Except as otherwise required by statute, the form and substance of such bonds shall be substantially in accordance with the forms of bonds in the Bid Package and satisfactory to the Owner in the Owner’s sole judgment;

.2 The bonds shall be executed by a responsible surety licensed in the State of New Jersey with a Best’s rating of no less than A-/X and shall remain in effect for a period of not less than two years following the date of final acceptance or the time required to resolve any items of incomplete or inadequate work and the payment of any disputed amounts, whichever time period is longer. After final completion and prior to final payment, Contractor shall submit a maintenance bond in the amount of 100% of the cost of the project for a period of two years from final acceptance. Upon acceptance of the maintenance bond and final payment, Contractor’s performance bond will be released.

.3 The performance bond and the labor and material payment bond shall each be in an amount equal to the Contract Sum;

.4 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his power of attorney indicating the monetary limit of such power;

.5 Payment and performance bonds must have attached thereto a fully executed Surety Disclosure Statement and Certification;

.6 Any bond under this Paragraph 11.1.5 must display the surety’s bond number.

§ 11.1.6 If any of the foregoing insurance coverages are required to remain in force after final payment, including, but not limited to coverage for completed operations, an additional certificate evidencing continuation of such coverage shall be submitted with the Final Application for Payment.
§ 11.1.7 In no event shall any failure of the Owner to receive certificates of policies required under Paragraph 11.1 or to demand receipt of such certificates prior to the Contractor commencing Work be construed as a waiver of the Owner or the Architect of the Contractor’s obligations to obtain insurance pursuant to this Article 11. The obligation to procure and maintain any insurance required by this Article 11 is a separate responsibility of the Contractor and independent of the duty to furnish a certificate of such insurance policies.

§ 11.1.8 If the Contractor fails to purchase and maintain or require to be purchased and maintained any insurance required under this Article 11, the Owner may, but shall not be obligated to, upon 5 days written notice to the Contractor, purchase such insurance on behalf of the Contractor and shall be entitled to deduct said cost from the Contractor's Contract Sum.

§ 11.1.9 When any required insurance due to the attainment of a normal expiration date or renewal date shall expire the Contractor shall supply the Owner with certificates of insurance and amendatory riders or endorsements that clearly evidence the continuation of all coverage in the same manner, limits of protection and scope as was provided by the previous policy. In the event, any renewal or replacement policy for whatever reason obtained or required is written by a carrier other than that with whom the coverage was previously placed or the subsequent policy differs in any way from the previous policy, the Contractor shall also furnish replacement policy unless the Owner provides the Contractor with prior written consent to submit only a certificate of insurance for any such policy. All renewal and or replacement policies shall be in form and substance satisfactory to the Owner and written by carriers acceptable to the Owner.

§ 11.1.10 The Contractor shall cause each subcontractor to (1) procure insurance in the amounts set forth in Article 11 and (2) name the indemnitees under Paragraph 3.18 as additional insureds under the subcontractor’s comprehensive general liability policy. The additional insured endorsement included on the subcontractor’s comprehensive general liability policy shall state that coverage is afforded the additional insureds with respect to claims arising out of operations performed by or on behalf of the Contractor. If the additional insureds have other insurance which is applicable to the claims, such other insurance shall be on an excess or contingent basis. The amount of the insurance liability under this insurance policy shall not be reduced by the existence of such other insurance.

§ 11.1.11 Property insurance provided by the Owner shall not cover any tools, apparatus, machinery, scaffolding, hoists, forms, staging, shoring, or other similar items commonly referred to as construction equipment which may be on the site and the capital value of which is not included in the work. The Contractor shall make its own arrangements for any insurance it might require on such construction requirement. Any such policy obtained by the Contractor under this Paragraph 11.4.7 shall include a waiver of subrogation.

§ 11.1.12 The Contractor may carry whatever additional insurance he deems necessary to protect himself against hazards not covered for theft, collapse, water damage, materials and equipment stored on the site, and for materials and equipment stored off site, and against loss of owned or rented capital equipment and tools owned by mechanics or any tools, equipment, scaffolding, stagings, towers and forms owned or rented by the Contractor, the capital value of which is not included in the cost of the Work.

§ 11.1.13 All insurance coverage procured by the Contractor shall be provided by insurance companies having policy holder ratings no lower than "A-" and financial rating no lower than, "X" in the Best's Insurance guide, latest edition in effect as the date of the Contract and subsequently in effect at the time of the renewal of the policies required by the Contract Documents.
§ 11.1.14 If the Owner or the Contractor is damaged by the failure of the other party to purchase or maintain insurance required under Article 11, then the party who failed to purchase or maintain the insurance shall bear all reasonable costs (including attorney’s fees and court and settlement costs) properly attributable thereto.

§ 11.1.15 The Contractors must remove all “X, C & U” exclusions from their policies.

§ 11.2 Owner’s Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner’s Required Property Insurance. Within three (3) business days after the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect’s consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceed of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect’s consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance
premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project-construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance
The Owner, at the Owner’s option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner’s property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner’s property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss
§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days to receive notice of the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK
§ 12.1 Uncovering of Work
§ 12.1.1 If a portion of the Work is covered contrary to the Architect’s request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect’s examination and be replaced at the Contractor’s expense without change in the Contract Time or Contract Sum.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor’s expense.
§ 12.2 Correction of Work
§ 12.2.1 Before Substantial Completion
The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense. If prior to the date of Substantial Completion, the Contractor, a subcontractor or anyone for whom either is responsible, uses or damages any portion of the Work, including without limitation, mechanical, electrical, plumbing and other building systems, machinery, equipment or other mechanical device, the Contractor shall cause each such item to be restored to "like new condition" at no expense to the Owner.

§ 12.2.2 After Substantial Completion
§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year two (2) years after the date of Substantial Completion Final Acceptance of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

.1 The obligations under Item 12.2 shall cover any repairs and replacement to any part of the Work or other property caused by the defective Work.
.2 Upon completion of any work under or pursuant to Item 12.2., the two-year correction period in connection with the work requiring correction shall be renewed and recommenced.

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

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

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

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

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the two-year one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents shall be fulfilled.

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§ 12.3 Acceptance of Nonconforming Work
If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made. This paragraph relates exclusively to the knowing acceptance of nonconforming work by the Owner. It has no applicability to work accepted by the Owner or Architect without the knowledge that such work fails to conform to the requirements of the Contract Documents.

ARTICLE 13 MISCELLANEOUS PROVISIONS
§ 13.1 Governing Law
The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction’s choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

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

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

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

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

§ 13.4 Tests and Inspections
§ 13.4.1 The Owner shall provide and contract for “structural tests and special inspections” as required by the NJ DCA Bulletin 03-5. The Contractor shall coordinate, schedule, and provide on-site supervision and man-power to facilitate the testing. All other Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or laws or regulations prohibit the Owner from
delegating their cost to the Contractor. The Architect, Owner and Contractor shall be afforded a reasonable opportunity to attend, observe, and witness all inspections and tests of the Work. The Architect or Owner may at any time request and receive from the Contractor satisfactory evidence that materials, supplies or equipment are in conformance with the Contract Documents. The Conduct of any inspection of test and the receipt of any approval shall not operate to relieve the Contractor from its obligations under the Contract Documents unless specifically so stated by Owner in writing. Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

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

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect’s services and expenses, shall be at the Contractor’s expense. The Contractor also agrees that the cost of testing services required for the convenience of the Contractor in his scheduling and performance of the Work and the cost of testing services related to remedial operations performed to correct deficiencies in the Work shall be borne by the Contractor.

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

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

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

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

§ 13.5.1. The Contractor shall not be entitled to any payment of interest for any reason, action or inaction by the Architect or the Owner unless required by law under N.J.S.A. 2A:30A-2(c).

§ 13.5.2 Any payments withheld for time delays, faulty materials, or workmanship, shall not bear interest for period of delay or non-acceptance.
§ 13.6 WRITTEN NOTICE
Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail, by courier service, overnight delivery providing proof of delivery to, the last business address known to the party giving notice.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
§ 14.1 Termination by the Contractor
§ 14.1.1 The Contractor may terminate the Contract in the manner provided in Subparagraph 14.1.2 if repeated suspensions, delays or interruptions by the Owner as described in Paragraph 14.3 constitute in the aggregate more than 100% of the total number of days scheduled for completion or 120 days in any 365-day period, whichever is less, or if all the Work is entirely stopped for a continuous period of 90 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:
1. Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
2. An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
3. Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment (without cause) within the time stated in the Contract Documents; or
4. The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 If any one of the above reasons exists, the Contractor may, upon fourteen (14) days written notice to the Owner and Architect, terminate the Contract, unless this reason is cured prior to the expiration of the notice, and recover from the Owner payment of work properly executed in accordance with the Contract Documents (the basis for such payment shall be as provided in the Contract) and for payment for cost directly related to work thereafter performed by Contractor in terminating such work including reasonable demobilization and cancellation charges provided said work is authorized in advance by Architect and Owner. The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 The Owner shall not be responsible for damages for loss of anticipated profits on work not performed on account of any termination described in Subparagraph 14.1.1 and 14.1.2.
If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

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

1. repeatedly refuses or fails to supply enough properly skilled workers or proper materials and/or equipment;

2. fails to make prompt payment to Subcontractors or suppliers in accordance with the Prompt Payment Act N.J.S.A. 2A:30A-2 (b);

3. repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

4. otherwise is guilty of substantial breach of a provision of the Contract Documents or disregards the instructions of Architect or Owner (when such instructions are based on the requirements of the Contract Documents);

5. is adjudged bankrupt or insolvent, or makes a general assignment for the benefit of Contractor's creditors, or a trustee or a receiver is appointed for Contractor or for any of its property, or files a petition to take advantage of any debtor's act, or to recognize under bankruptcy or similar laws; or

6. Breaches any warranty made by the Contractor under or pursuant to the Contact Documents,

7. fails to furnish the Owner with assurances satisfactory to the Owner evidencing the Contractor's ability to complete the Work in compliance with the requirements of the Contract Documents.

8. fails after the commencement of the Work to proceed continuously with the construction and completion of the work for more than 10 days except as permitted under the Contract Documents.

9. Otherwise does not fully comply with the Contract Documents.

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

1. Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

2. Accept assignment of subcontracts pursuant to Section 5.4; and

3. Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

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

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

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent
that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible, or
2— that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience
§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner’s convenience, the Contractor shall
1 cease operations as directed by the Owner in the notice;
2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner’s convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

§ 14.4.4 If Owner terminates the Contract for cause pursuant to Paragraph 14.2 and it is subsequently determined that the Owner was not authorized to terminate the Contract as provided in Paragraph 14.2, the Owner’s termination shall be treated as a termination for convenience under this Paragraph 14.4 and the rights and obligations of the parties shall be the same as if the Owner has issued a notice of termination to the Contractor as provided in this Paragraph 14.4.

ARTICLE 15 CLAIMS AND DISPUTES
§ 15.1 Claims
§ 15.1.1 Definition
A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term “Claim” also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims
The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the law and requirements of the State of New Jersey the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in no case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.2.1 Contractor shall promptly pay to Owner all costs and reasonable attorney’s fees incurred in connection with any action or proceeding in which Owner prevails, based on a breach of the Contract or other dispute arising out of or in connection with the Contract.
§15.1.2.2 In the event of the appointment of a trustee and/or receiver or any similar occurrence affecting the management of the account of the Contractor pertaining to the Work, it shall be the obligation of the Contractor, its representatives, receivers, sureties, or successors in interest to continue the progress of the Work without delay and specifically to make timely payment to Subcontractors and Suppliers of all amounts that are lawfully due them and to provide the Owner and all Subcontractors and Suppliers whose work may be affected with timely notice of the status of receivership, bankruptcy, etc., and the status of their individual accounts.

§15.1.2.3 Regularly scheduled job meetings shall be held at a location and time convenient to the Owner's representatives, the Architect and the Contractor. The Contractor shall attend such meetings, or be represented by a person in authority who can speak for and make decisions for the Contractor.

§15.1.3 Notice of Claims
§15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 24 hours after occurrence of the event giving rise to such Claim or within 24 hours after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§15.1.3.2 Injury or Damage to Person or Property. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding five (5) days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

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

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

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

§15.1.4.3 Claims for Concealed or Unknown Conditions. Subject to the Contractor's obligations under Articles 1.9.2 and 2.3.4, if conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than five (5) days after first observance of the conditions. The Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different
from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within 5 days after the Architect has given notice of the decision. If the conditions encountered are materially different, the Contract Sum and Contract Time shall be equitably adjusted, but if the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Section 15.2.5.1.

§ 15.1.5 Claims for Additional Cost
If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 herein shall be given to the Owner, Construction Manager and Architect before proceeding to execute the portion of the Work that is the subject of the Claim and within five (5) days after the occurrence of the event giving rise to such Claim for increase in the Contract Sum. The foregoing written notice shall contain a written statement from the Contractor setting forth in detail the nature and cause of the Claim and an itemized statement of the increase requested. No such written notice shall form the basis of an increase to the Contract Sum unless and until such increase has been authorized by a written Change Order executed and issued according to the terms and conditions set forth herein. The Contractor hereby acknowledges that the Contractor shall not have any right to and the Owner will not consider any requests for an increase in the Contract Sum that is not submitted in compliance with the foregoing requirements. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time
§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. Said notice shall itemize all claims and shall contain sufficient detail and substantiating data to permit evaluation of same by Owner and Architect. No such claim shall be valid unless so made. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary. Any change in the Contract Sum resulting from such claim shall be authorized only by Change Order or Construction Change Directive, as the case may be. All required notices for additional costs shall be made by Certified Mail.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were unusually severe for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction as determined by reference to historical data. The term "historical data" as used in the previous sentence shall be construed according to this formula: Average rainfall (or snow or low temperature) for the past five years.

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

1. damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

2. damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.
This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision
§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11-5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

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

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

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

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

§ 15.2.5.1 All claims and disputes and other matters in question between the Contractor and the Owner not resolved through mediation and arising out of or relating to the Contract Documents or a breach thereof with regard to the Architect's decision, shall be decided through suit in New Jersey Superior Court venue in the County that the Owner occupies and Contractor consents to the jurisdiction of the New Jersey Superior Court venue in the County that the Owner occupies. The Contractor shall carry on all work and maintain its progress during such suit and the Owner shall continue to make payments not related to the dispute of the Contractor in accordance with Contract Documents.
§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

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

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

§ 15.3 ALTERNATE DISPUTE RESOLUTION: MEDIATION

1. Controversies and Claims Subject to Mediation:
Any controversy or claim arising from or related to the contract or the breach thereof, shall be submitted to mediation. If a dispute between the Owner and the Contractor arises during the course of the contract, the parties will attempt to resolve the dispute, in good faith, through mediation.

2. Contract Performance Pending Mediation:
During mediation proceedings, the Contractor shall continue to perform under the terms of the contract and the Owner shall continue to make payments under the terms of the contract.

3. When Mediation May Be Demanded:
Prior to either party requesting or demanding mediation, they shall attempt to resolve the problem directly. The aggrieved party shall submit, in writing, to the other party, a notice of dispute.

The other party shall respond in writing.

Demand for mediation of any claim shall not be made until the earlier of the following:

(a) Written notice of dispute is given to other party and written response is provided to the aggrieved party.

(b) Thirty days after submission of original written claim by aggrieved party to other party and the other party has not responded in writing.

A party who files a “Notice of Demand for Mediation” must assert in the demand all claims then known to that party on which mediation is permitted to be deemed. When a party fails to include a claim through oversight, inadvertence or excusable neglect, or when a claim has matured or been acquired subsequently, the mediator or mediators may permit amendments.
If a party submits a claim and is not satisfied with the written response received, the aggrieved party has forty-five (45) days from the receipt of the written response to file a request for mediation.

4. Procedures to Request Mediation:

a) Either party may demand mediation by written notice to the other party. The written notice shall contain at least (1) a brief statement of the nature of the dispute, and (2) the name, address and the phone number of that party’s designated representative for purposes of mediation.

b) The other party shall designate its representative for mediation in writing no later than five (5) business days after receipt of the demand for mediation.

c) The respective designees shall thereupon, and promptly, with due regard for the need for timely action, choose a mediator.

d) If the parties cannot agree on a mediator, they shall choose a reputable mediation firm.

e) Any mediation firm so chosen shall present a list of at least five (5) proposed mediators to the parties and shall provide the parties with a summary of each person’s qualifications to serve as mediator.

f) Each party shall rank the proposed mediators in order of preference.

g) The fifth and any lower ranked persons on each list will be excluded from further consideration.

h) The chosen mediator shall be the remaining person who is the combined highest-ranking mediator on both preference lists, after deleting all excluded persons.

i) In the event of a tie, the mediator shall be chosen by lot.

5. Procedures at Mediation:

The mediation shall be conducted in such reasonable and efficient manner as may be agreed between the parties and the mediator or, in the lack of such an agreement, as may be determined by the mediator.

The parties will not be bound by the Rules of Evidence in presenting their positions before the mediator.

6. Cost of Mediation:

Each party will bear its own costs of participation in mediation and they will divide the costs of the mediator equally.

7. Failure of Mediation:

If, after a good faith effort to resolve the dispute through mediation, the dispute is not resolved, either party may terminate the mediation by written notice to the mediator and to the other party, whereupon either party may submit the dispute to the Superior Court of New Jersey, Gloucester County, for adjudication, which court shall have exclusive original jurisdiction over the dispute.
AGREEMENT made as of the [day] day of [date] in the year Two Thousand Nineteen
(In words, indicate day, month and year.)

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

Rowan College at Gloucester County
1400 Tanyak Road
Sewell, New Jersey 08080

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

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

Economic Development Center and Rowan Medicine at Rowan College at Gloucester County
1400 Tanyak Road
Sewell, New Jersey 08080

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

Garrison Architects
713 Creek Road
Bellmawr, New Jersey 08031

The Owner and Contractor agree as follows.

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

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

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

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

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4  CONTRACT SUM
5  PAYMENTS
6  DISPUTE RESOLUTION
7  TERMINATION OR SUSPENSION
8  MISCELLANEOUS PROVISIONS
9  ENUMERATION OF CONTRACT DOCUMENTS

ARTICLE 1  THE CONTRACT DOCUMENTS
The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2  THE WORK OF THIS CONTRACT
The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3  DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

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

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

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.
§ 3.3 Substantial Completion
§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

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

[ ] Not later than [ ] calendar days from the date of commencement of the Work.

[ ] By the following date: January 19, 2021

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

<table>
<thead>
<tr>
<th>Portion of Work</th>
<th>Substantial Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Development Center</td>
<td>August 28, 2020</td>
</tr>
</tbody>
</table>

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

ARTICLE 4 CONTRACT SUM
§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor’s performance of the Contract. The Contract Sum shall be $100,000.00 ($100,000.00 Economic Development Center, $100,000.00 Rohnan Medicine), subject to additions and deductions as provided in the Contract Documents.

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASH ALLOWANCE</td>
<td>$400,000.00 ($100,000.00 Economic Development Center, $300,000.00 Rohnan Medicine)</td>
</tr>
</tbody>
</table>

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. NOT APPLICABLE
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate)

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

§ 4.4 Unit prices, if any: NOT APPLICABLE
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

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

§ 4.5.1 The Contractor understands and agrees that all work must be performed in an orderly and closely coordinated sequence so that the date for substantial completion is met.

§ 4.5.2 If the Contractor fails to complete his work or fails to complete a portion of his work, he shall pay the Owner, as liquidated damages and not as a penalty, the sum as specified herein. Such amount is agreed upon as a reasonable and proper measure which the Owner will sustain each calendar day by failure of the Contractor to complete work within the stipulated time.
§ 4.5.3 For projects that have milestone completion dates, liquidated damages shall apply to all phased construction milestone dates as established by the phasing plan, sequencing section and/or the Summary of Work.

§ 4.5.4 Substantial completion as defined in paragraph 9.8 of the AIA Document A201-2017 General Conditions of the Contract for Construction will be determined by the Architect.

§ 4.5.5 For damage occurring at the time of delay, the Owner may retain the amount due to him under this clause from any payments due to the Contractor.

§ 4.5.6 The Owner will suffer financial loss if the project is not substantially complete on the date set forth in the Contract Documents. The Contractor (and the Contractor's Surety) shall be liable for and pay to the Owner the sum of $2,500.00 stipulated and fixed, agreed as liquidated damages for each calendar day of delay until the work is substantially complete.

§ 4.5.7 TWO THOUSAND FIVE HUNDRED ($2,500) PER DAY CALENDAR DAY FOR PUNCH LIST ITEMS. Contractor has thirty (30) days to complete the final punch list. Liquidated damages will be addressed starting on the 31st day after receipt of Notice of Substantial Completion or issuance of the Final Punch List, whichever comes later, to that date of the Construction Manager's and Architect's acceptance that all punch list(s) have been completed.

§ 4.6 Other: NOT APPLICABLE
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

ARTICLE 5 PAYMENTS
§ 5.1 Progress Payments
§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

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

The Owner will issue timely payments to the Contractor in accordance with the requirements of "The Prompt Payment Act", N.J.S.A. 2A:30A-1, et seq. The Contractor is hereby notified that the Owner, as a public entity, requires all payments to be approved at scheduled public Board of Trustees meetings. The vote on authorization for payments will be made at the first public meeting of the Board, following the Board's receipt of the Contractor's authorization for payment, and paid during the subsequent payment cycle. The time schedule will be established at the Pre-Construction Meeting and subsequent project meetings.

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment (Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.
§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. Contractors are requested not to project work beyond the date of the pencil copy of the Application for Payment.

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

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

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

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

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

§ 5.1.7 Retainage

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

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

Until substantial completion, the Owner will pay 98% of the amount due the Contractor on account of progress payments until a balance of $500,000 is due the Contractor. The retainage will then be increased to Five Percent (5%) of the $500,000.00 balance of the contract until final completion. The retainage will be held until final acceptance of the project by the Architect and the Owner.

§ 5.1.7.1.1 The following items are not subject to retainage: NOT APPLICABLE

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

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows: NOT APPLICABLE

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

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7.

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall only be responsible to pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201-2017.
§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

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

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

.2 a final Certificate for Payment has been issued by the Architect.

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

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

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

Prime plus 1% Prime Plus One Percent

If a payment due pursuant to the provisions of this section is not made in a timely manner, the delinquent party shall be liable for the amount of money owed under the contract, plus interest at a rate equal to the prime rate plus 1%. Interest on amounts due pursuant to this section shall be paid to the prime contractor, subcontractor or subsubcontractor for the period beginning on the day after the required payment date and ending on the day on which the check for payment has been drawn.

ARTICLE 6 DISPUTE RESOLUTION
§ 6.1 Initial Decision Maker
The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

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

(Check the appropriate box.)

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

[ ] Litigation in a court of competent jurisdiction

[] Other (Specify)

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.
ARTICLE 7  TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows: NOT APPLICABLE
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

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

ARTICLE 8  MISCELLANEOUS PROVISIONS
§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

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

Mr. Jim Lauria
Greyhawk
2000 Midlantic Drive, Suite 210
Mount Laurel, New Jersey 08054

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

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

§ 8.5 Insurance and Bonds
§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in Article 11 of the AIA Document A201™–2017.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A201™–2017.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below: NOT APPLICABLE
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)
§ 8.7 Other provisions:

The Drawings, Specifications and Addenda shall be considered as part of this Contract.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

1. AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
2. AIA Document A201™-2017, General Conditions of the Contract for Construction
3. Drawings: See Attached Indexes
4. Specifications: See Attached Indexes
5. Addenda, if any:

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Pages</th>
</tr>
</thead>
</table>

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

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

[ ] AIA Document E204™-2017, Sustainable Projects Exhibit, dated as indicated below:
   (Insert the date of the E204-2017 incorporated into this Agreement.) NOT APPLICABLE

[ ] The Sustainability Plan: NOT APPLICABLE

[ ] Supplementary and other Conditions of the Contract: The Supplementary General Conditions are incorporated directly into the AIA201 - General Conditions of the Contract for Construction.

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

The Drawings, Specifications, Addenda and Contractor's complete Bid Package shall be considered as part of this Contract. The New Jersey Prevailing Wage Rates are incorporated herein by reference. In the event of a conflict in the provisions of any of the Contract Documents the provision most favorable to the Owner shall control.

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

OWNER (Signature)  

(CONTRACTOR (Signature)  

(Part name and title)  

(Part name and title)
ROWAN COLLEGE at GLOUCESTER COUNTY
WORKFORCE DEVELOPMENT CENTER
AND
ROWAN MEDICINE

ROWAN COLLEGE at GLOUCESTER COUNTY
PROJECT LABOR AGREEMENT

ARTICLE 1 - PREAMBLE

WHEREAS, The Rowan College at Gloucester County ("College"), as Owner, desires to provide for the efficient, safe, quality, and timely completion of a construction project for the Rowan College at Gloucester County ("RC@GC") in a manner designed to afford lower reasonable costs to the College, and the Public it represents, and the advancement of public policy objectives;

WHEREAS, this Project Labor Agreement will foster the achievement of these goals, inter alia by:

(1) ensuring a reliable source of skilled and experienced labor;
(2) standardizing the terms and conditions governing the employment of labor on the Project;
(3) permitting wide flexibility in work scheduling and shift hours and times; from those which otherwise might obtain;
(4) receiving negotiated adjustments as to work rules and staffing requirements from those which otherwise might obtain;
(5) providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;
(6) avoiding the costly delays of potential strikes, slowdowns, walkouts, picketing and other disruptions arising from work disputes, and promote labor harmony and peace for the duration of the Projects.

(7) furthering public policy objectives as to improved employment opportunities for minorities, women and the economically disadvantaged in the construction industry;

(8) expediting the construction process;

WHEREAS, the signatory Unions desire the stability, security and work opportunities afforded by a Project Labor Agreement; and
WHEREAS, the Parties desire to maximize Project safety conditions for both workers and the public,

NOW, THEREFORE, the Parties enter into this Agreement:

SECTION 1. PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into by and between the College and its successors and assigns, Contractors to be named for certain construction work to be performed on the Rowan College at Gloucester County in the State of New Jersey (such Contractors joining by Letters of Assent in the form of Schedule B attached), and by the United Building Trades Council of Southern New Jersey, AFL-CIO, on behalf of itself and its affiliates and members.

ARTICLE 2 - GENERAL CONDITIONS

SECTION 1. DEFINITIONS

Throughout this Agreement, the Union party and the United Building Trades Council of Southern New Jersey, AFL-CIO are referred to singularly and collectively as the ("Union(s)") where specific reference is made to "Local Unions" that phrase is sometimes used; the term ("Contractor(s)") shall include all signatory Contractors, and their subcontractors of whatever tier, engaged in on-site Project construction work within the scope of this Agreement as defined in Article 3; Rowan College at Gloucester County is referenced as ("College") or ("Owner"); the United Building Trades Council of Southern New Jersey, AFL-CIO is referenced as the ("BTC"), and the work covered by this Agreement (as defined in Article 3) is referred to as the "Project".
SECTION 2. CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

The Agreement shall not become effective unless executed by the BTC, the College, and will remain in effect until the completion of the Project.

SECTION 3. ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

This Agreement shall be binding on all signatory Unions, the College and all signatory Contractors performing on-site Project work, including site preparation and staging areas, as defined in Article 3. The Contractors shall include in any subcontract that they let, for performance during the term of this Agreement, a requirement that their subcontractors, of whatever tier, become signatory and bound by this Agreement with respect to subcontracted work performed within the scope of Article 3.

SECTION 4. SUPREMACY CLAUSE

This Agreement, together with the local Collective Bargaining Agreements appended hereto as Schedule A represents the complete understanding of all signatories and supersedes any national agreement, local agreement or other collective bargaining agreement of any type which would otherwise apply to this Project, in whole or in part. Where a subject covered by the provisions, explicit or implicit, of this Agreement is also covered by a Schedule A, the provisions of this Agreement shall prevail. It is further understood that the Contractors shall be required to sign any other agreement as a condition of performing work on this Project. No practice, understanding or agreement between a Contractor and Local Union, which is not explicitly set forth in this Agreement, shall be binding on this Project.

SECTION 5. LIABILITY

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. A Contractor shall not be liable for any violations of this Agreement by any
other Contractor. Further, the BTC and the Local Unions shall not be liable for any violations of this Agreement by any other Union.

SECTION 6. THE CONSTRUCTION PROJECT MANAGER

The College shall require in its bid specifications for all work within the scope of Article 3 that all successful bidders, and their subcontractors of whatever tier, become bound by, and signatory to, this Agreement. It is understood that nothing in this Agreement shall be construed as limiting the sole discretion of the College in determining which Contractors shall be awarded contracts for Project work. It is further understood that the College has sole discretion at any time to terminate, delay or suspend the work, in whole or part, on this Project.

SECTION 7. AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

The Unions agree that this Agreement will be made available to, and will fully apply to any successful bidder for Project work who becomes signatory thereto, without regard to whether that successful bidder performs work at other sites on either a union or non-union basis and without regard to whether employees of such successful bidder are, or are not, members of any unions. This Agreement shall not apply to the work of any Contractor which is performed at any location other than the Project site, as defined in Article 3, Section 1.

ARTICLE 3 - SCOPE OF THE AGREEMENT

The Project work covered by this Agreement shall be as defined and limited by the following sections of this Article.

SECTION 1. THE WORK

This Agreement shall apply to the following construction conducted at the proposed site for Workforce Development Center and Rowan Medicine as a single project for Rowan College at Gloucester County, Gloucester County, New Jersey:
Project Description:

The Workforce Development Center and Rowan Medicine at Rowan College at Gloucester County, 1400 Tanyard Road, Sewell, New Jersey 08080

The Workforce Development Center is an approximately 15,633 one-story steel frame building and includes: New Jersey Department of Labor and Workforce Development, the Gloucester County Chamber of Commerce, and the Gloucester County Economic Development Office area; Toilet Rooms, Janitor’s Closet, Storage, Electrical and IT Rooms; All structural and steel work; All plumbing work and sprinkler system; All HVAC work (BMS Controls by Tozour Trane / Owner); All electrical work (fire alarm work by Tyco / Owner); All site work, walkways, utilities, grading, water, gas, sewer, storm, and landscaping work; All site utility modifications; Outdoor standby generator; IT Systems wiring; and Roof Inspection Services.

The Rowan Medicine Building is an approximately 56,545 SF two-story steel frame building and includes: The first floor includes: Four (4) outpatient medical clinics including Family Medicine, OMM / NMI / Pain Management, MHID (Mental Health), and Pediatrics; Lobby Café Area and a Physical Therapy Suite; The second floor includes: Rowan University College of Osteopathic Medicine and the Dean of Academics Offices for one hundred (144) students; Toilet Rooms, Janitor’s Closet, Storage, Electrical and IT Rooms; All structural and steel work; All plumbing work and sprinkler system; Nurse’s call syste; All HVAC work (BMS Controls by Tozour Trane / Owner); All electrical work (fire alarm work by Tyco / Owner); All site work, walkways, utilities, grading, water, gas, sewer, storm, and landscaping work; Security System; All site utility modifications; Outdoor standby generator; IT Systems wiring; Roof Inspection Services.
SECTION 2. EXCLUDED EMPLOYEES

The following persons are not subject to the provisions of this Agreement, even though performing work on the Project:

A. Superintendents, supervisors (excluding superintendents and general supervisors and forepersons specifically covered by a craft's Schedule A), Engineers, Architects, inspectors and testers (excluding divers specifically covered by a craft's Schedule A), quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers, guards, non-manual employees, and all professional, engineering, administrative and management persons;

B. Employees of Owner or any State agency, authority or entity or employees of any municipality or other public employer;

C. Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, assembly, painting, handling or fabrication of project components, materials, equipment or machinery, unless such offsite operations are covered by the New Jersey Prevailing Wage Act by being dedicated exclusively to the performance of the public works contract or building project and are adjacent to the site of work, or involved in deliveries to and from the Project site, excepting local deliveries of all major construction materials including fill, ready mix, asphalt and Item 4 which are covered by this Agreement.

D. Employees of the or Contractors, excepting those performing manual, on-site construction labor who will be covered by this Agreement;

E. Employees engaged in on-site equipment warranty.

F. Employees engaged in geophysical testing (whether land or water) other than boring for core samples;
G. Employees engaged in laboratory or specialty testing or inspections;

H. Employees engaged in ancillary Project work performed by third parties such as electric utilities, gas utilities, telephone utility companies, and railroads.

SECTION 3. NON-APPLICATION TO CERTAIN ENTITIES

This Agreement shall not apply to the parents, affiliates, subsidiaries, or other joint or sole ventures of any Contractor which do not perform work at this Project. It is agreed, for the purposes of this Agreement only, that this Agreement does not have the effect of creating any joint employment, single employer or alter ego status among the Owners, and/or any Contractor. The Agreement shall further not apply to the Owner, its Construction Management firm, Clerk of the Works, or any other state or county agency, authority, or other municipal or public entity, and nothing contained herein shall be construed to prohibit or restrict the Owner or its employees, or the employees of any other state authority, agency or entity from performing on or off-site work related to the Project. As the contracts which comprise the Project work are completed and accepted, the Agreement shall not have further force or effect on such items or areas except where inspections, additions, repairs, modifications, check-out and/or warranty work are assigned in writing (copy to Local Union involved) by any Contractors for performance under the terms of this Agreement.

ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT

SECTION 1. PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining representatives of all craft employees who are performing on-site Project work within the scope of this Agreement as defined in Article 3.

SECTION 2. UNION REFERRAL
1. The Contractors agree to hire Project, craft employees covered by this Agreement through the job referral systems and hiring halls (where the referrals meet the qualifications set forth in items 1, 2, and 4 subparagraph B) established in the Local Unions' area collective bargaining agreements (attached as Schedule A to this Agreement).

Notwithstanding this, the Contractors shall have sole rights to determine the competency of all referrals; the number of employees required (except with regard to piledriving); the selection of employees to be laid-off (subject to the applicable procedures in Schedule A for permanent and/or temporary layoffs and except as provided in Article 5, Section 3); and the sole right to reject any applicant referred by a Local Union, subject to the show-up payments required in the applicable Schedule A. In the event that a Local Union is unable to fill any request for qualified employees within a 48-hour period after such requisition is made by the Contractor (Saturdays, Sundays, and holidays excepted), the Contractor may employ qualified applicants from another competent source.

In the event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of the Project, craft employees hired within its jurisdiction from any source other than referral by the Union.

2. A Contractor may request by name, and the Local will honor, referral of persons who have applied to the Local for Project work and who meet the following qualifications as determined by a Committee of 3 designated, respectively, by the applicable Local Union, the Owner and a mutually selected third party or, in the absence of agreement, the permanent arbitrator (or designee) designated in Article 7:

   (1) possess any license required by New Jersey law for the Project work to be performed;

   (2) have worked a total of at least 1000 hours in the Construction craft during the prior 3 years;
(3) were on the Contractor's active payroll for at least 60 out of the 180
    calendar days prior to the contract award;

(4) have demonstrated ability to safely perform the basic function of the
    applicable trade.

No more than 12 per centum of the employees covered by this Agreement, per Contractor by
    craft, shall be hired through the special provisions above (any fraction shall be rounded to the next
    highest whole number).

3. A certified MBE/WBE contractor may request from the Workforce
    Coordinator, through the Owner, an exception to, and waiver of, the above per centum limitation upon
    the number of it's employees to be hired through the special provision of Section2.B above. This
    exception is based upon hardship and demonstration by the contractor that the Project work would be
    the contractor's only job and that it would be obliged to lay off qualified minority and female
    employees in its current workforce moving from the last job.

The exception and waiver are also conditioned upon the employees meeting the qualifications as set
    forth in Section 2.B above.

SECTION 3. NON-DISCRIMINATION IN REFERRALS

The Unions represent that their hiring halls and referral systems will be operated in a non-
    discriminatory manner and in full compliance with all applicable federal, state and local laws and
    regulations, which require equal employment opportunities. Referrals shall not be affected in any way
    by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union
    membership, policies or requirements and shall be subject to such other conditions as are established in
    this Article. No employment applicant shall be discriminated against by any referral system or hiring
    hall because of the applicant's union membership, or lack thereof.

SECTION 4. MINORITY AND FEMALE REFERRALS
In the event a Union either fails, or is unable, to refer qualified minority or female applicants in percentages equaling Project affirmative action goals as set forth in the Owners bid specifications, the Contractor may employ qualified minority or female applicants from any other available source as Apprentice Equivalents. Apprentice Equivalents will have completed a Department of Labor approved training program, applied to take a construction Apprenticeship test, and will be paid at not less then the applicable equivalent Apprentice rate. With the approval of the Local Administrative Committee (LAC), experience in construction related areas may be accepted as meeting the above requirements.

SECTION 5. CROSS AND QUALIFIED REFERRALS

The Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions will exert their utmost efforts to recruit sufficient numbers of skilled and qualified craft employees to fulfill the requirements of the Contractor.

SECTION 6. UNION DUES/WORKING ASSESMENTS

All employees covered by this Agreement shall be subject to the union security provisions contained in the applicable Schedule A local agreements, as amended from time to time, but only for the period of time during which they are performing on-site Project work and only to the extent of rendering payment of the applicable union dues and assessments uniformly required for union membership in the Local Union, signatory to this Agreement, which represents the craft in which the employee is performing Project work. No employee shall be discriminated against at the Project site because of the employee's union membership or lack thereof. In the case of unaffiliated employees, the dues payment can be received by the Unions as a working assessment fee.

SECTION 7. CRAFT FOREPERSONS AND GENERAL FOREPERSONS
The selection of craft forepersons and/or general forepersons and the number of forepersons required shall be solely the responsibility of the Contractor except where otherwise provided by specific provisions of an applicable Schedule A. All forepersons shall take orders exclusively from the designated Contractor representatives. Craft foreperson shall be designated as working forepersons at the request of the Contractor, except when an existing local Collective Bargaining Agreement prohibits a foreperson from working when the craftsperson he is leading exceed a specified number.

ARTICLE 5 - UNION REPRESENTATION

SECTION 1. LOCAL UNION REPRESENTATIVE

Each Local Union representing on-site Project employees shall be entitled to designate in writing (copy to Contractors involved and Construction Management Firm) one representative, and the Business Manager, who shall be afforded access to the Project.

SECTION 2. STEWARDS

A. Each Local Union shall have the right to designate a working journey person as a Steward and an alternate, and shall notify the Contractor and the Construction Management firm of the identity of the designated Steward (and alternate) prior to the assumption of such duties. Stewards shall not exercise supervisory functions and will receive the regular rate of pay for their craft classifications. There will be no non-working Stewards on the Project.

B. In addition to their work as an employee, the Steward shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor. Each Steward shall be concerned with the employees of the Steward's Contractor and, if applicable, subcontractors of that Contractor, but not with the employees of any other Contractor. The Contractor will not discriminate against the Steward in the proper performance of Union duties.
C. The Stewards shall not have the right to determine when overtime shall be worked, or who shall work overtime, except pursuant to a Schedule A provision providing procedures for the equitable distribution of overtime.

SECTION 3. LAYOFF OF A STEWARD

Contractors agree to notify the appropriate Union 24 hours prior to the layoff of a Steward, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule A, such provisions shall be recognized to the extent the Steward possesses the necessary qualifications to perform the work required. In any case in which a Steward is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

ARTICLE 6 - MANAGEMENT'S RIGHTS

SECTION 1. RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their Project operations including, but not limited to: the right to direct the work force, including determination as to the number to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; or the discipline or discharge for just cause of its employees; the assignment and schedule of work; the promulgation of reasonable Project work rules; and, the requirement, timing and number of employees to be utilized for overtime work. No rules, customs, or practices, which limit or restrict productivity or efficiency of the individual, as determined by the Contractors, and/or joint working efforts with other employees shall be permitted or observed.

SECTION 2. MATERIALS, METHODS & EQUIPMENT

There shall be no limitations or restriction upon the Contractors' choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and
installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials, tool, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such work; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-out or testing of specialized or unusual equipment or facilities as designated by the Contractor. Notwithstanding the foregoing statement of contractor rights, prefabrication issues relating to work traditionally performed at the job site shall be governed pursuant to the terms of the applicable Schedule A. There shall be no restrictions as to work, which is performed off-site for the Project, except for work done in a fabrication center, tool yard, or batch plant dedicated exclusively to the performance of work on the Project, and located adjacent to the “site of work”.

ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS

SECTION 1. NO STRIKES-NO LOCKOUT

There shall not be strikes, sympathy strikes, picketing, work stoppages, slowdowns, hand billing, demonstrations or other disruptive activity at the Project for any reason by any Union or employee against any Contractor or employer while performing work at the Project. There shall be no other Union, or concerted or employee activity which disrupts or interferes with the operation of the existing free flow of traffic in the project area. Failure of any Union or employee to cross any picket line established by any union, signatory or non-signatory to this Agreement, or the picket or demonstration line of any other organization, at or in proximity to the Project site is a violation of this Article. There shall be no lockout at the Project by any signatory Contractor. Contractors and Unions shall take all steps necessary to ensure compliance with this Section 1 and to ensure uninterrupted construction and the free flow of traffic in the project area for the duration of this Agreement.

SECTION 2. DISCHARGE FOR VIOLATION
A Contractor may discharge any employee violating Section 1, above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 days.

SECTION 3. NOTIFICATION

If a Contractor contends that any Union has violated this Article, it will notify the appropriate College or area council of the Local Union involved advising of such fact, with copies of the notification to the Local Union and the BTC. The College or area council, and the BTC shall each instruct, order and otherwise use their best efforts to cause the employees, and/or the Local Unions to immediately cease and desist from any violation of this Article. A College or area council, or the BTC complying with these obligations shall not be liable for the unauthorized acts of a Local Union or its members.

SECTION 4. EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 1 of this Article may utilize the expedited procedure set forth below (in lieu of, or in addition to, any actions at law or equity) that may be brought.

A. A party invoking this procedure shall notify J.J. Pierson Jr, Esq., who shall serve as Arbitrator under this expedited arbitration procedure. Copies of such notification will be simultaneously sent to the alleged violator and, if a Local Union is alleged to be in violation, its International, the College, the Construction Manager, the BTC, and the Contractor involved.

B. The Arbitrator shall thereupon, after notice as to time and place to the Contractor and the Local Union involved, the BTC, and the Construction Manager, hold a hearing within 48 hours of receipt of the notice invoking the procedure it is contended that the violation still exists. The hearing will not, however, be scheduled for less than 24 hours after the notice to the College or area council required by Section 3 above.
C. All notices pursuant to this Article may be by telephone, telegraph, hand delivery, or fax, confirmed by overnight delivery, to the arbitrator, Contractor or Union involved. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session, which shall not exceed 8 hours duration (no more than 4 hours being allowed to either side to present their case, and conduct their cross examination) unless otherwise agreed. A failure of any Union or Contractor to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

D. The sole issue at the hearing shall be whether a violation of Section 1, above, occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease and Desist Award restraining such violation and serve copies on the Contractor and Union involved. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages, which issue is reserved solely for court proceedings, if any. The Award shall be issued in writing within 3 hours after the close of the hearing, and may be issued without an Opinion. If any involved party desires an Opinion, one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

E. An Award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of the Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to the Union or Contractor involved. In any court proceeding to obtain a temporary or preliminary order enforcing the arbitrator's Award as issued under this expedited procedure, the involved Union and Contractor waive their right to a hearing and agree that such proceedings may be ex parte, provided notice is given to opposing counsel. Such agreement does not waive any party's right to participate in a hearing for a final court order of enforcement or in any contempt proceeding.
F. Any rights created by statute or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.

G. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

SECTION 5. ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 1, above, may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8 - LOCAL ADMINISTRATIVE COMMITTEE (LAC)

SECTION 1. THE LOCAL ADMINISTRATIVE COMMITTEE WILL MEET ON A REGULAR BASIS TO:

1) Implement and oversee the Agreement procedures and initiatives; 2) monitor the effectiveness of the Agreement; and 3) identify opportunities to improve efficiency and work execution.

SECTION 2. COMPOSITION

The LAC will be co-chaired by the President of the Building Trades Council or his designee, and designated official of the College. It will be comprised of representatives of the local unions signatory to the project labor agreement (PLA) and representatives of the College’s Construction Management Firm and other contractors on the project.

ARTICLE 9 - GRIEVANCE & ARBITRATION PROCEDURE
SECTION 1. PROCEDURE FOR RESOLUTION OF GRIEVANCES

Any question, dispute or claim arising out of, or involving the interpretation or application of this Agreement (other than jurisdictional disputes or alleged violations of Article 7, Section 1) shall be considered a grievance and shall be resolved pursuant to the exclusive procedure of the steps described below; provided, in all cases, that the question, dispute or claim arose during the term of this Agreement.

Step 1:

A. When any employee covered by this Agreement feels aggrieved by a claimed violation of this Agreement, the employee shall, through the Local Union business representative or job steward give notice of the claimed violation to the work site representative of the involved Contractor. To be timely, such notice of the grievance must be given within 7 calendar days after the act, occurrence, or event giving rise to the grievance, or after the act, occurrence or event became known or should have become known to the Union. The business representative of the Local Union or the job steward and the work site representative of the involved Contractor shall meet and endeavor to adjust the matter within 7 calendar days after timely notice has been given. If they fail to resolve the matter within the prescribed period, the grieving party, may, within 7 calendar days thereafter, pursue Step 2 of they grievance procedure by serving the involved Contractor with written copies of the grievance setting forth a description of the claimed violation, the date on which the grievance occurred, the provisions of the Agreement alleged to have been violated. Grievances and disputes settled at Step 1 are non-precedential except as to the specific Local Union, employee and Contractor directly involved, unless the settlement is accepted in writing, by the Contractor, as creating a precedent.

B. Should any signatory to this Agreement have a dispute (excepting jurisdictional disputes or alleged violations of Article 7, Section 1) with any other signatory to this Agreement and, if
after conferring, a settlement is not reached within 7 calendar days, the dispute shall be reduced to writing and proceed to Step 2 in the same manner as outlined in subparagraph (a) for the adjustment of employee grievances.

Step 2:

The Business Manager or designee of the involved Local Union, together with representatives of the BTC and the involved Contractor, shall meet in Step 2 within 5 calendar days of the written grievance to arrive at a satisfactory settlement.

Step 3:

A. If the grievance shall have been submitted but not resolved in Step 2, any of the participating Step 2 entities may, within 14 calendar days after the initial Step 2 meeting, submit the grievance in writing (copies to other participants) to J.J. Pierson Jr., Esq., who shall act as the Arbitrator under this procedure. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union and employees and the fees and expenses of such arbitration's shall be borne equally by the involved Contractor and Local Union.

B. Failure of the grieving party to adhere to the time limits set forth in this Article shall render the grievance null and void. These time limits may be extended only by written consent of the involved Contractor and involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the issues presented to him and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

SECTION 2. LIMITATION AS TO RETROACTIVITY
No arbitration decision or award may provide retroactivity of any kind exceeding 30 calendar days prior to the date of service of the written grievance on the construction Project Manager and the involved Contractor or Local Union.

SECTION 3. PARTICIPATION BY GENERAL CONTRACTOR

The General Contractor shall be notified by the involved Contractor of all actions at Steps 2 and 3 and, at its election, may participate in full in all proceedings at these Steps, including Step 3 arbitration.

ARTICLE 10 - JURISDICTIONAL DISPUTES

SECTION 1. NO DISRUPTIONS

There will be no strikes, sympathy strikes, work stoppages, slowdowns, picketing or other disruptive activity of any kind arising out of any jurisdictional dispute. Pending the resolution of the dispute, the work shall continue uninterrupted and as assigned by the Contractor. No jurisdictional dispute shall excuse a violation of Article 7.

SECTION 2. ASSIGNMENT

A. There shall be a mandatory pre-job markup / assignment meeting prior to the commencement of any work. Attending such meeting shall be designated representatives of the Union signatories to this Agreement, the Construction Manager, and the involved Contractors. Best efforts will be made to schedule the pre-job meeting in a timely manner after Notice to Proceed is issued but not later than 30 days prior to the start of the Project.

B. All Project construction work assignments shall be made by the Contractor according to the criteria set forth in Section 3, Subsection D 1-3.

SECTION 3. PROCEDURE FOR SETTLEMENT OF DISPUTES
A. Any Union having a jurisdictional dispute with respect to Project work assigned to another Union will submit through its International the dispute in writing to the Administrator of the Plan within 72 hours and send a copy of the letter to the other Union involved, the Contractor involved, the General Contractor, the BTC, and the district or area councils of the unions involved. Upon receipt of a dispute letter from any union, the Administrator will invoke the procedures set forth in the Plan to resolve the jurisdictional dispute. The jurisdictional dispute letter shall contain the information described in Article IV of the Procedural Rules of the Plan.

B. Within 5 calendar days of receipt of the dispute letter, there shall be meeting of the General Contractor, the Contractor involved, the Local Unions involved and designees of the BTC and the district or area councils of the Local Unions involved for the purpose of resolving the jurisdictional dispute.

C. In order to expedite the resolution of jurisdictional disputes, the parties have agreed in advance to mutually select one of the following designated Arbitrators: Arbitrator J.J. Pierson, Arbitrator Paul Greenberg or Arbitrator Walter Kardy to hear all unresolved jurisdictional disputes arising under this Agreement. All other rules and procedures of the Plan shall be followed. If none of the three Arbitrators is available to hear the dispute within the time limits of the Plan, the Plan's arbitrator selection process shall be utilized to select another arbitrator.

SECTION 4. AWARD

Any award rendered pursuant to this Article and the Plan shall be final and binding on the disputing Local Unions and the involved Contractor on this Project only and may be enforced in accordance with the provisions of Article VII of the Plan. Any award rendered pursuant to the alternate procedures of this Article shall be final and binding on the disputing Local Unions and the involved Contractor on this Project only, and me be enforced in any court of competent jurisdiction.
Such award or resolution shall not establish a precedent on any other construction work not covered by this Agreement. In all disputes under this Article, the General Contractor and the involved Contractors shall be considered parties in interest.

SECTION 5. LIMITATIONS

The Arbitrator shall have no authority to assign work to a double crew, that is, to more employees than the minimum required by the Contractor to perform the work involved; nor to assign work to employees who are not qualified to perform the work involved; nor to assign work being performed by non-union employees to union employees. This does not prohibit the establishment, with the agreement of the involved Contractor, of composite crews where more than 1 employee is needed for the job. The aforesaid determinations shall decide only to whom the disputed work belongs.

SECTION 6. NO INTERFERENCE WITH WORK

A. There shall be no interference or interruption of any kind with the work of the Project while any jurisdictional dispute is being resolved. The work shall proceed as assigned by the Contractor until finally resolved under the applicable procedure of this Article. The award shall be confirmed in writing to the involved parties. There shall be no strike, work stoppage or interruption in protest of any such award. Any claims of a violation of this section shall be submitted and processed in accordance with the impediment to job progress provisions of the Plan.

B. In the event a Union alleged to have engaged in an impediment to job progress is an affiliate of a National or International Union that is not affiliated with the Building and Construction Trades Department and does not wish to have the impediment to job progress charge processed through the Plan, the parties to the dispute shall mutually select one of the three Arbitrators designated in this Article to hear the dispute. The selected Arbitrator shall schedule the hearing within
two business days from the date of submission. If he cannot hear the case within the required
timeframe, one of the other Arbitrators shall be selected by the parties to hear the case unless all parties
to the dispute agree to waive the two day time limit. The sole issue at the hearing shall be whether or
not a violation of this Section has in fact occurred, and the Arbitrator shall have not authority to
consider any matter in justification, explanation or mitigation of such violation or to award damages.
The Arbitrator’s decision shall be issued in writing within 3 hours after the close of the hearing, and
may be issued without an opinion. If any party desires an opinion, one shall be issued within 15 days,
but its issuance shall not delay compliance with, or enforcement of, the decision. The Arbitrator may
order cessation of the violation of this Section and other appropriate relief, and such decision shall be
served on all parties by facsimile upon issuance. Each party to the arbitration shall bear its own
expense for the arbitration and agrees that the fees and expenses of the Arbitrator shall be borne by the
losing party or parties as determined by the Arbitrator.

ARTICLE 11 - WAGES AND BENEFITS

SECTION 1. CLASSIFICATION AND BASE HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the work
performed and paid the base hourly wage rates for those classifications as specified in the attached
Schedules A, as amended during this Agreement. Recognizing, however, that special conditions may
exist or occur on the Project, the parties, by mutual agreement may establish rates and/or hours for one
or more classifications, which may differ from Schedules A. Parties to such agreements shall be the
Contractors involved, the involved Local Unions and the BTC.

SECTION 2. EMPLOYEE BENEFIT FUNDS

A. The Contractors agree to pay contributions on behalf of all employees covered
by this Agreement to the established employee benefit funds in the amounts designated in the
appropriate Schedule A; provided, however, that the Contractors and the Union agree that only such
bona fide employee benefits as are explicitly required under NJ Stat. § 34:11-56.30 of the New Jersey State Labor Law shall be included in this requirement and paid by the Contractor on this Project. Bona fide jointly trusted fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if similarly protected under NJ Stat. § 34:11-56.30.

Contractors shall not be required to contribute to non-NJ Stat. § 34:11-56.30 benefits, trusts or plans.

B. The Contractor agrees to be bound by the written terms of the legally established Trust Agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such Trust Funds but only with regard to work done on this Project and only for those employees to whom this Agreement requires such benefit Payments.

C. Should any contractor or sub-contractor become delinquent in the payment of contributions to the fringe benefit funds, then the subcontractor at the next higher tier, or upon notice of the delinquency claim from the Union or the Funds, agrees to withhold from the subcontractor such disputed amount from the next advance, or installment payment for work performed until the dispute has been resolved.

ARTICLE 12 - HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS

SECTION 1. WORK WEEK AND WORK DAY

A. The standard work week shall consist of 40 hours of work at straight time rates per one of the following schedules:

1. Five-Day Work Week: Monday-Friday, 5 days, 8 hours plus 1/2 hour unpaid lunch period each day.

2. Four-Day Work Week: Monday-Thursday; 4 days, 10 hours plus ½ hour unpaid lunch period each day.
B. The Day Shift shall commence between the hours of 6:00 a.m. and 9:00 a.m. and shall end between the hours of 2:30 p.m. and 7:30 p.m. Starting and quitting times shall occur at the employees' place of work as may be designated by the Contractor.

C. Scheduling - The Contractor shall have the option of scheduling either a five-day work week, or four-day work week (when mutually agreed upon on a craft-by-craft basis). The Contractor shall also have the option to set the work day hours consistent with Project requirements, the Project schedule, and minimization of interference with site operations traffic flow. When conditions beyond the control of the Contractor, such as severe weather, power failure, fire or natural disaster, prevent the performance of Project work on a regularly scheduled work day, the Contractor may, with mutual agreement of the Local Union on a craft-by-craft basis, schedule Friday (where on 4, 10's) during the calendar week in which a workday was lost, at straight time pay; providing the employees involved work a total of 40 hours or less during that work week.

D. Notice - Contractors shall provide not less than 5 days prior notice to the Local Union involved as to the work week and work hours schedules to be worked or such lesser notice as may be mutually agreed upon.

SECTION 2. OVERTIME

Overtime pay for hours outside of the standard work week and work day, described in paragraph A above, shall be paid in accordance with the applicable Schedule A. There will be no restriction upon the Contractor's scheduling of overtime or the non-discriminatory designation of employees who shall be worked, except as noted in Article 5, Section 2. There shall be no pyramiding of overtime pay under any circumstances. The Contractor shall have the right to schedule work so as to minimize overtime.

SECTION 3. SHIFTS
A. Flexible Schedules - Scheduling of shift work shall remain flexible in order to meet Project schedules and existing Project conditions including the minimization of interference with College operations. It is not necessary to work a day shift in order to schedule a second shift. Shifts must be worked a minimum of five consecutive work days, must have prior approval of the College and must be scheduled with not less than five work days notice to the Local Union.

B. Second/Shift - The second shift (starting between 2 p.m. and 8 p.m.) shall consist of 8 hours work (or 10 hours of work) for an equal number of hours pay at the straight time rate plus 15% in lieu of overtime and exclusive of a 1/2 hour unpaid lunch period.

C. Flexible Starting Times – Shift starting times will be adjusted by the Contractor as necessary to fulfill Project requirements subject to the notice requirements of Paragraph A.

D. Four Tens - When working a four-day work week, the standard work day shall consist of 10 hours work for 10 hours of pay at the straight time rate exclusive of an unpaid 1/2 hour meal period and regardless of the starting time. This provision is applicable to night shifts only, and such night shifts are subject to the shift differential in paragraph B above.

E. It is agreed that when project circumstances require a deviation form the above shifts, the involved unions and Contractors shall adjust the starting times of the above shifts or establish shifts which meet the project requirements. It is agreed that neither party will unreasonably withhold their agreement.
SECTION 4. HOLIDAYS

A. Schedule - There shall be 8 recognized holidays on the Project:

New Years Day          Labor Day
Presidents Day          Veterans Day
Memorial Day            Thanksgiving Day
Fourth of July          Christmas Day

*Work shall be scheduled on Good Friday pursuant to the craft’s Schedule A.

All said holidays shall be observed on the dates designated by New Jersey State Law. In the absence of such designations, they shall be observed on the calendar date except those holidays which occur on Sunday shall be observed on the following Monday. Holidays falling on Saturday are to be observed on the preceding Friday.

B. Payment - Regular holiday pay, if any, and/or premium pay for work performed on such a recognized holiday shall be in accordance with the applicable Schedule A.

C. Exclusivity - No holidays other than those listed in Section 4-A above shall be recognized nor observed except in Presidential Election years when Election Day is a recognized holiday.

SECTION 5. REPORTING PAY

A. Employees who report to the work location pursuant to regular schedule and who are not provided with work or whose work is terminated early by a Contractor, for whatever reason, shall receive minimum reporting pay in accordance with the applicable Schedule A.

B. When an employee, who has completed their scheduled shift and left The Project site, is "called back" to perform special work of a casual, incidental or irregular nature, the
employee shall receive pay for actual hours worked with a minimum guarantee, as may be required by the applicable Schedule A.

C. When an employee leaves the job or work location of their own volition or is discharged for cause or is not working as a result of the Contractor's invocation of Section 7 below, they shall be paid only for the actual time worked.

D. Except as specifically set forth in this Article there shall be no premiums, bonuses, hazardous duty, high time or other special payments of any kind.

E. There shall be no pay for time not actually worked except as specifically set forth in this Agreement and except where an applicable Schedule A requires a full weeks pay for forepersons.

SECTION 6. PAYMENT OF WAGES

A. Payday - Payment shall be made by check, drawn on a New Jersey bank with branches located within commuting distance of the job site. Paychecks shall be issued by the Contractor at the job site by 10 a.m. on Thursdays. In the event that the following Friday is a bank holiday, paychecks shall be issued on Wednesday of that week. Not more than 3 days wages shall be held back in any pay period. Paycheck stubs shall contain the name and business address of the Contractor, together with an itemization of deductions from gross wages.

B. Termination-Employees who are laid-off or discharged for cause shall be paid in full for that which is due them at the time of termination. The Contractors shall also provide the employee with a written statement setting forth the date of lay off or discharge.

SECTION 7. EMERGENCY WORK SUSPENSION
A Contractor may, if considered necessary for the protection of life and/or safety of employees or others, suspend all or a portion of Project Work. In such instances, employees will be paid for actual time worked; provided, however, that when a Contractor request that employees remain at the job site available for work, employees will be paid for "stand-by" time at their hourly rate of pay.

SECTION 8. INJURY/DISABILITY

An employee who, after commencing work, suffers a work-related injury or disability while performing work duties, shall receive no less than 8 hours wages for that day. Further, the employee shall berehired at such time as able to return to duties provided there is still work available on the Project for which the employee is qualified and able to perform.

SECTION 9. TIME KEEPING

A Contractor may utilize brassing or other systems to check employees in and out. Each employee must check in and out. The Contractor will provide adequate facilities for checking in and out in an expeditious manner.

SECTION 10. MEAL PERIOD

A Contractor shall schedule an unpaid period of not more than 1/2 hour duration at the work location between the 3rd and 5th hour of the scheduled shift. A Contractor may, for efficiency of operation, establish a schedule which coordinates the meal periods of two or more crafts. If an employee is required to work through the meal period, the employee shall be compensated in a manner established in the applicable Schedule A.

SECTION 11. BREAK PERIODS

There will be no rest periods, organized coffee breaks or other non-working time established during working hours. Individual coffee containers will be permitted at the employees' work location. Local area practice will prevail for coffee breaks that are not organized.
ARTICLE 13 - APPRENTICES

SECTION 1. RATIOS

Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women and economically disadvantaged non-minority males, Contractors will employ apprentices in their respective crafts to perform such work as is within their capabilities and which is customarily performed by the craft in which they are indentured. Contractors may utilize apprentices and such other appropriate classifications as are contained in the applicable Schedule A in a ratio not to exceed 25% of the work force by craft (without regard to whether a lesser ratio is set forth in Schedule A), unless the applicable Schedules A provide for a higher percentage. Apprentices and such other classifications as are appropriate shall be employed in a manner consistent with the provisions of the appropriate Schedule A.

SECTION 2. DEPARTMENT OF LABOR

To assist the Contractors in attaining a maximum effort on this Project, the Unions agree to work in close cooperation with, and accept monitoring by, the New Jersey State and Federal Departments of Labor to ensure that minorities, women, or economically disadvantaged are afforded opportunities to participate in apprenticeship programs which result in the placement of apprentices on this Project. To further ensure that this Contractor effort is attained, up to 50% of the apprentices placed on this Project should be first year, minority, women or economically disadvantaged apprentices. The Local Unions will cooperate with Contractor request for minority, women or economically disadvantaged referrals to meet this Contractor effort.
ARTICLE 14 - SAFETY PROTECTION OF PERSON AND PROPERTY

SECTION 1. SAFETY REQUIREMENTS

The General Contractor is the primary responsible party for on-site safety. Each contractor will ensure that applicable OSHA requirements and other requirements set forth in the contract documents are at all times maintained on the Project and the employees and Unions agree to cooperate fully with these efforts. Employees must perform their work at all times in a safe manner and protect themselves and the property of the Contractor and the Owner from injury or harm. Failure to do so will be grounds for discipline, including discharge.

SECTION 2. CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the Gloucester County College Policy for safety, security, and visitor rules. Additionally job specific rules as established by the Contractors and the Construction Manager for this Project shall also apply. Such rules will be published and posted in conspicuous places throughout the Project.

SECTION 3. INSPECTIONS

The Contractors, College, Architect and Construction Manager retain the right to inspect incoming shipments of equipment, apparatus, machinery and construction materials of every kind.

ARTICLE 15 - NO DISCRIMINATION

SECTION 1. COOPERATIVE EFFORTS

The Contractors and Unions agree that they will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin or age in any manner prohibited by law or regulation. It is recognized that special procedures maybe established by Contractors and Local Unions and the New Jersey State Department of Labor for the training and employment of persons who have not previously qualified to be employed on construction projects of
the type covered by this Agreement. The parties to this Agreement will assist in such programs and agree to use their best efforts to ensure that the goals for female and minority employment are met on this Project.

SECTION 2. LANGUAGE OF AGREEMENT

The use of the masculine or feminine gender in this Agreement shall be construed as including both genders.

ARTICLE 16 - GENERAL TERMS

SECTION 1. PROJECT RULES

The Project Management Firm and the Contractors shall establish such reasonable Project rules as are appropriate for the good order of the Project, provided they do not violate the terms of this agreement. These rules will be explained at the pre-job conference and posted at the Project site and may be amended thereafter as necessary. Failure of an employee to observe these rules and regulations shall be grounds for discipline, including discharge. The fact that no order was posted prohibiting a certain type of misconduct shall not be a defense to an employee disciplined or discharged for such misconduct when the action taken is for cause.

SECTION 2. TOOLS OF THE TRADES

The welding/cutting torch and chain fall, are tools of the trade having jurisdiction over the work performed. Employees using these tools shall perform any of the work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee or on the use of any tools or equipment for the performance of work within the employee's jurisdiction.

SECTION 3. SUPERVISION

Employees shall work under the supervision of the craft foreperson or general foreperson.
SECTION 4. TRAVEL ALLOWANCES

There shall be no payments for travel expenses, travel time, subsistence allowance or other such reimbursements or special pay except as expressly set forth in this Agreement and in Schedule A limited to travel expenses.

SECTION 5. FULL WORK DAY

Employees shall be at their staging area at the starting time established by the Contractor and shall be returned to their staging area by quitting time after performing their assigned functions under the supervision of the Contractor. The signatories reaffirm their policy of a fair day's work for a fair day's wage.

SECTION 6. COOPERATION

The Owner, Contractors and the Unions will cooperate in seeking any NJ Department of Labor approvals that may be required for implementation of any terms of this Agreement.

ARTICLE 17 - SAVINGS AND SEPARABILITY

SECTION 1. THIS AGREEMENT

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law, the provision involved shall be rendered, temporarily or permanently, null and void but the remainder of the Agreement shall remain in full force and effect. In such event, the Agreement shall remain in effect for contracts already bid and awarded or in construction where the Contractor voluntarily accepts the Agreement. The parties to this Agreement will enter into negotiations for a substitute provision in conformity with the law and the intent of the parties for contracts to be let in the future.
SECTION 2. THE BID SPECIFICATIONS

In the event that the Contractors’ bid specifications, or other action, requiring that a successful bidder become signatory to this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law such requirement shall be rendered, temporarily or permanently, null and void but the Agreement shall remain in full force and effect to the extent allowed by law. In such event, the Agreement shall remain in effect for contracts already bid and awarded or in constructions where the Contractor voluntarily accepts the Agreement. The parties will enter in to negotiations as to modifications to the Agreement to reflect the court action taken and the intent of the parties for contracts to be let in the future.

SECTION 3. NON-LIABILITY

In the event of an occurrence referenced in Section 1 or Section 2 of this Article, neither the Owner, the Architect, the Engineers, the Construction Manager, or any Contractor, or any signatory Union shall be liable, directly or indirectly, for any action taken, or not taken, to comply with any court order, injunction or determination. Project bid specifications will be issued in conformance with court orders in effect and no retroactive payments or other action will be required if the original court determination is ultimately reversed.

SECTION 4. NON-WAIVER

Nothing in this Article shall be construed as waiving the prohibitions of Article 7 as to signatory Contractors and signatory Unions.

ARTICLE 18 - HELMETS TO HARDHATS

SECTION 1.

The Employees and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry.
The Employees and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter “Center”) and the Center’s “Helmets to Hardharts” program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support network, employment opportunities and other needs as identified by the parties.

SECTION 2.

The Unions and Employers agree to coordinate with the Center to create and maintain an integrated database of veterans interested in working on this Project and of apprenticeship and employment opportunities for this Project. To the extent permitted by law, the Unions will give credit to such veterans for bona fide, provable past experience.

ARTICLE 19 - FUTURE CHANGES IN SCHEDULE A AREA CONTRACTS

SECTION 1. CHANGES TO AREA CONTRACTS

A. Schedules A to this Agreement shall continue to full force and effect until the Contractor and/or Union parties to the Area Collective Bargaining Agreements which are the basis for Schedules A notify the Contractors in writing of the mutually agreed upon changes in provisions of such agreements which are applicable to the Project, and their effective dates.

B. It is agreed that any provisions negotiated into Schedules A collective bargaining agreements will not apply to work on this Project if such provisions are less favorable to this Project than those uniformly required of contractors for construction work normally covered by those agreements; nor shall any provisions be recognized or applied on this Project if it may be construed to apply exclusively, or predominantly, to work covered by this Project Agreement.
C. Any disagreement between signatories to this Agreement over the incorporation into Schedules "A" of provisions agreed upon in the renegotiations of Area Collective Bargaining Agreements shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

SECTION 2. LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there will be no strikes, work stoppages, sympathy actions, picketing, slowdowns or other disruptive activity or other violations of Article 7 affecting the Project by any Local Union involved in the renegotiations of Area Local Collective Bargaining Agreements nor shall there by any lock-out on the Project affecting a Local Union during the course of such renegotiations.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed and effective as of the _____________ day of _____________, 20__.

ROWAN COLLEGE AT GLOUCESTER COUNTY

______________________________

UNITED BUILDING TRADES COUNCIL
OF SOUTHERN NEW JERSEY

By: ___________________________________________________________________
    Dan Cosner, President

Asbestos Workers #14
Bricklayers #2

Bricklayers #5

Carpenters #393

Cement Masons #592

Electrical Workers #351

Glazier #225

Laborers #172

Laborers #222

Operating Engineers #825

Painters #711

Plasterers #8

Plumbers/Pipe Fitters #322
Roofers #30

Sheet Metal Workers #19

Signmakers #194

Sprinkler #692

Teamsters #676

Tile, Marble #7
ARTICLE 20 - LETTER OF ASSENT

PROJECT LABOR AGREEMENT

The undersigned, as a Prime Contractor or Subcontractor on a Contract which is part of the

____________________________________ (Project) for and in consideration of the award of a
(Name of Project)
Contract to perform work on said Project, and in further consideration of the mutual promises made in
the Project Labor Agreement, a copy of which was received and is acknowledged, hereby:

(1) On behalf of itself and all its employees, accepts and agrees to be bound by terms and
conditions of the Project Labor Agreement, together with any and all amendments and
supplements now existing or which are later made thereto, and understands that any act of
non-compliance with all such terms and conditions, including but not limited to, evidence
of compliance with the pre-employment controlled substance testing, will subject the non-
complying Contractor or employee(s) to being prohibited from the Project Site until full
compliance is obtained.

(2) Certified that it has no commitments or agreements, which would preclude its full
compliance with the terms and conditions of said Project Labor Agreement.

(3) Agrees to secure from any Contractor(s) (as defined in said Project Labor Agreement)
which is or becomes a Subcontractor(s) (of any tier), a duly executed Letter of Assent in
form identical to this document prior to commencement of any work.

Dated: __________________________________________

__________________________
Name of Contractor/Company

__________________________
Signature of Authorized Representative

__________________________
Print Name and Title

__________________________
Contract Number
SECTION 01010 - SUMMARY OF WORK

1.1 GENERAL

A. The Project consists of two (2) new freestanding Buildings and associated Site Work including Parking, Stormwater Management and Utilities. The Buildings are the Economic Development Center and Rowan Medicine at Rowan College at Gloucester County, 1400 Tanyard Road, Sewell, New Jersey 08080.

1. Owner: Rowan College at Gloucester County, 1400 Tanyard Road, Sewell, New Jersey 08080.

B. Contract Documents were prepared for the Project by Garrison Architects, 713 Creek Road, Bellmawr, NJ 08031

C. The Work consists of one (1) Lump Sum Contract for all work in the construction documents for the two (2) new freestanding Buildings and associated Site Work including Parking, Stormwater Management and Utilities.

1. The Contractors are strongly encouraged to verify all existing condition, dimensions and areas prior to submitting a responsive / responsible bid. Such site visit shall be for familiarizing the Contractor with the conditions as they exist and the character of the operations to be carried on under the Contract Documents, including all existing site conditions, access to the site, physical characteristics of the site and surrounding areas. Site visits can be arranged through the Construction Manager, Jim Lauria of GREYHAWK, cell phone number is (609) 273-4579, email jlauria@greyhawk.com or Jay Appleton of GREYAHWK, cell phone number (609) 504-5985, email jappleton@greyhawk.com.

2. The Rowan Medicine Building is an approximately 56,545 SF two-story steel frame building and includes, but is not limited to the following (see drawings for more information):

   a. The first floor includes: Four (4) outpatient medical clinics including Family Medicine, OMM / NMI / Pain Management, MHID (Mental Health), and Pediatrics; Lobby Café Area and a Physical Therapy Suite
   b. The second floor includes: Rowan University College of Osteopathic Medicine for one hundred (144) students and the Dean of Academics Offices.
   c. Toilet Rooms, Janitor’s Closet, Storage, Electrical and IT Rooms
   d. All structural and steel work
   e. All plumbing work, Fire and sprinkler system
   f. Nurse’s call system
   g. All HVAC work (BMS Controls by Tozour Trane / Owner (see paragraph 4 for a full list of equipment)
   h. All electrical work (fire alarm work by the Owner) (see paragraph 4 for a full list of equipment)
   i. All site work, walkways, utilities, paving, grading, water, gas, sewer, storm, and landscaping work
   j. Security System (by the Owner) (see paragraph 4 for a full list of equipment)
   k. All site utility modifications
SECTION 01010 - SUMMARY OF WORK

1. Outdoor standby natural gas generator
2. IT Systems wiring
3. This Contractor shall provide Roof Inspection Services

3. The Economic Development Center is an approximately 15,633 one-story steel frame building and includes, but is not limited to the following (see drawings for more information):

a. New Jersey Department of Labor and Workforce Development, the Gloucester County Chamber of Commerce, and the Gloucester County Economic Development Office area
b. Toilet Rooms, Janitor’s Closet, Storage, Electrical and IT Rooms
c. All structural and steel work
d. All plumbing work, fire and sprinkler system
e. All HVAC work (BMS Controls by Tozour Trane / Owner) (see paragraph 4 for a full list of equipment)
f. All electrical work (fire alarm work by the Owner) (see paragraph 4 for a full list of equipment)
g. All site work, walkways, paving, utilities, grading, water, gas, sewer, storm, and landscaping work
h. All site utility modifications
i. Outdoor standby natural gas generator
j. IT Systems wiring
k. This Contractor shall provide Roof Inspection Services

4. List of equipment supplied by Owner via Tozour Trane and installed by Contractor:

a. Mechanical Equipment:
   • Rooftop Units
   • Ductless Split System Units
   • VAV Boxes
   • Electric Heaters

   Controls (Tozour Trane) are to be provided by the Owner, including all programming.

   Instructions on system by Contractor, in conjunction with Tozour Trane.

b. Electrical Equipment

   • All equipment, devices, wiring and other work shown on electrical drawings is by this contractor, except as follows (or as specifically indicated otherwise on the drawings).

   • Telephone and data system shall be furnished and installed by this contractor, including wiring, jacks, cover plates, patch panels, punch-down blocks, and final connections. Actual purchase of telephones shall be by owner.
SECTION 01010 - SUMMARY OF WORK

- Audio/visual systems and wiring shall be furnished and installed by the owner's audio/visual vendor (under a separate contract direct with the owner). Pathways to facilitate audio/visual work is by this contractor as shown on the drawings.

- Security/access/intrusion/CCTV system equipment, devices, and final connections shall be furnished and installed by the owner's systems vendor (under a separate contract direct with the owner). Wiring for door releases, card readers, and cameras is by this contractor as shown on the drawings. Pathways to facilitate security work is by this contractor as shown on the drawings.

- Paging system equipment, devices, and final connections shall be furnished and installed by the owner's systems vendor (under a separate contract direct with the owner). Pathways and wiring for paging speakers and volume controls is by this contractor as shown on the drawings.

- Fire alarm system equipment, devices, wiring, and final connections shall be furnished and installed by the owner's fire alarm vendor (under a separate contract direct with the owner). Pathways to facilitate fire alarm work is by this contractor as shown on the drawings. Fire alarm performance specifications (specifications section 16501) are included for reference only.

D. Schedule of work sequence:

1. No work can be started until all permits are received. The existing college must be completely operational during the school year. The final phase of the project must be completed on or before January 29, 2021.
2. Campus electrical power and other utility shut downs must be conducted on a weekend for minimum impact to the college.
3. Any road closures must be conducted on a weekend for minimal impact to local and College traffic. The Contractor is responsible for local Police and Traffic Safety during any road closures.

E. Phasing:

1. Phase 1: Site work.
   - Provide safety plan and site fencing.
   - Provide and install Soil Erosion and GCC Soil Control Measures
   - Provide Construction Manager’s trailer, Contractors’ trailers and a temporary parking area
   - Install ALL site underground conduit and utilities according to site and electrical drawings.
   - Construct both building pads to the slab on grade.
   - Construct and provide the base paving for all of the paved surfaces as shown on the contract documents. Work above the slab on grade is prohibited until the base paving is complete for all areas.
2. Phase 2: Construction of the buildings from the slab on grade up. The Economic Development Center shall be complete by August 28, 2020. On August 28, 2020 the Contractor shall provide complete finished asphalt paving for 200 parking spaces and the main entrance adjacent to the building. The temporary fencing shall be relocated accordingly and as approved by the Owner.

3. Phase 3: Completion of all work on or before January 29, 2021.

F. The Work will be constructed under one lump sum prime contract.

G. Separate Contract: The Owner may award a separate contract for construction operations that may be conducted simultaneously with work under this Contract. That Contract may include the following:

1. Contract: A separate contract may be awarded for security, loose furniture, telephone, television and computer data systems. The separate contract work only includes connections and equipment. The conduits and wall boxes to the control panels shall be included in the contractor’s work.

H. Cooperate with separate contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

I. Future Contracts: The Owner may award separate contracts for work to be performed following Substantial Completion. Completion of that work depends on completion of work under this Contract. The schedule of this work will be coordinated with the contractor to assure the smooth, successful completion of the project.

J. Contractor Use of Premises: During construction the Contractor shall have full use of the premises and use of the site inside the construction limit fence. The Contractor's use of premises is limited only by the Owner's right to perform work or employ other contractors on portions of the Project. Any time there is a necessity to enter the other existing buildings, the contractors shall coordinate with the Owner’s on site representative. No unauthorized entry will be permitted. The contractors may work in the existing mechanical room direct access from exterior door of the mechanical room.

K. Use of the Site: Limit use of premises to areas indicated inside of the construction limit fence. Do not disturb portions of the site beyond the areas indicated. Areas which will be disturbed shall also be fenced in during construction. All times during the school day, the construction traffic will operate with extra precaution to avoid conflict with school operations and public traffic.

1. Allow for Owner occupancy and use by the public. Provide safety barriers for students, faculty and the public.
2. Keep driveways and entrances clear. Do not use these areas for parking or material storage. Schedule deliveries to minimize on-site storage of materials and equipment. All deliveries should access the site from Tanyard Road.
3. All construction vehicles should park inside the construction fence and not in student or public parking areas.
SECTION 01010 - SUMMARY OF WORK

L. Full Owner Occupancy: The Owner will occupy campus during construction. Cooperate with the Owner to minimize conflicts and facilitate Owner usage. Do not interfere with the Owner's operations.

M. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion. Placing equipment and partial occupancy do not constitute acceptance of the Work.

1. The Architect will prepare a Certificate of Substantial Completion after the Contractor obtains a Certificate of Occupancy from Building Officials for each portion of Work occupied prior to Owner occupancy.

2. Mechanical and electrical systems shall be operational and required inspections and tests completed prior to partial Owner occupancy. Upon occupancy, the Owner will operate and maintain systems serving occupied portions of the building.

3. The Owner will be responsible for maintenance and custodial service for occupied portions of the building.

N. Owner-Furnished Products: The Owner may furnish some Mechanical Equipment, Electrical Equipment, security, telephone, television, and computer data systems. The Work includes providing support systems to receive Owner's equipment, and mechanical and electrical connections.

1. The Owner will arrange for and deliver shop drawings, product data, and samples to the Contractor.

2. The Owner will arrange and pay for delivery according to the Contractor's Construction Schedule.

3. The Owner will inspect items delivered for damage.

4. If items are damaged, defective, or missing, the Owner will arrange for replacement.

5. The Owner will arrange for field services and for the delivery of warranties to the Contractor.

6. The Contractor shall designate delivery dates in the Contractor's Construction Schedule.

7. The Contractor shall review shop drawings, product data, and samples and return them noting discrepancies or problems anticipated in using the product.

8. The Contractor is responsible for receiving, unloading, and handling Owner-furnished items at the site.

9. The Contractor is responsible for protecting items from damage, including exposure to the elements. The Contractor shall repair or replace items damaged as a result of his operations.

O. Fees, Permits and Taxes: The Contractor is advised that a Building Permit is required for this project. The plans have been submitted to the Construction Official. Upon contract award, it shall be the responsibility of the Contractor to secure all required permits. It shall be the Owner's responsibility to pay for the permit review fee. It shall be the Contractor's responsibility to pay for all fees and permit costs.
SECTION 01010 - SUMMARY OF WORK

P. SAFETY: The Contractor is responsible to provide and enforce all safety onsite and conform with all OSHA regulations, codes and standards. The Owner, Construction Manager, Clerk of the Works and Architect have no responsibility to provide for the safety or protection of the trades. The Contractor shall submit a site specific Emergency Action Safety Plan and review this with all onsite personnel. The Contractor shall conduct periodic (as needed at least one a month) site safety inspections and issue a report on the conditions. The Contractor shall maintain a first aid kit onsite.

1.2 PRODUCTS

A. The contractor shall not use any product containing asbestos. As part of the “The Final Payment Checklist Documents” the contractor shall provide a notarized letter that no asbestos containing materials were provided on the project.

B. The Contractor is required to purchase all long lead items within (45) days of the award of the contract. The Owner will pay for stored material in accordance with the General Conditions. Delays caused by the failure of the Contractor to adhere to this requirement will not be cause for a time extension. **NO TIME EXTENSIONS WILL BE GRANTED!**

END OF SECTION 01010
SECTION 01040 – COORDINATION

1.1 GENERAL

A. This Section includes requirements for coordinating construction operations including, but not necessarily limited to, the following:

1. Coordination drawings and Specifications with all subcontractors.
2. Administrative and supervisory personnel.
3. Cleaning and protection is the responsibility of the Contractor.

1.2 COORDINATION

A. Coordinate construction to assure efficient and orderly installation of each part of the Work. Coordinate operations that depend on each subcontractor for proper installation, connection, and operation. The Contractor shall be responsible for the following:

1. Schedule operations in the sequence required to obtain the best results where installation of one part depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to assure maximum accessibility for maintenance, service, and repair.
3. Make provisions to accommodate items scheduled for later installation.
4. Coordination with the school for furniture and equipment which shall be relocated to new facilities.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and his contractors where coordination of their work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required procedures with other activities to avoid conflicts and assure orderly progress. Such activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Delivery and processing of submittals.
3. Progress meetings.
4. Project closeout activities.

D. Conservation: Coordinate construction to assure that operations are carried out with consideration for conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not incorporated in, the Work.

E. Coordination Drawings: Prepare coordination drawings for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space necessitates maximum utilization of space for efficient installation of different components.

COORDINATION

01040 - 1
SECTION 01040 – COORDINATION

1. Show the relationship of components shown on separate shop drawings.
2. Indicate required installation sequences.
3. Comply with requirements contained in Section "Submittals."

F. Staff Names: The Contractor shall Within 7 days of commencement of construction, submit a list of the Contractor's staff assignments, including the superintendent and other personnel at each Project Site. Identify individuals and their responsibilities. List their addresses and telephone numbers.

   1. Post copies in the Project meeting room, the temporary field office, and each temporary telephone.

1.3 PRODUCTS (Not Applicable)

1.4 EXECUTION

A. Inspection of Conditions: Require Installers of major components to inspect substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.

B. Coordinate temporary enclosures with inspections and tests to minimize the need to uncover completed construction.

C. Clean and protect construction in progress and adjoining materials, during handling and installation. Apply protective covering to assure protection from damage.

D. Clean and maintain completed construction as necessary through the construction period. Adjust and lubricate operable components to assure operability without damaging effects.

E. Limiting Exposures: Supervise construction to assure that no part is subject to harmful, dangerous, or damaging exposure. Such exposures include, but are not limited to, the following:

   1. Excessive static or dynamic loading.
   2. Excessive internal or external pressures.
   3. Excessively high or low temperatures.
   4. Water or ice.
   5. Solvents and chemicals.
   6. Abrasion.
   7. Soiling, staining, and corrosion.
   9. Excessive dust.

END OF SECTION 01040
SECTION 01050 - FIELD ENGINEERING

1.1 GENERAL

A. This Section specifies requirements for field-engineering services including, but not limited to, the following:

1. Civil-engineering services.
2. Geotechnical: Conduct monitoring, testing and inspection work during construction.
3. Surveying.

B. Submit a certificate certifying location and elevation of improvements.

C. Project Record Documents: Submit a record of Work performed and record survey data.

1.2 PRODUCTS (Not Applicable)

1.3 EXECUTION

A. Verify layout information, in relation to property survey and existing benchmarks, before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

1. Do not change or relocate benchmarks or control points without written approval. Report destroyed reference points or requirements to relocate reference points because of changes in grades.
2. Replace destroyed Project control points. Base replacements on the original survey control points.

B. Establish and maintain a minimum of 2 permanent benchmarks.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

C. Existing Utilities: The existence of underground utilities and construction is not guaranteed. Verify location of underground utilities and other construction before beginning sitework.

1. Prior to construction, verify location and invert elevation at points of connection of sanitary and storm sewers, and water-service piping.

D. Work from lines and levels established by the property survey. Establish benchmarks and markers to set lines and levels at each story of construction and to locate each element. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.

1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
2. As construction proceeds, check every element for line, level, and plumb.

E. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log available for reference.
SECTION 01050 - FIELD ENGINEERING

1. Record deviations from lines and levels. Advise the Architect when deviations exceed tolerances. On Project Record Drawings, record deviations that are accepted and not corrected.

2. On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

F. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations.

G. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels, and control lines and levels required for mechanical and electrical work.

H. Existing Utilities: Furnish information necessary to adjust, move, or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction.

END OF SECTION 01050
SECTION 01095 - REFERENCE STANDARDS AND DEFINITIONS

1.1 GENERAL

A. Definitions: Basic Contract definitions are included in the Conditions of the Contract.

B. Indicated refers to graphic representations, notes, or schedules on the Drawings, paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as shown, noted, scheduled, and specified are used to help the reader locate the reference. Location is not limited.

C. Directed, requested, authorized, selected, approved, required, and permitted mean directed by the Architect, requested by the Architect, and similar phrases.

D. Approved, when used in conjunction with the Architect's action on submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.

E. Regulations include laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. Install describes operations at the Project Site including unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. Provide means to furnish and install, complete and ready for the intended use.

I. Installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term experienced, when used with the term Installer, means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authorities having jurisdiction.

J. Project Site is the space available for performing construction activities, either exclusively or in conjunction, with others performing work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

K. Testing Agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

L. Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16-Division format and MASTERFORMAT numbering system.
SECTION 01095 - REFERENCE STANDARDS AND DEFINITIONS

1. Abbreviated Language: Language used in Specifications is abbreviated. Implied words and meanings shall be interpreted as appropriate. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative and streamlined language is used. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.

a. The words "shall be" are implied where a colon (:) is used within a sentence or phrase.

M. Abbreviations and Names: Where acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

AA    Aluminum Association  
900 19th St., NW, Suite 300 
Washington, DC 20006  
(202) 862-5156

AAMA  American Architectural Manufacturers Assoc.  
1540 E. Dundee Road, Suite 310  
Palatine, IL 60067  
(708) 202-1350

ACI    American Concrete Institute  
P.O. Box 19150  
Detroit, MI 48219-0150  
(313) 532-2600

ACIL   American Council of Independent Laboratories  
1725 K St., NW, Suite 412  
Washington, DC 20006  
(202) 887-5872

ADC    Air Diffusion Council  
One Illinois Center, Suite 200  
111 East Wacker Drive  
Chicago, IL 60601  
(312) 616-0800

AGA    American Gas Assoc.  
1515 Wilson Blvd.  
Arlington, VA 22209  
(703) 841-8400
SECTION 01095 - REFERENCE STANDARDS AND DEFINITIONS

AIA  American Institute of Architects
     1735 New York Ave., NW
     Washington, DC 20006
     (202) 626-7300

A.I.A.  American Insurance Assoc.
        1130 Connecticut Ave., NW, Suite 1000
        Washington, DC 20036
        (202) 828-7100

AISC  American Institute of Steel Construction
      One East Wacker Drive, Suite 3100
      Chicago, IL 60601-2001
      (312) 670-2400

AISI  American Iron and Steel Institute
      1101 17th Street, NW, Suite 1300
      Washington, DC 20036
      (202) 452-7100

AMCA  Air Movement and Control Assoc.
      30 W. University Drive
      Arlington Heights, IL 60004
      (708) 394-0150

ANSI  American National Standards Institute
      11 West 42nd Street, 13th Floor
      New York, NY 10036
      (212) 642-3300

APA  American Plywood Assoc.
     P.O. Box 11700
     Tacoma, WA 98411
     (206) 565-6600

ARI  Air Conditioning and Refrigeration Institute
     1501 Wilson Blvd., 6th Floor
     Arlington, VA 22209
     (703) 524-8800

ASC  Adhesive and Sealant Council
     1627 K Street, NW, Suite 1000
     Washington, DC 20006
     (202) 452-1500

ASHRAE  American Society of Heating, Refrigerating
         and Air-Conditioning Engineers
        1791 Tullie Circle, NE
        Atlanta, GA 30329
        (404) 636-8400
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers 345 East 47th St. New York, NY 10017 (212) 705-7722</td>
</tr>
<tr>
<td>ASPE</td>
<td>American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362 (805) 495-7120</td>
</tr>
<tr>
<td>ASSE</td>
<td>American Society of Sanitary Engineering P.O. Box 40362 Bay Village, OH 44140 (216) 835-3040</td>
</tr>
<tr>
<td>AWI</td>
<td>Architectural Woodwork Institute P.O. Box 1550 13924 Braddock Rd., Suite 100 Centreville, VA 22020 (703) 222-1100</td>
</tr>
<tr>
<td>AWPA</td>
<td>American Wood Preservers' Assoc. P.O. Box 849 Stevensville, MD 21666 (301) 643-4163</td>
</tr>
<tr>
<td>AWPB</td>
<td>American Wood Preservers Bureau P.O. Box 5283 Springfield, VA 22150 (703) 339-6660</td>
</tr>
<tr>
<td>AWS</td>
<td>American Welding Society 550 LeJeune Road, NW P.O. Box 351040 Miami, FL 33135 (305) 443-9353</td>
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<td>AWWA</td>
<td>American Water Works Assoc. 6666 W. Quincy Ave. Denver, CO 80235 (303) 794-7711</td>
</tr>
<tr>
<td>BHMA</td>
<td>Builders' Hardware Manufacturers Assoc. 355 Lexington Ave., 17th Floor New York, NY 10017 (212) 661-4261</td>
</tr>
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<td>Acronym</td>
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<tr>
<td>BIA</td>
<td>Brick Institute of America</td>
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<tr>
<td>BOCA</td>
<td>Building Officials and Code Administrators International</td>
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<tr>
<td>CDA</td>
<td>Copper Development Assoc.</td>
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<tr>
<td>CISPI</td>
<td>Cast Iron Soil Pipe Institute</td>
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<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
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<tr>
<td>CS</td>
<td>Commercial Standard of NBS (U.S. Department of Commerce) Governmental Printing Office; Washington, DC 20402</td>
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<tr>
<td>DHI</td>
<td>Door and Hardware Institute</td>
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<tr>
<td>EIA</td>
<td>Electronic Industries Assoc.</td>
</tr>
<tr>
<td>FCC</td>
<td>Federal Communications Commission</td>
</tr>
<tr>
<td>FCI</td>
<td>Fluid Controls Institute</td>
</tr>
</tbody>
</table>
FGMA  Flat Glass Marketing Assoc.
White Lakes Professional Bldg.
3310 S.W. Harrison
Topeka, KS 66611-2279
(913) 266-7013

FM  Factory Mutual Research Organization
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062
(617) 762-4300

FS  Federal Specification (General Services Admin.)
Obtain from your Regional GSA Office, or purchase from GSA Specification Unit (WFSIS); 7th and D Streets, SW, Washington, SC 20406
(202) 472-2205 or 2140

FTI  Facing Tile Institute
P.O. Box 8880
Canton, OH 44711
(216) 488-1211

GA  Gypsum Association
810 First Street, NE, Suite 510
Washington, DC 20002
(202) 289-5440

HPMA  Hardwood Plywood Manufacturers Assoc.
1825 Michael Farraday Drive
P.O. Box 2789
Reston, VA 22090-2789
(703) 435-2900

ICC  International Code Council, Inc.
5203 Leesburg Pike, Suite 708
Falls Church, VA 22041
(703) 931-4533

IEEE  Institute of Electrical and Electronic Engineers
345 E. 47th St.
New York, NY 10017
(212) 705-7900

IESNA  Illuminating Engineering Society of North America
345 E. 47th St.
New York, NY 10017
(212) 705-7926
SECTION 01095 - REFERENCE STANDARDS AND DEFINITIONS

ILI Indiana Limestone Institute of America
Stone City Bank Building, Suite 400
Bedford, IN 47421
(812) 275-4426

IRI Industrial Risk Insurers
85 Woodland St.
Hartford, CT 06102
(203) 520-7300

ISA Instrument Society of America
P.O. Box 12277
67 Alexander Drive
Research Triangle Park, NC 27709
(919) 549-8411

MCAA Mechanical Contractors Association of America
1385 Piccard Dr.
Rockville, MD 20832
(301) 869-5800

MIA Marble Institute of America
33505 State St.
Farmington, MI 48024
(313) 476-5558

MSS Manufacturers Standardization Society of the Valve and Fittings Industry
127 Park St., NE
Vienna, VA 22180
(703) 281-6613

NAAMM National Association of Architectural Metal Manufacturers
200 S. Federal St., Suite 400
Chicago, IL 60605
(312) 922-6222

NAPF National Association of Plastic Fabricators
(Now DLPA)

NBGQA National Building Granite Quarries Assoc.
c/o Rock of Ages Corp.
P.O. Box 482
Barre, VT 05641
(802) 476-3115

NBS National Bureau of Standards (U.S. Dept. of Commerce)
Gaithersburg, MD 20234
(301) 921-1000
<table>
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<tr>
<th>Acronym</th>
<th>Company/Association Name</th>
<th>Address</th>
<th>City, State, Zip Code</th>
<th>Phone</th>
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</thead>
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<tr>
<td>NCMA</td>
<td>National Concrete Masonry Assoc.</td>
<td>2302 Horse Pen Road</td>
<td>Herndon, VA 22071</td>
<td>(703) 713-1900</td>
</tr>
<tr>
<td>NEC</td>
<td>National Electric Code (from NFPA)</td>
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</tr>
<tr>
<td>NECA</td>
<td>National Electrical Contractors Assoc.</td>
<td>7315 Wisconsin Ave., Suite 1300 W</td>
<td>Bethesda, MD 20814</td>
<td>(301) 657-3110</td>
</tr>
<tr>
<td>NEII</td>
<td>National Elevator Industry, Inc.</td>
<td>185 Bridge Plaza, North</td>
<td>Fort Lee, NJ 07024</td>
<td>(201) 944-3211</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Electrical Manufacturers Assoc.</td>
<td>101 L St., NW, Suite 300</td>
<td>Washington, DC 20037</td>
<td>(202) 457-8400</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Assoc.</td>
<td>One Batterymarch Park</td>
<td>P.O. Box 9101</td>
<td>Quincy, MA 02269-9101</td>
</tr>
<tr>
<td>N.F.P.A.</td>
<td>National Forest Products Assoc.</td>
<td>1250 Connecticut Ave., NW, Suite 200</td>
<td>Washington, DC 20036</td>
<td>(202) 463-2700</td>
</tr>
<tr>
<td>NHLA</td>
<td>National Hardwood Lumber Assoc.</td>
<td>P.O. Box 34518</td>
<td>Memphis, TN 38184-1818</td>
<td>(901) 377-1818</td>
</tr>
<tr>
<td>NPA</td>
<td>National Particleboard Assoc.</td>
<td>18928 Premiere Court</td>
<td>Gaithersburg, MD 20879</td>
<td>(301) 670-0604</td>
</tr>
<tr>
<td>NRCA</td>
<td>National Roofing Contractors Assoc.</td>
<td>One O'Hare International Center</td>
<td>10255 W. Higgins Rd., Suite 600</td>
<td>Rosemont, IL 60018-5607</td>
</tr>
</tbody>
</table>
NSF  National Sanitation Foundation  
3475 Plymouth Rd.  
P.O. Box 130140  
Ann Arbor, MI 48105  
(313) 769-8010

NTMA  National Terrazzo and Mosaic Assoc.  
3166 Des Plaines Ave., Suite 132  
Des Plaines, IL 60018  
(708) 635-7744

NWMA  National Woodwork Manufacturers Assoc.  
(Now NWWDA)

NWWDA  National Wood Window and Door Assoc.  
1400 E. Touhy Ave., #G54  
Des Plaines, IL 60018  
(708) 299-5200  
(800) 223-2301

OSHA  Occupational Safety Health Administration (U.S. Dept. of Labor)  
Government Printing Office; Washington, DC 20402

PDI  Plumbing and Drainage Institute  
c/o Sol Baker  
1106 W. 77th St., South Dr.  
Indianapolis, IN 46260-3318  
(317) 251-6970

PS  Product Standard of NBS (U.S. Department of Commerce)  
Government Printing Office; Washington, DC 20402

RFCl  Resilient Floor Covering Institute  
966 Hungerford Drive, Suite 12-B  
Rockville, MD 20805  
(301) 340-8580

SDI  Steel Deck Institute  
P.O. Box 9506  
Canton, OH 44711-9506  
(216) 493-7886

S.D.I.  Steel Door Institute  
c/o A. P. Wherry & Assoc.  
30200 Detroit Road  
Cleveland, OH 44145  
(216) 889-0010
SECTION 01095 - REFERENCE STANDARDS AND DEFINITIONS

SHLMA       Southern Hardwood Lumber Manufacturers Assoc.
            (Now HMA)

SIGMA       Sealed Insulating Glass Manufacturers Assoc.
            401 N. Michigan
            Chicago, IL 60611-4206
            (312) 644-6610

SJI         Steel Joist Institute
            1205 48th Avenue North, Suite A
            Myrtle Beach, SC 29577
            (803) 449-0487

SMACNA      Sheet Metal and Air Conditioning
            Contractors National Association
            P.O. 221230
            Chantilly, VA 22022-1230
            (703) 803-2980

SSPC        Steel Structures Painting Council
            4400 Fifth Ave.
            Pittsburgh, PA 15213-2683
            (412) 268-3327

TCA         Tile Council of America
            P.O. Box 326
            Princeton, NJ 08542
            (609) 921-7050

TIMA        Thermal Insulation Manufacturers Assoc.
            29 Bank Street
            Stamford, CT 06901
            (203) 324-7533
            (Standards now issued by NAIMA)

UL          Underwriters Laboratories, Inc.
            333 Pfingsten Rd.
            Northbrook, IL 60062
            (708) 272-8800

N. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits,
   licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts
   for fee payments, judgments, correspondence, records, and similar documents, established in
   conjunction with compliance with standards and regulations bearing upon performance of the
   Work.

2.1 PRODUCTS (Not Applicable)
3.1 EXECUTION (Not Applicable)
END OF SECTION 01095
SECTION 01200 - PROJECT MEETINGS

1.1 GENERAL

A. It is the responsibility of the Construction Manager (CM) to set up, run and record the minutes for the meetings.

B. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:

1. Preconstruction conferences.
2. Preinstallation conferences.
3. Progress meetings.

C. Preconstruction Conference: A preconstruction conference shall be scheduled before starting any construction to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of the Owner, CM, Architect, and their consultants; the Contractor and his superintendent; major subcontractors; and other concerned parties shall attend.
   a. Participants shall be familiar with the Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items that could affect progress, including the following:
   a. Tentative construction schedule.
   b. Critical work sequencing.
   c. Submittal of Shop Drawings, Product Data, and Samples.
   d. Use of the premises.
   e. Product delivery dates.
   f. Job site safety.

D. Preinstallation Conferences: The CM shall conduct a conference before each activity that requires coordination with other operations.

1. Attendees: The Installer, CM, the Contractor, the Subcontractors related to the work, and representatives of manufacturers and fabricators involved in or affected by the installation shall attend.
   a. Review the progress of other operations and preparations for the activity under consideration at each preinstallation conference, including requirements for the following:
      1) Compatibility problems and acceptability of substrates.
      2) Time schedules and deliveries.
      3) Manufacturer's recommendations.
      4) Warranty requirements.
      5) Inspecting and testing requirements.
   
   b. The CM shall record significant discussions and agreements and disagreements, and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner and the Architect.
SECTION 01200 - PROJECT MEETINGS

c. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate actions necessary to resolve problems and reconvene the conference.

E. Progress Meetings: The CM shall conduct progress meetings at the construction site every two weeks. The Contractor will notify the GC, Owner, the Architect and all subcontractors of scheduled dates. Coordinate meeting dates with preparation of the payment request. It is the Owner/CM/Architect’s option to require weekly job site coordination meetings at each job site in addition to the bi-weekly progress meeting.

1. Attendees: The Owner, CM, Architect, Contractor, and other entities concerned with current progress or involved in planning, coordination, or future activities shall be represented. Participants shall be authorized to conclude matters relating to the Work.

F. Agenda: Review and correct or approve minutes of the previous meeting. Review items of significance that could affect progress. Include topics for discussion appropriate to Project status.

1. Contractor’s Construction Schedule: The Contractor shall review the progress since the last meeting. Determine where each activity is in relation to the Contractor’s Construction Schedule. Determine how to expedite construction behind schedule; secure commitments from parties involved to do so. Discuss revisions required to insure subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of each entity present, including the following:

   a. Time.
   b. Sequences.
   c. Status of submittals.
   d. Deliveries and off-site fabrication problems.
   e. Temporary facilities and services.
   f. Quality and work standards.
   g. Change Orders.
   h. Coordinate with school schedule and programs.

3. Reporting: Distribute meeting minutes to each party present and to parties who should have been present. Include a summary of progress since the previous meeting and report.

4. Schedule Updating: Revise the Contractor’s Construction Schedule after each meeting where revisions have been made. Issue the revised schedule concurrently with the report of each meeting.

1.2 PRODUCTS (Not Applicable)

1.3 EXECUTION (Not Applicable)

END OF SECTION 01200

PROJECT MEETINGS
SECTION 01210 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

1. A Lump Sum Amount is specified in this Section of the Contract Documents. This amount shall be included in the Schedule of Values for the Project.

B. Related Sections:

1. Division 1 Section "Unit Prices" for procedures for using unit prices.
2. A201 General Conditions of the Contract for procedures for submitting and handling Change Orders.
3. Divisions 2 through 16 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

A. At the Architect's request, the contractor shall provide a Change Order Request (COR) for additional work to be deducted from the allowance. Include recommendations that are relevant to performing the Work. The Change Order Request shall include all material and labor with sufficient breakdown for review like any other change to the Contract.

1.4 SUBMITTALS

A. Submit proposals for purchase of products or systems included in the cash allowance, in the form specified for Change Order Requests.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.
SECTION 01210 - ALLOWANCES

1.6 CASH ALLOWANCES (Overhead and profit are permitted totaling a maximum of 15% per the AIA Contract. Supervision, bond and insurance are not permitted)

A. Cash allowance shall be used only as directed and approved by the Architect for the Owner's purposes.

B. The Change Order Request format shall be used to request authorization for use of funds from the cash allowance. The Contractor's overhead and profit margins are fixed to a maximum of 15% per the AIA Contract. The contractor is not permitted to charge for additional supervision, bond and insurance as these costs are included in the Base Contract Sum.

C. At Project closeout, the contractor shall provide a full credit for unused amounts remaining in the cash allowance to the Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

3.3 SCHEDULE OF ALLOWANCES

A. $400,000.00 total cash allowance. Please note that once the project is awarded the Schedule of Values must reflect $100,000.00 cash allowance for the Workforce Development Center and $300,000.00 cash allowance for Rowan Medicine.

END OF SECTION 01210
1.1 GENERAL

A. The Contractor shall use the enclosed Cover Page form for every copy of every shop drawings submitted with the exception of full size drawings that have a title block for custom or project specific materials or systems. The Contractor’s Cover Page form shall be signed by the Project Manager with an original signature indicating that the information has been reviewed and coordinate.

B. Submittal Procedures: Coordinate submittal and preparation with construction, fabrication, other submittals, and activities that require sequential operations with all Sub-Contractors. Transmit in advance of construction operations to avoid delay.

1. Coordinate submittals for related operations to avoid delay because of the need to review submittals concurrently for coordination. The Architect reserves the right to withhold action on a submittal requiring coordination until related submittals are received.

2. Processing: Allow 2 weeks for initial review. Allow more time if the Architect must delay processing to permit coordination with other trades or Owner’s contractors. Allow 2 weeks for reprocessing.

   a. No extension of Contract Time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.

   b. All Shop Drawings, product data and samples shall be submitted within forty-five (45) days of Notice of Award. No Payments will be approved if the Shop Drawings process is not completed within this time schedule.

   c. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products. No Substitutions will be considered after 30 days.

C. Contractor's Construction Schedule: Prepare a horizontal bar-chart-type, contractor's construction schedule. Provide a separate time bar for each activity and a vertical line to identify the first working day of each week. Use the same breakdown of Work indicated in the "Schedule of Values." Indicate estimated completion in 10 percent increments. As Work progresses, mark each bar to indicate actual completion.

1. Submit within 14 days of the date established for "Commencement of the Work."

2. Prepare the schedule on stable transparency, or other reproducible media, of width to show data for the entire construction period.

3. Secure performance commitments from parties involved. Coordinate each element with other activities; include minor elements involved in the Work. Show each activity in proper sequence. Indicate sequences necessary for completion of related Work.

4. Coordinate with the Schedule of Values, list of subcontracts, Submittal Schedule, payment requests, and other schedules.
SECTION 01300 – SUBMITTALS

5. Indicate completion in advance of Substantial Completion. Indicate Substantial Completion to allow time for the Architect's procedures necessary for certification of Substantial Completion.

6. Phasing: Show how phased completion affects the Work.

7. Work Stages: Indicate important stages for each portion of the Work.

8. Area Separations: Provide a separate time bar to identify each construction area for each portion of the Work. Indicate where each element must be sequenced with other activities.

D. The Contractor shall receive the schedule from each Sub-Contractor. The Contractor shall coordinate with all Sub-Contractors and prepare an overall construction schedule in five (5) days to submit to the Owner / Architect for approval.

E. Submittal Schedule: After developing the Contractor's Construction Schedule, prepare a schedule of submittals. Submit the Submittal Schedule to indicate compliance with Item A, Paragraph 2b, on page one of this section.

1. Coordinate with list of subcontracts, Schedule of Values, list of products, and the Contractor's Construction Schedule.

2. Prepare the schedule in chronological order. Provide the following information:

   a. Date for first submittal.
   b. Related details on drawings.
   c. Related Section number in the Specifications.
   d. Submittal category (Shop Drawings, Product Data, or Samples).
   e. Name of the subcontractor.
   f. Description of the Work covered.
   g. Date for the Architect's final approval.

3. Schedule Distribution: Distribute copies of the Contractor's Construction Schedule and the Submittal Schedule to the Architect, Owner, subcontractors, and parties required to comply with submittal dates. Post copies in the field office.

   a. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their Work and are no longer involved in construction activities.

   b. Updating: Revise the schedule after each meeting or activity where revisions have been made. Issue the updated schedule concurrently with the report of each meeting.

F. Daily Construction Reports: The Contractor shall prepare a daily report recording events at the site and submit copies to the Owner, Construction (if applicable) and Architect on a monthly basis or upon request. Include the following information:

1. List of subcontractors at the site.
2. High and low temperatures, general weather conditions.
3. Accidents and unusual events.
4. Stoppages, delays, shortages, and losses.
5. Meter readings and similar recordings.
7. Orders and requests of governing authorities.
8. Services connected, disconnected.
9. Equipment or system tests and startups.
10. Substantial Completions authorized.
11. A list of all visitors indicating the nature of their visit, the company they represent and the person with whom they spoke.

G. Color Selection Schedule: The Contractor shall submit a color selection schedule providing a listing of every product that requires color selections and categorized by exterior colors, interior colors and by room. The Contractor is responsible to coordinate meeting times with the Owner and Construction Manager (if applicable) to select colors so as not to affect the overall construction schedule or material procurement. All color samples shall be delivered to the job site trailer. **Do not submit color samples with shop drawings to the Architect.** Provide actual material color samples. **Reproduced paper or web-based email color charts are not acceptable.**

H. Shop Drawings: The Contractor shall submit newly prepared information drawn to scale. Indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information. The Contractor shall email electronic Shop Drawings to shopdrawings@garrisonarch.com Each separate Shop Drawing shall be submitted in a separate email as one PDF file with the “Shop Drawing Cover Page” completely filled out as the first page. The Shop Drawings shall be numbered sequentially. Include the following information:

1. Dimensions.
2. Identification of products and materials included by sheet and detail number.
3. Compliance with standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.
6. Electronic Sheet Size: At least 8-1/2 by 11 inches **but no larger than 30 by 42 inches.** If required by the Sub-Contractors, the General Contractor shall then **print the entire submittal including review comments** and forward the hardcopies to all of the Sub-Contractors.
   a. Do not use Shop Drawings without an appropriate final stamp indicating action taken.

7. The Contractor shall be responsible to provide the Owner and Construction Manager (if applicable) each with a **paper hardcopy set of all final Shop Drawings including review comments and appropriate final stamp indicating action taken.** Promptly provide each shop drawing paper copy as approved. Do not hold or delay the paper copy from the field.

I. Product Data: Collect Product Data into a single submittal for each element of construction. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, mark copies to indicate applicable information.

1. Include the following information:
SECTION 01300 – SUBMITTALS

a. Manufacturer's printed recommendations.
b. Compliance with trade association standards.
c. Compliance with recognized testing agency standards.
d. Application of testing agency labels and seals.
e. Notation of dimensions verified by field measurement.
f. Notation of coordination requirements.

2. Preliminary Submittal: Submit a preliminary single copy of Product Data where selection of options is required.

3. Submittals: Submit a PDF via email to shopdrawings@garrisonarch.com with the completed “Shop Drawing Cover Page” as the first page of the PDF. The Architect will return the PDF via email marked with action taken. Please note that the Contractor shall be required to submit a paper copy of all finalized Shop Drawings to the Owner and Construction Manager (if applicable).

a. Unless noncompliance with Contract Documents is observed, the submittal serves as the final submittal.

4. Distribution: Furnish copies to installers, subcontractors, suppliers, and others required for performance of construction activities. Show distribution on Cover Page forms. Do not proceed with installation until a copy of Product Data is in the Installer’s possession.

a. Do not use unmarked Product Data for construction.

J. Samples: Submit full-size Samples cured and finished as specified and identical with the material proposed. Mount Samples to facilitate review of qualities. Provide samples to the Owner or Construction Manager’s on-site office. Do not deliver to the Architect.

1. Include the following:

a. Specification Section number and reference.
b. Generic description of the Sample.
c. Sample source.
d. Product name or name of the manufacturer.
e. Compliance with recognized standards.
f. Availability and delivery time.

2. Submit Samples for review of size, kind, color, pattern, and texture, for a check of these characteristics, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed. Where variations are inherent in the material, submit at least 3 units that show limits of the variations.

a. Refer to other Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar characteristics.
b. Refer to other Sections for Samples to be incorporated in the Work. Samples must be undamaged at time of use. On the Cover Page, indicate special requests regarding disposition of Sample submittals.

c. Samples not incorporated into the Work, or designated as the Owner's property, are the Contractor's property and shall be removed from the site.

3. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 3 sets. One set will be returned marked with the action taken. Maintain sets of Samples, at the Project Site, for quality comparison.

a. Unless noncompliance with Contract Documents is observed, the submittal may serve as the final submittal.

b. Sample sets may be used to obtain final acceptance of the construction associated with each set.

4. Distribution of Samples: Distribute additional sets to subcontractors, manufacturers, and others as required for performance of the Work. Show distribution on Cover Page forms.

K. Quality Assurance Submittals: Submit quality-control submittals, including design data, certifications, manufacturer's instructions, and manufacturer's field reports required under other Sections of the Specifications.

1. Certifications: Where certification that a product or installation complies with specified requirements is required, submit a notarized certification from the manufacturer certifying compliance.

a. Signature: Certification shall be signed by an officer authorized to sign documents on behalf of the company.

L. Architect's Action: Except for submittals for the record or information, where action and return are required, the Architect will review each submittal, mark to indicate action taken, and return. Compliance with specified characteristics is the Contractor's responsibility.

1. Action Stamp: The Architect will stamp each submittal with an action stamp. The Architect will mark the stamp appropriately to indicate the action taken.

2. Unless requested and paid by the submission contractor, all submittals will be returned by email. All review times start when the Architect receives the submission in his office.

3. "Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications. This check is only for the review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for verifying quantities, dimensions, field conditions and coordinating all work, information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the work of all trades;
and for performing work in a safe and satisfactory manner. Review does not authorize changes to contracts sum, or project completion date unless stated on separate letter or change order. Refer to the A201 Contract, including but not limited to sections 3.2, 3.3, 3.5, 3.12 and 4.2.7.”

M. The Contractor shall be responsible to note in the Cover Page of the shop drawings any changes or deviations from the contract documents. This is to include but is not limited to manufacturers, electrical, plumbing, mechanical and structural requirements. The Contractor shall be responsible to distribute to all affected contractors and subcontractors all shop drawings which may affect their work.

N. Deviations from the construction documents must be noted by the General Contractor at the time of shop drawing submission. Failure to do so will result in the implication of Section 3.2 of the General Conditions and Paragraphs 3.2.1, 3.2.2 and 3.2.2.1.

O. Approval of shop drawings is conditional upon the contractor fully and completely complying with all review comments by the Owner, Architect, and Engineer. Where the contractor fails to or is unable to fully and completely comply with every review comment, then the shop drawings are disapproved (whether or not they are stamped or noted as "approved" in any manner in any review comment) and must be resubmitted as within seven (7) days. Immediately upon receipt of shop drawing review comments, the contractor is responsible for carefully reviewing all comments in detail and for complying with comments. Where unable to fully satisfy any comment or where the contractor takes exception to any comment, revise and resubmit acceptable shop drawings (or, where taking exception, notify the Architect / Engineer in writing) within seven (7) days. Where the contractor fails to comply with these requirements (including resubmitting/notifying within the seven (7) day period specified), the contractor shall provide acceptable equipment meeting all specified requirements and all review comments (including removing unacceptable equipment [if installed] and replacing with acceptable equipment) at no cost to the Owner.

P. No extra claims, time or compensation shall be granted under any circumstance associated with any party’s failure or delay in properly submitting, transmitting, obtaining, reviewing, and/or coordinating shop drawings.

2.1 SUBSTITUTIONS

A. Substitution submittals shall be made no later than 30 days after Notice to Proceed in order to provide time for comparison review. All submittals after 30 days shall be in strict accordance with the basis of design / specified products. No Substitutions will be considered after 30 days.

B. Materials and equipment manufacturers and catalog numbers specified constitute the type and quality of design, material, workmanship, ruggedness of construction, resistance to vandalism, exact operating and performance characteristics, features, configuration, dimensions, etc. The Architect / Engineer will consider substitutions of similar equipment superior to specified equipment (meeting or exceeding all characteristics of the specified equipment).
SECTION 01300 – SUBMITTALS

C. Submit shop drawings associated with substitutions complete with **comparison documentation** necessary to establish compliance with the basis of design. Submit samples of substitutions where requested. If comparison documentation and/or samples are not submitted when required, the request for substitution will be denied.

D. Determination of compliance with specifications rests with the Architect/Engineer. When a request for substitution is denied, furnish the equipment specified. The Architect’s/Engineer's decisions in cases of substitutions are final and binding upon the contractor, provide equipment accordingly. No claims for time delay, contract extensions or cost will be considered.

E. Pay all costs associated with a substitution where granted. For the provisions of this section, "substitutions" includes equipment where characteristics or operation vary significantly from equipment specified (including equipment of the specified manufacturer). This includes costs incurred by any party (Contractor, Sub-contractors, Owner, Architect, Engineers, etc.), costs resulting from differences of details, configuration, ratings, operation, characteristics, and dimensions between the specified and substituted equipment, costs to provide features of the specified equipment which may be manufacturer's options of the substituted equipment, and costs to remove and replace work already installed and any other remedial work as a result of substitutions. Approval of substitutions is conditional upon there being no cost change to the contract, unless specifically indicated on the shop drawings submittal and corresponding approval. The Contractor is fully responsible for coordinating with the Owner, Architect, and other trades to identify all possible cost impacts associated with any substitution before releasing equipment and before any party proceeds with work effected by the substitution.

F. Submit bid based on the items as specified. Substitutions will be considered only after a contract has been awarded.

G. “Or Equal” substitutions are permitted so long as they are equal to or superior to the basis of design and the Contractor takes full responsibility for all coordination and costs associated with collateral issues related to the substitution. No Substitutions will be reviewed during the bidding process. The Contractor takes full responsibility for all substitutions.

END OF SECTION 01300
Contractor’s Letterhead
Contractor’s Letterhead to Include Name, Physical Address, Telephone Number and Fax Number
SHOP DRAWING COVER PAGE

Project Name
Date

Garrison Architects
Architect’s Name
713 Creek Road
Bellmawr, NJ 08031

Sub Contractor’s Name, Physical Address, Telephone Number and Fax Number
Supplier’s Name, Physical Address, Telephone Number and Fax Number
Manufacturer’s Name, Physical Address, Telephone Number and Fax Number
Specification Number and Specification Title and Section
Construction Document Plan Drawing Number and Detail Reference
Contractor’s Quality Assurance Signature

Check one of the following:

☐ The signature above certifies that the enclosed submittal is in conformance with the construction documents and in fact is the exact product and manufacturer specified. The signature confirms that the Contractor is responsible for dimensions and quantities that have been field verified and that the Shop Drawing will be distributed to all affected Contractors whose work may be affected by the material or equipment enclosed.

☐ The signature above certifies that the enclosed submittal is in conformance with the construction documents and in fact a substitution of the product and manufacturer specified. The Contractor shall provide all Substitutions no later than thirty (30) days from Notice to Proceed and fully comply with page 01300, paragraph 2.1. A complete comparison document must be provided. The signature confirms that the Contractor is responsible for dimensions and quantities that have been field verified and that the Shop Drawing will be distributed to all affected Contractors whose work may be affected by the material or equipment enclosed.

The Contractor assumes responsibility to fully comply with Specification Section 01300, Submittals,” and note below any changes or deviations that have resulted from the proposed product substitution. The Contractor also is solely responsible to communicate these changes to all other Prime Contractor and Sub Contractors following review by the Architect / Engineer.

SHOP DRAWING NO

<table>
<thead>
<tr>
<th>RECEIVED FROM GC</th>
<th>Date</th>
<th>Reviewed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTIN EN ENGINEER</td>
<td></td>
<td>Provide as Corrected</td>
</tr>
<tr>
<td>RETURN FROM ENG</td>
<td></td>
<td>Revise and Resubmit</td>
</tr>
<tr>
<td>RETURN TO GC</td>
<td></td>
<td>Rejected</td>
</tr>
</tbody>
</table>

Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. The contractor is responsible for all corrections indicated. This check is only for the review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for verifying quantities, dimensions, field conditions and coordinating all work; including all electric for all HVAC and all other equipment; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the work of all trades; and for performing work in a safe and satisfactory manner. Review does not authorize changes to contracts sum, or project completion date. Refer to the A201 contract, including but not limited to sections 3.2, 3.3, 3.5, 3.12, and 4.27. The contractor shall provide all portions of the work per the manufacturer’s installation recommendations and instructions.
SECTION 01310 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 00 and 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
4. Daily construction reports.
5. Material location reports.
6. Field condition reports.
7. Special reports.

1.3 SUBMITTALS

A. Submittals Schedule: Submit six copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's and Construction Manager's final release or approval.

B. Contractor's Construction Schedule:

1. The Contractor shall prepare, revise and maintain the construction schedule for all Subcontractors. The Project will be scheduled and monitored using the latest version of Primavera P6, a proprietary computer software program developed by Primavera Systems, Inc., Bala Cynwyd, PA 19004 or approved equal. The Contractor shall develop the schedule (in coordination with Construction Manager and other Prime Subcontractors) in sufficient detail and clarity so that the contractors can plan, schedule and control the work properly and so that Construction Manager can readily monitor and follow the progress for all portions of the work. Construction Manager shall receive electronic copies of all schedules and updates. The Contractor shall complete a detailed schedule for the entire project that must be submitted and accepted prior to release of the second application for payment. The schedule in no way takes the place of Contractor field coordination.
SECTION 01310 - CONSTRUCTION PROGRESS DOCUMENTATION

2. This section describes the Progress Schedule requirements. Each Subcontractor shall provide all necessary information, in connection with their work, in a timely manner, to enable the Contractor to comply with these requirements. The Owner will also have specific needs for phasing of site/construction access and other issues as outlined in the Contract Documents which are to be coordinated within the schedule. No additional costs will be considered to coordinate the phasing needs and reasonable sequencing needs of the Owner. Mandatory scheduling meetings will be held monthly after the Contractor completes the detailed schedule and it is approved by the Construction Manager.

3. The Contractor shall prepare all schedules and all monthly updates based upon information furnished by the Subcontractors and based on Construction Manager’s observations of the work in progress. The schedule shall be based upon each of the Subcontractors working schedule and used to plan, and organize the work (in conjunction with the Contractor’s field coordination efforts), record and report actual performance and progress, and show how the Subcontractor(s) plans to complete all remaining work.

4. The completed detailed schedule shall be distributed to all Subcontractors and to Construction Manager. When the schedule is approved by the Subcontractor(s) and accepted by the Owner, it shall become one of the Contract Documents. The schedule may be revised to show changes in the Contractor’s method or manner of performance; delays, changes, additions or deletions of the work, only after submission to the Construction Manager or Owner and subsequent Construction Manager or Owner’s acceptance.

5. This Contract acknowledges that float belongs to the project and can be shared by the Owner and the Contractor(s).

C. Daily Construction Reports: Submit three copies at weekly intervals.

D. Material Location Reports: Submit three copies at weekly intervals.

E. Field Condition Reports: Submit three copies at time of discovery of differing conditions.

F. Special Reports: Submit three copies at time of unusual event.

1.4 QUALITY ASSURANCE

A. Pre-scheduling Conference: Conduct a conference at the Project site. Review methods and procedures related to the Contractor’s Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review time required for review of submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for completion and startup procedures.
9. Review and finalize list of construction activities to be included in schedule.
10. Review submittal requirements and procedures.
11. Review procedures for updating schedule.
SECTION 01310 - CONSTRUCTION PROGRESS DOCUMENTATION

1.5 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit prior to initial application for payment. Submit concurrently with preliminary bar-chart schedule or network diagram. Include all submittals in the schedule. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.
4. Shop drawing log and schedule is to be updated and submitted at each job meeting along with job meeting report form.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
SECTION 01310 - CONSTRUCTION PROGRESS DOCUMENTATION

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
4. Startup and Testing Time: Include not less than 30 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and Construction Manager's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
6. Work Restrictions: Show the effect of the following items on the schedule:
   a. Coordination with existing construction.
   b. Limitations of continued occupancies.
   c. Uninterruptible services.
   d. Partial occupancy before Substantial Completion.
   e. Use of premises restrictions.
   g. Seasonal variations.
   h. Environmental control.

7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
   a. Subcontract awards.
   b. Submittals.
   c. Purchases.
   d. Mockups.
   e. Fabrication.
   f. Sample testing.
   g. Deliveries.
   h. Installation.
   i. Tests and inspections.
   j. Adjusting.
8. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

a. Structural completion.
b. Permanent space enclosure.
c. Completion of mechanical installation.
d. Completion of electrical installation.
e. Substantial Completion.

9. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

E. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

1. Refer to the A201 – General Conditions of the Contract for Construction for cost reporting and payment procedures.

2. Contractor shall assign cost to construction activities on the CPM schedule. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be under required principal subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.

3. Each activity cost shall reflect an accurate value subject to approval by Architect.

4. Total cost assigned to activities shall equal the total Contract Sum.

F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S DETAILED CONSTRUCTION SCHEDULE

A. 1. The Contractor with their scheduling consultant will meet with all Subcontractors and the Construction Manager within 7 days after the pre-construction meeting for the purpose of identifying all the scheduling input required for the Contractor to produce the Detailed Schedule. The Detailed Schedule will then be prepared for review within seven (7) calendar days of the meeting. All Subcontractors and Construction Manager shall review the schedule and note any corrections required as a condition of approval within seven (7) calendar days of receipt. The Contractor will prepare a finalized copy of the Detailed Schedule acknowledging their acceptance of the Schedule as their plan to construct the project. The approved, accepted Detailed Schedule will be the Contract Document used by Construction Manager to monitor the progress of the Subcontractor(s). Subsequent meetings may be required with Construction Manager and all Subcontractors. All comments on the schedule will be sent to the Contractor and Construction Manager simultaneously.
The Detailed Schedule shall comply with the various limits imposed by the scope of work and by any contractually specified intermediate milestone dates and completion dates included in the contract. The degree of detail shall be to the satisfaction of Construction Manager.

2. Activity durations will be in work days and will have a maximum duration of twenty (20) WORKING DAYS, except in the case of non-construction activities such as procurement of materials and delivery of equipment. The project calendar shall consider and reflect planned non-work days for weekends, holidays, weather days, and planned premium work such as shift work and extended work days. Milestones will be clearly identified. Intermediate milestones will be required including but not limited to anchor bolt setting, structural steel delivery/erection, sequencing of building areas, building enclosure, overhead rough-in, phased completion of various areas, etc. The Contract Completion date shall be fixed using a constraint.

3. The Contractor will furnish Construction Manager and each Subcontractor with a copy of the initial Detailed logic diagram, computer printouts, detailed bar chart and summary bar chart. Construction Manager will also receive electronic versions of the entire schedule and any updates via email.

4. If the Contractor fails to produce an acceptable Schedule as determined by Construction Manager, Construction Manager may takeover the scheduling requirements and deduct the cost of same from the Contractor’s contract sum.

5. In the event a dispute arises regarding the interpretation of the Contract CPM Scheduling requirements; Construction Manager will make the final decision as to interpretation.

6. The activities will be coded to facilitate selection, sorting and preparation of reports. Each activity will have a unique number and description. All construction activities shall be manpower, man-hour and resource loaded. The following activity coding scheme should be used:
   - Responsibility – Identify Contractor, Sub-contractor, Owner, etc.
   - Phase – Phase identification from the phasing plan
   - Area – Subdivide schedule activities into logical sections including site, building areas, wings, floors, etc.
   - Masterspec, 16 division format to be assigned.
   - Procurement activities to be separate and include all major submittals, approvals and fab/del times and shall be logically tied to the appropriate installation activity.
   - Coordination and shop drawing logic shall be tied to the submittals.

7. The following computer outputs may be required by Construction Manager as part of the initial schedule submission, and each MONTHLY update thereafter: The Contractor shall provide Construction Manager with a computer disk of the schedule with each submission. All logic changes shall be noted by the consultant in a narrative report that shall also provide an executive summary of the project status.
   - Critical Activity Sort (float equals 10 day or less)
   - Early start sort
SECTION 01310 - CONSTRUCTION PROGRESS DOCUMENTATION

- Eight (8) week “Look Ahead” detailed bar chart with narrative on critical path & milestones.
- Summary bar chart
- COM logic diagram (for baseline purposes) and a new logic diagram if logic is revised after baseline is approved.
- Additional computer sorts as required by Construction Manager
- Copies shall be provided for each subcontractor
- One week filter to be used at weekly Foreman's Meeting.

8. The schedule shall show: Activity ID, Activity Description, Original Duration, Remaining Duration, Percent Complete, Early Start, Early Finish, Late Start, Late Finish and Total Float.

B. SCHEDULE UPDATE

1. Each Subcontractor is required to attend and participate in a CPM update review meeting with the Contractor and Construction Manager on a monthly basis. Attendance is mandatory and every effort will be made to have the scheduling meetings immediately following a job meeting. Each Subcontractor will supply update information including a complete and accurate report of procurement items, and work activities. If the information is not submitted, Construction Manager will provide information available at the time of the meeting. The schedule update information will include, but not be limited to:
   
   a. Actual start dates
   b. Actual completion dates
   c. Activity percent completion with actual start date
   d. Remaining duration of activities in progress

2. All schedule update information outlined above will be reviewed by Construction Manager at the update meeting. The Contractor shall provide Construction Manager with all reports as specified in previous paragraphs within 5 calendar days of the meeting. No logic, original duration, or other changes shall be made to the initial schedule without approval from Construction Manager.

3. The Contractor shall then prepare an eight (8) week look-ahead bar chart that will be issued to all at the next job meeting. A copy of the other scheduling documents will be available to each Subcontractor for review at the jobsite trailer.

4. Issue the draft update by the 25th of the month, final versions to be developed, reviewed and accepted by the contractors by the 5th of the next month.

C. RECOVERY SCHEDULE

1. If the Contractor fails to achieve the planned progress, as indicated in the approved/updated Detailed Schedule and/or the Contractor’s lack of progress delays attaining intermediate milestone by more than ten (10) calendar days (monthly or cumulatively); the Contractor will submit to Construction Manager for approval a proposed Recovery Schedule indicating how the Contractor will recover the time lost.
SECTION 01310 - CONSTRUCTION PROGRESS DOCUMENTATION

If the Contractor fails to submit a Recovery Schedule and/or fails to cooperate with the Recovery Schedule process, the Construction Manager can immediately order the Contractor to accelerate completion of the late activities by whatever means necessary, including additional personnel, equipment, overtime, double shifts, etc., without any additional costs to the Owner. The Owner/Construction Manager can withhold future progress payments until the Contractor's progress is in compliance with the contract schedule or has approved proposed adjustments to the contract milestones, extension of contract time or modification of the contract schedule.

1. Near the end of the job, Construction Manager may direct the Contractor to establish a detailed work to complete schedule that is updated on a weekly basis.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial Completions and occupancies.
19. Substantial Completions authorized.

B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
SECTION 01310 - CONSTRUCTION PROGRESS DOCUMENTATION

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

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Retain Scheduling Consultant: The contractor may engage, at his option, a consultant to provide planning, evaluation, and reporting of the construction schedule if Contractor does not employ skilled personnel with experience in CPM scheduling and reporting techniques. Qualifications of in-house or scheduling consultant must be submitted for approval.

B. Meetings: Scheduler shall attend all meetings related to Project progress, alleged delays, and time impact.

C. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

D. Distribution: Distribute copies of approved schedule to Architect, Construction Manager, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01310
SECTION 01315 - CPM SCHEDULE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for the critical path method (CPM) of scheduling and reporting progress of the Work.

B. The Contractor shall have the primary responsibility for the preparation and maintenance of the CPM schedule and the reporting progress of the overall Work.

1.2 RELATED SECTIONS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.3 SUBMITTALS

A. Submittal and Distribution: Within 15 calendar days of the issuance of the Notice to Proceed, the Contractor shall submit 8 copies of the Preliminary Network Diagram, Preliminary Network Diagram reflecting first 60 days of work, and additional items identified in Paragraph 3.1 herein for review and acceptance by the Construction Manager and Architect.

B. Submittal and Distribution: Within 30 calendar days of the issuance of the Notice to Proceed, the Contractor shall submit 3 copies of the initial CPM Schedule for review and acceptance by the Construction Manager and Architect.

C. Schedule Updating: Revise the schedule within 7 calendar days after each meeting, or other activity, where revisions have been recognized or made.

1. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

D. Distribution: As determined during the Pre-Construction Meeting and as updated during the course of the Work.

1. Distribute printed copies of the Baseline Schedule and updates to the Construction Manager and Architect.

2. Distribute the Baseline Schedule and updates in electronic PRX and PDF formats, by email, to the Construction Manager and Architect. Utilize a unique identifier for each successive update.

3. Post copies of the CPM Schedule in the Project meeting rooms and temporary field offices of each Subcontractor.

E. Regular Project Meetings: At each regular project meeting the Contractor shall issue the latest updated schedule and a two-week look ahead schedule to each of the participants.

F. Application for Payments: The Contractor shall issue the latest updated schedule and reports concurrently with each monthly Application for Payment.
SECTION 01315 - CPM SCHEDULE

G. Suspension of Payments: The submission and update of the CPM scheduling information is critical to the success of the project and the ability of all parties to manage the work.

1. Initial Submittal: The Owner shall have the right to withhold progress payments from the Contractor until the Baseline Schedule is accepted.
2. Monthly Submittals: The Owner shall have the right to withhold progress payments from the Contractor if s/he fails to update and submit monthly progress schedules and reports as specified.

1.4 DEFINITIONS

A. Critical Path Method (CPM): A method of planning and scheduling a construction project where activities are arranged based on activity relationships and network calculations determine when activities can be performed and the critical path of the Project.

B. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall project duration.

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

D. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path.
2. Predecessor activity is an activity that must occur before a given activity and controls the start or finish date of its successor(s).
3. Successor activity is an activity that cannot occur until after the start of a predecessor activity.

E. Event: An event is the starting or ending point of an activity.

F. Float: The measure of leeway in activity performance. Accumulative float time belongs to the Owner.

1. Free float: The amount of time an activity can be delayed without adversely affecting the early start of the following activity.
2. Total float: The measure of leeway in starting or completing an activity without adversely affecting the planned project completion date.

G. Milestone: A key or critical point in time for reference or measurement.

1.5 QUALITY ASSURANCE

A. The Contractor's Scheduling Professional: The Contractor shall retain a scheduling consultant to provide planning, evaluating, and reporting by CPM scheduling.

1. The consultant shall be a recognized specialist, acceptable to the Owner, Construction Manager, and Architect, who is an expert in CPM scheduling and reporting.
SECTION 01315 - CPM SCHEDULE

2. The consultant shall have computer facilities that are capable of delivering detailed network diagrams within 48 hours of request.


PART 2 - PRODUCTS

2.1 SCHEDULING PROGRAM

A. Scheduling Program: The Contractor shall use P6 Primavera Project Planner (latest version available) or approved equal for network analysis that has been developed specifically to manage CPM construction schedules.

PART 3 - EXECUTION

3.1 PRELIMINARY NETWORK DIAGRAM

A. Scheduling Work Session: Within 7 calendar days of the issuing of the Notice to Proceed the Construction Manager shall facilitate with the Contractor a Scheduling Work Session. The contractor shall provide input to arrive at an integrated CPM Schedule, which integrates construction activities, durations and sequences to facilitate completion in an orderly manner within the time frames indicated for completion, to coordinate the preparation of the Preliminary Network Diagram and the other requirements of this Section.

B. Preliminary Network Diagram: Within 14 calendar days of the issuing of the Notice to Proceed, the Contractor shall submit a preliminary network diagram. The preliminary network diagram shall outline activities for the first sixty (60) days of construction. Include a summary listing for the remainder of the Work as part of the preliminary diagram.

1. Include each significant construction activity. Coordinate each activity in the network with other activities. Schedule each construction activity in proper sequence.
2. Indicate completion of the Work on the date established for Substantial Completion, unless the Owner agrees otherwise.

C. Cash Requirement Prediction: With submittal of the preliminary work diagram, include a preliminary cash requirement prediction based on indicated activities.

D. Tabulation of Submittals: With submittal of the preliminary network diagrams, include tabulation by date of all project submittals.

E. Distribution: Distribute the preliminary network diagram for review and approval as described in Section 01310. Distribute the preliminary network diagram to parties involved early in construction activities, including the Owner, Construction Manager, and Architect.

3.2 BASELINE CPM SCHEDULE
SECTION 01315 - CPM SCHEDULE

A. Prepare the Baseline Construction Schedule using the network analysis diagram system known as the critical path method (CPM). Follow procedures outlined in AGC's "Construction Planning & Scheduling."

1. Proceed with preparation of the network diagram immediately following receiving the Notice to Proceed.
2. Follow the steps necessary to complete development of the network diagram in sufficient time to submit the CPM Schedule so it can be accepted for use no later than 30 calendar days after the issuance of the Notice to Proceed.
3. Conduct educational workshops to train and inform key project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
4. Establish procedures for monitoring and updating the CPM Schedule and for reporting progress. Coordinate procedures with foreman's meetings, progress meeting and payment request dates.

B. CPM Schedule Preparation: Prepare a list of all activities involved in the Project. Include a list of activities required to complete the Work. Provide the best data available for generation of the network diagram and the CPM schedule.

1. Indicate the estimated time duration, sequence requirements, relationship of each activity in relation to other activities. Use "one working day" as the unit of time. Except for fabrication of materials, no single activity shall exceed 15 working days in duration.
2. Indicate estimated times for the following activities to be performed:
   a. Preparation and processing of submittals.
   b. Purchase of materials.
   c. Delivery.
   d. Fabrication.
   e. Installation.
   f. MEP/FP above ceiling coordination drawing.
3. Treat each story or separate area as a separate numbered activity for principal elements of the Work.
4. Provide detailed sub-schedules to define critical portions of the schedule.
5. Indicate milestone dates of key portions of the work as required by the milestones in Section 01010 and the phasing schedule.

C. Processing: Enter prepared data to produce a time-scaled logical network. Revise data, reorganize activity sequences, and reproduce as necessary to produce the CPM Schedule within the limitations of Section 01010 and the phasing schedule.

D. Format: Display the full network on a minimum number of sheets, of sufficient width to show data clearly for the entire construction period. The critical path should be clearly marked and determinable on the diagram.

E. Initial Issue: Prepare the initial issue of the CPM Schedule network diagram using "Early Start-Total Float" as the sorting criteria. Prepare tabulated reports to show the following:

1. The Contractor or subcontractor and work or activity.
2. Description of the activity.
3. Principal events of that activity.
SECTION 01315 - CPM SCHEDULE

4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in working days.
8. Total float.
9. Average size of workforce per activity.

F. Tabular Report: Prepare and issue 3 tabular reports, sorted as noted.
1. In first report, tabulate and sort by activity number, then by early finish date.
2. In second listing, tabulate and sort by activity number, then by late finish date.
3. In the third report, tabulate and sort by total float, then by early start date.
4. In subsequent issues of these reports, substitute actual start and finish dates for activities completed as of the data date.

G. Prepare listing for ease of comparison with payment requests; coordinate timing with progress meetings.

3.3 REVIEW AND EVALUATION OF SCHEDULE

A. Progress Meetings: The progress of the project in conjunction with the CPM Schedule will be discussed at progress meetings. Participate in joint review and evaluation of schedule with Construction Manager and Architect at each meeting.

B. Evaluate project status to determine work behind schedule and work ahead of schedule. Include:

1. Actual completion dates for work items completed during report period.
2. Actual start dates for work items started during report period.
4. Estimated start dates for work items scheduled to start during month following report period.
5. Changes in duration of work items and minor logic changes.
6. Identification of current and most critical paths to required completion dates.

C. After review, revise as necessary as result of review, and resubmit within 7 calendar days.

3.4 UPDATING SCHEDULE

A. Maintain CPM Schedule to record actual start and finish dates of completed activities. The scheduling consultant will provide an update template projecting the next 2 months of work sorted by contractor on the 20th day of each month. / 2. Update activities by : a. Actual Start date / b. Actual completion date / c. Actual start w/ % complete. / d. Do not predict the remaining duration, let the program calculate.

1. Indicate progress of each activity to date of revision, with projected completion date of each activity.
2. Annotate diagrams to graphically depict current status of Work.
3. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
SECTION 01315 - CPM SCHEDULE

4. Indicate changes required to maintain Date of Substantial Completion.
5. Submit reports required to support recommended changes.

B. Submit updated schedule with each Application for Payment.

1. Work Item Report: Contain work items and dependencies as indicated on network
diagram listed in order or ascending work item number.
2. Separate listing of activities completed during reporting period.
3. Separate listing of activities which are currently in progress indicating their
remaining duration and percent complete.
4. Separate listing of activities which are causing delay to work progress.

C. Provide narrative report to define problem areas, anticipated delays, and impact on the
schedule. Narrative to include impact to the critical path and milestones (i.e. the project is
x days behind/ ahead or schedule & why / the contract milestone for phase 1a is xx/xx/xx;
the actual milestone date for phase 1a is xx/xx/xx and why) Report corrective action taken
or proposed and its effect including the effects of changes on schedules of separate
contractors.

3.5 RELIANCE ON SCHEDULE

A. Expediting Activities:

1. Should any critical path activity fail to be completed within 10 calendar days after
the indicated schedule date, the Contractor shall expedite completion of activity by
whatever means Owner deems appropriate and necessary without additional
compensation to the Contractor.
2. Should any critical path activity performed be 28 or more calendar days behind
schedule, the Owner shall have the right to perform activity or have activity
performed by whatever method Owner may deem appropriate. Costs incurred by
Owner in this activity shall be deducted from the Contract Price.
3. It is expressly understood and agreed that failure by the Owner to exercise the
option to expedite an activity shall not be construed as precedent for any other
activities or as waiver of the Owner's rights to exercise his rights on subsequent
occasions.

B. Contract Extensions: Float time is not for exclusive benefit of either Owner or Contractor.

1. Extensions of time for Contract performance as specified in Contract shall be
granted only to the extent that equitable time adjustments to affected work items
exceed total float time along affected paths of accepted computer printout report in
effect at that time.
2. Slippage of work items will not be the basis for time extensions to the Contract
unless, and until, such slipped work items are resolved in accordance with General
and Supplementary Conditions.

END OF SECTION 01315
SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control. (To be paid and hired by the Owner and coordinated by the Contractor.)

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. See all Contract Documents for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
SECTION 01400 - QUALITY REQUIREMENTS

G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five (5) previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
SECTION 01400 - QUALITY REQUIREMENTS

5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
SECTION 01400 - QUALITY REQUIREMENTS

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven (7) days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

J. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in the Contract Documents.

1.6 QUALITY CONTROL

A. Contractor Responsibilities: Quality-control services are the Contractor's responsibility. The Owner will hire and pay for a qualified testing agency to perform these services but it is the Contractor's responsibility to coordinate and remedy any non-conforming work. Additional tests that are required resulting from any non-conforming work shall be paid for by the Contractor.

1. Contractor will furnish the Architect and Owner with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
3. The Owner will engage a qualified Special Inspector to conduct special tests and inspections oversight in accordance with DCA Bulletin 03-5. The Owner's special inspection services will not relieve the Contractor of responsibility for certifying the work and completing the contract work in accordance with the Contract Documents.
SECTION 01400 - QUALITY REQUIREMENTS

B. The Contractor shall provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required by authorities having jurisdiction, whether specified or not.

1. The Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Submit a certified written report, of each quality-control service to the Construction Manager, Architect, Owner, Special Inspector and authorities having jurisdiction.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

D. Retesting/Reinspecting: The Contractor shall provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, Owner's Special Inspector and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
SECTION 01400 - QUALITY REQUIREMENTS

7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.7 SPECIAL TESTS AND INSPECTIONS (BY OWNER)

A. Special Tests and Inspections: Owner will engage a qualified Testing Agency/Special Inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner in accordance with DCA Bulletin 03-5, and as follows:

B. Special Tests and Inspections: Conducted by a qualified Testing Agency/Special Inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Review test and inspection reports completed by the Contractor's Quality Assurance and Quality Control qualified testing agency. Any irregularities or deficiencies shall be brought to the attention of the Contractor and Architect immediately.
5. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
6. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
7. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
SECTION 01400 - QUALITY REQUIREMENTS

2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

D. The following items shall be tested in accordance with this section if not specifically listed in the Contract Documents as applicable to the Work:

1. Soils and Geotechnical Engineering
2. Foundations
3. Concrete
4. Masonry Reinforcing
5. Structural Steel
6. Cold Formed Steel Framing
7. Roof Trusses (Wood or Steel)
8. Sprayed-on Fire Resistant Materials

END OF SECTION 01400
1.1 GENERAL

A. Summary: This Section specifies construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection facilities.

B. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Building code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, fire department and rescue squad rules. Local traffic requirement.
5. Environmental protection regulations.
6. New Jersey Department of Education.
7. ADA requirements.
8. OSHA.

The Contractor may be required to pay for and obtain building permits, temporary construction trailer permits, etc. as required by the local construction code office.


1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."

D. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

E. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. Submit reports and tests, inspections, meter readings, and procedures performed on temporary utilities. At the earliest time, change over from use of temporary service to use of permanent service.

1.2 PRODUCTS

A. Materials: Provide new materials. If acceptable to the Architect, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.

1. Lumber and Plywood: Comply with Division 6 Section "Rough Carpentry." Provide UL-labeled, fire-treated lumber and plywood for temporary offices and sheds. Provide exterior, Grade B-B high density concrete form overlay plywood for signs. Provide 5/8" (16 mm) thick exterior plywood for other uses.

2. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary offices, shops, and sheds.
3. Paint: Comply with requirements of Division 9 Section "Painting."
   a. For exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
   b. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
   c. For interior walls of temporary offices, provide 2 coats interior latex-flat wall paint.

4. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

5. Water: Provide potable water approved by local health authorities.

6. Open-Mesh Fencing: Provide 0.120-inch- (3-mm-) thick, galvanized 2-inch (50-mm) chain-link fabric fencing 6 feet (2 m) high with galvanized steel pipe posts, 1-1/2 inches (38 mm) I.D. for line posts and 2-1/2 inches (64 mm) I.D. for corner posts.

B. Equipment: Provide new equipment.

1. Water Hoses: Provide 3/4-inch (19-mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet (30 m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

2. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

3. Electrical Power Cords: Grounded extension cords. Use hard-service cords where exposed to abrasion and traffic.

4. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

5. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

6. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
a. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

1.3 EXECUTION

A. Installation, General: Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

1. **Provide each facility ready for use when needed to avoid delay.** Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

2. Conditions of Use: Keep temporary facilities clean and neat in appearance. Operate safely and efficiently. Relocate as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

B. Temporary Utility Installation: The Contractor shall engage the local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.

1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.

2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.

4. Use Charges: **Cost or use charges for temporary facilities are not chargeable to the Owner or Architect.** The Contractor shall pay for all temporary or permanent utilities until Substantial Completion. If the Owner’s utilities are used, the Contractor shall be responsible for metering and reimbursing the Owner for usage. Neither the Owner nor Architect will accept cost or use charges as a basis of claims for Change Orders.

5. Temporary Water Service: (Installed and paid of usage by Contractor). Install temporary water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use. If temporary water is connected to the Owner’s line, the Contractor shall compensate to the Owner for water usage.

6. Temporary Electric Power Service: (installed and paid of usage by Contractor). Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters, and main distribution switch gear.
a. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage.

b. Temporary Lighting: Provide temporary lighting with local switching to fulfill security requirements and illumination for construction operations and traffic conditions.

c. If temporary power/lighting connect to the Owner’s panel, the Contractor shall compensate the Owner for the electrical usage.

d. Under no circumstances will the temporary electric be turned off due to labor disputes, work hours, etc. If any Prime Subcontractor wants to or is working second shift, Saturdays, Holidays, or any other time, temporary electric shall be provided by the Contractor and usage paid for by the Contractor at no additional cost.

C. Temporary Heat: (installed and paid of usage by Contractor). Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Temporary heat must be on to dry out masonry walls at least two weeks prior to painting. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy. All temporary heat must be on by November 11th. Anywhere in the building, the minimum temperature is to be 60 degrees Fahrenheit.

1. Heating Facilities: The use of the building’s permanent HVAC systems is prohibited and shall not be used. The building must be 100% white glove clean and dust free prior to starting the HVAC system. Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP-gas or fuel-oil heaters with individual space thermostatic control. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.

2. Safety Requirements: provide a fire extinguisher for each heating unit. Comply with all local, governmental and manufacturer’s requirements for safe operation.

D. Temporary Telephones: The Contractor shall be responsible for their own telephone service.

E. Sanitary Facilities: (installed and paid for maintenance by Contractor). Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project’s needs. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.
SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1. Toilets: Install self-contained, single occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass fiber reinforced polyester steel or similar nonabsorbent material. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted. The construction team is not permitted to use the school facilities at any time. Provide separate facilities for male and female personnel.

F. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.

1. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.

G. Support Facilities Installation: Locate field offices, storage sheds, and other temporary construction and support facilities for easy access. Maintain facilities until near Substantial Completion. Remove prior to Substantial Completion. If the Contractor wants their own offices, they may provide them. The location will be determined by the Owner.

1. Construction Manager’s, Architect’s/Engineer’s Field Office: The Contractor shall provide NEW furnishings and NEW equipment for a separate temporary job site office. The equipment and furnishings will be turned over to the Owner at completion of the project. The office shall be for the use of the Construction Manager, Architect and Engineers only. The Contractor shall pay all costs for procurement and all costs of the operations and maintenance of this office facility. No workmen are allowed to use this office. The trailer rental and services must be maintained until 30 days after Substantial Completion of the project.

2. Provide a William Scotsman Trailer Model MO-6012 (REF) approved by the construction manager with OSHA approved aluminum steps at each entrance. Contact William Scotsman 856-470-1230 EXT 74232 ATTN Kim Bessey. Kim.bessey@as.willscot.com Secure permit. Pay all costs of permits and electric. Electric meter installation and connection by this contractor. The Contractor shall have this Field Office completely operational within 30 working days after receipt of NOTICE TO PROCEED. Payment will be withheld until these conditions are completed. The contractor is responsible for electrical disconnect and the restoration of the grounds when the trailer is removed from this project. Contact Jim Lauria 609-273-4579 jlauria@greyhawk.com.

3. Provide the following NEW equipment and furnishings:
   (1) Two Metal Desks 38” x 72” minimum
   (2) Two Swivel Chairs for the desks
   (3) Two (2) Tables (folding legs) 30” x 72” for job meetings
   (4) Sixteen (20) folding chairs for job meetings
   (5) Plan Rack (Plan Hold stick set) free standing (5 plan minimum)
   (6) One Plan Table 36” x 96” with stool (Delete plan table if built into trailer)
SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

(7) Two (2) Metal Filing Cabinets, legal size with 4 lockable drawers each.
(8) One Construction First Aid Kit for 20 – 50 people rating
(9) Pre-packaged bottled spring drinking water regular delivery.
(10) One (1) Wall-mounted cork faced tack board 36” x 48”
(11) Latest model HP inkjet printer, as approved by the Construction Manager. Paper and ink cartridges to be supplied for the duration of the project.
(13) One “VIP” Deluxe” portable toilet at trailer location.
(14) High-Speed Internet connection (DSL minimum)

4. Trailer shall have heat and air conditioning to maintain temperature in the range of 68 – 78 degrees F. Provide 100-Amp Three Phase electric service with not less than eight (8) duplex convenience outlets. Provide “VIP Deluxe” portable toilet at the trailer location.

5. **Trailer Internet service:** Assume the account or reimburse monthly $90(approx.) for 12GB data Verizon Jetpack 4G AC7911,4G LTE Mobile Hotspot account #0925179006-001. This service is to begin on 5/1/2019 and terminate 30 days from the Med School date of Substantial Completion.

6. **Trailer:** Arrange for professional cleaning services not less than two times per month by a professional cleaning company approved by the Construction manager.

7. Provide incombustible construction for offices, shops, and sheds located within the construction area or within 30 feet (9 m) of building lines. Comply with requirements of NFPA 241.

8. Storage and Fabrication Sheds: (Contractors): Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on-site.

9. Dewatering Facilities and Drains: (by Contractor). For temporary drainage and dewatering facilities and operations, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations, and construction free of water.

10. Temporary Enclosures: (by Contractor). Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

   a. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. (2.3 sq. m) or less with plywood or similar materials.
b. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.

11. Temporary Lifts and Hoists: The Contractor shall provide facilities for hoisting their own materials.

12. Project Signs: The Contractor shall furnish and install 4' x 8' project identification and other signs where indicated to inform the public and persons seeking entrance to the Project. Support on framing of preservative treated wood or steel. Do not permit installation of unauthorized signs. Engage an experienced sign painter to apply graphics. Comply with details indicated. The content of sign shall be similar to the cover sheet of the drawings plus all prime contractors' names. The content of the sign must also state that this Project has been funded by the New Jersey Economic Development Authority with their logo included.

13. Temporary Exterior Lighting: (Contractor) Install exterior yard and sign lights so signs are visible when Work is being performed.


   a. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C).

15. Pest Control: (by Contractor). Retain an exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Employ this service to perform extermination and control procedures at regular intervals so the Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

H. Access to the building pad (by the Contractor): The Contractor shall provide and maintain through the construction project a stoned access roadway for vehicles and deliveries to the building pad and as required around the building pad. This temporary access roadway shall be installed at the beginning of the project and be removed at the end of the project with the area affected fully restored.

I. Security and protection facilities installation: (by Contractor). Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Architect.

a. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

b. Store combustible materials in containers in fire-safe locations.

c. Prohibit smoking in hazardous fire-exposure areas.

d. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

2. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

3. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

4. Enclosure Fence: Before excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.

   a. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.

   b. Provide plywood fence, 8 feet (2.5 m) high, framed with four 2-by-4-inch (50-by-100-mm) rails, and preservative-treated wood posts spaced not more than 8 feet (2.5 m) apart.

   c. The Contractor shall provide a temporary construction fence whether shown on the contract documents or not as required to separate the area or areas under construction from the Owner’s area or areas used by the public. The temporary fencing shall be approved by the Owner prior to installation.

5. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

6. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.
J. Operation: The Contractor shall be responsible to enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

K. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements. Maintain temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

L. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

M. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor’s property. The Owner reserves the right to take possession of project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:
   a. Replace air filters and clean inside of ductwork and housings.
   b. Replace significantly worn parts and parts subject to unusual operating conditions.
   c. Replace lamps burned out or noticeably dimmed by hours of use.

3. Prior to Final Completion, restore site damages resulting from construction activities. This includes, but is not limited to: removal of temporary fencing; restoring site disturbance resulting from contractor parking, trailers, sanitary facilities, dumpsters, construction equipment, etc. Site restoration to include fine grading with approved topsoil and reseeding with approved seed.

END OF SECTION 01500
SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous construction waste.
2. Recycling nonhazardous construction waste.
3. Disposing of nonhazardous construction waste.

B. Related Sections include the following:

1. Division 1 Section "Temporary Facilities and Controls" for environmental-protection measures during construction.
2. Division 2 for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.
3. Division 4 Section "Unit Masonry Assemblies" for disposal requirements for masonry waste.

1.3 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

C. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

D. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

E. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE GOALS

A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 50 percent by weight of total waste generated by the Work.
SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

B. Salvage/Recycle Goals: Owner's goal is to salvage and recycle as much nonhazardous construction waste as possible including the following materials:

1. Construction Waste:
   a. Site-clearing waste.
   b. Masonry and CMU.
   c. Lumber.
   d. Wood sheet materials.
   e. Wood trim.
   f. Metals.
   g. Roofing.
   h. Insulation.
   i. Carpet.
   j. Gypsum board.
   k. Piping.
   l. Electrical conduit.
   m. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

   1) Paper.
   2) Cardboard.
   3) Boxes.
   4) Plastic sheet and film.
   5) Polystyrene packaging.
   7) Plastic pails.

1.5 SUBMITTALS

A. Waste Management Plan: Submit 3 copies of plan within 30 days of date established for the Notice to Proceed.

B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit three copies of report. Include the following information:

   1. Material category.
   2. Generation point of waste.
   3. Total quantity of waste in tons (tonnes).
   4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).
   5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
   6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
   7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

C. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division I Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.7 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

D. Forms: Prepare waste management plan on forms included at end of Part 3.
SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Architect. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with Division 1 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 1 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.
SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

C. Salvaged Items for Owner's Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site.
5. Protect items from damage during transport and storage.

D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

3.3 RECYCLING CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

A. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

1. Pulverize concrete to maximum 4-inch (100-mm) size.

B. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.

1. Pulverize masonry to maximum 4-inch (100-mm) size.

   a. Crush masonry and screen to comply with requirements in Division 2 Section "Earthwork" for use as general fill.
2. Clean and stack undamaged, whole masonry units on wood pallets.

C. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

D. Metals: Separate metals by type.
   1. Structural Steel: Stack members according to size, type of member, and length.
   2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

E. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

F. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
   1. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.

G. Carpet: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
   1. Store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

H. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

I. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:
   1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
   3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
   4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees on-site.

C. Wood Materials:
   1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
   2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.
SECTION 01524 - CONSTRUCTION WASTE MANAGEMENT

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01524
1.1 GENERAL

A. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock.

   1. "Named Products" are items identified by the manufacturer's product name, including make or model number or designation, shown or listed in the manufacturer's published product literature.

B. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

C. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

D. Product List: Products required are included in all sections of these specifications. Provide the manufacturer's name and proprietary product names for each item. Coordinate product list with the Contractor's Construction Schedule and Submittal Schedule.

   1. Form: Prepare product list with information on each item tabulated under the following column headings:

   a. Related Specification Section number.
   b. Generic name used in Contract Documents.
   c. Proprietary name, model number, and similar designations.
   d. Manufacturer's name and address.
   e. Supplier's name and address.
   f. Installer's name and address.
   g. Projected delivery date or time span of delivery period.

   2. Within 30 days after date of commencement of the Work, submit 3 copies of the product list. Provide a written explanation for omissions of data and variations from Contract requirements.

   3. The Architect will respond within 2 weeks of receipt of the list. No response within this period constitutes no objection to listed manufacturers or products but does not waive the requirement that products comply with Contract Documents. The Architect's response will include a list of unacceptable products.

E. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

   1. When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected.

F. Nameplates: Except for required labels and operating data, do not attach manufacturer's nameplates or trademarks on surfaces exposed to view in occupied spaces or on the exterior.
1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

   a. Name of product and manufacturer.
   b. Model and serial number.
   c. Capacity.
   d. Speed.
   e. Ratings.

G. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

   1. Schedule delivery as early as possible. Coordinate with installation to assure safety for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
   2. Deliver products in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   3. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
   4. Store products to facilitate inspection and measurement of quantity or counting of units. Store heavy materials away from the structure in a manner that will not endanger the supporting construction.
   5. Store products subject to damage by the elements aboveground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

1.2 PRODUCTS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.

   1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
   2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: Procedures governing product selection include the following:
SECTION 01600 - MATERIALS AND EQUIPMENT

a. Proprietary Specification Requirements: Where products are specified by name, accompanied by the term "or equal" or "or approved equal" comply with specified product standards and data to obtain approval for use of an unnamed product. See Specification Section 01300, "Submittals," page 01300-6 and 01300-7, Paragraph 2.1 for specific Substitution requirements.

2. Nonproprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning submissions to obtain approval for use of an unnamed product.

3. Descriptive Specification Requirements: Where Specifications describe a product, listing characteristics required, with or without use of a brand name, provide a product that provides the characteristics and otherwise complies with requirements.

4. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply and are recommended for the application. Manufacturer's recommendations may be contained in product literature or by the manufacturer's certification of performance.

5. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.

6. Visual Matching: Where Specifications require matching a Sample or existing building items, the Architect's decision on whether a product matches will be final.

7. Visual Selection: Where requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product that complies with other requirements. The Architect / Owner will select the color, pattern, and texture from the product line selected.

1.3 EXECUTION

A. Comply with manufacturer's instructions for installation of products. Anchor each product securely in place, accurately located and aligned with other Work. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01600
SECTION 01650 – GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1. DESCRIPTION

A. **Summary.** Commissioning is a systematic process of ensuring that all building systems perform interactively according to the design intent and the owner's operational needs. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training. The General Contractor is required to complete commissioning as a requirement for "substantial completion" prior to the contract completion date.

B. **Purpose.** Commissioning during the construction phase is intended to achieve the following specific objective according to the Contract Documents:

1. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted minimum standards and that they receive adequate operational checkout by installing contractors.
2. Verify and document proper performance of equipment and systems
3. Verify that O&M documentation left on site is complete.
4. Verify that the Owner's operating personnel are adequately trained.

C. **Scheduling and Coordination:** The General Contractor shall be responsible to manage, coordinate and schedule commissioning. The CA shall determine "substantial completion" of the work which must be established prior to the contract completion date. TAB and CX will take at least 30 days. The GC shall provide a schedule for this work for approval and track critical path items to assure the work is completed.

1.2. COORDINATION

A. **Commissioning Team.** The members of the commissioning team consist of the designated representative of the Owner, CM, Commissioning Authority (CA), the Architect and Design Engineers (particularly the mechanical engineer), the Mechanical Contractor (MC), the TAB representative, the Electrical Contractor (EC), the Controls Contractor (CC) and the Plumbing Contractor (PC). If known, the Owner's building or plant operator/engineer is also a member of the commissioning team.

B. **Management.** The CA has been hired by the Owner. The CA directs and coordinates the commissioning activities and is part of the design team. All members work together to fulfill their contracted responsibilities and meet the objectives of the Contract Documents.

C. **Scheduling.** The CA will work with the Cx team according to established protocols to schedule the commissioning activities. The CA will provide sufficient notice to the Cx team for scheduling commissioning activities. The GC shall integrate all commissioning activities into the master schedule. All parties will address scheduling problems and make necessary notifications in a timely manner in order to expedite the commissioning process.
1.3. COMMISSIONING PROCESS

A. Commissioning Process. The following narrative provides a brief overview of the typical commissioning tasks during construction and the general order in which they occur.

1. Commissioning during construction begins with a scoping meeting conducted by the CA where the commissioning process is reviewed with the commissioning team members.
2. Additional meetings will be required throughout construction, scheduled by the CA with necessary parties attending, to plan, scope, coordinate, schedule future activities and resolve problems.
3. Equipment documentation is submitted to the CA during normal submittals, including detailed start-up procedures.
4. The CA works with the CM, Prime Contractors and Equipment Suppliers in developing startup plans and startup documentation formats.
5. In general, the checkout and performance verification proceeds from simple to complex; from component level to equipment to systems and intersystem levels with pre-functional checklists being completed before functional testing.
6. The General Contractor, shall provide, execute and document the pre-functional checklists and perform startup and initial checkout. The CA documents that the checklists and startup were completed according to the approved plans. This will include the CA witnessing start-up of selected equipment.
7. The CA develops specific equipment and system functional performance test procedures. The General Contractor shall review the procedures.
8. The procedures are executed by the General Contractor, under the direction of, and documented by the CA.
9. Items of non-compliance in material, installation or setup are corrected at the Prime Contractors’ expense and the system retested.
10. The CA reviews the O&M documentation for completeness.
11. Commissioning is completed before Substantial Completion.
12. The CA reviews and coordinates the training provided by the General Contractor and verifies that it was completed.
13. Deferred testing is conducted, as specified or required.

1.4. RELATED WORK

A. Specific Commissioning (Cx) requirements are given in the following sections of these specifications. All of the following sections apply to the Work of this section:

15995 Mechanical Cx Facility Startup/Commissioning
1.5. RESPONSIBILITIES

A. The responsibilities of various parties in the commissioning process are provided in this section. The responsibilities of the Mechanical Contractor, TAB and Controls Contractor are in Division 15, and Electrical Contractor in Division 26. It is noted that the services for the Construction Management Firm, Architect, MEP Designers/Engineers, and Commissioning Authority are not provided for in this contract. That is, the Contractors are not responsible for providing their services. Their responsibilities are listed here to clarify the commissioning process.

B. All Parties

1. Follow the Commissioning (Cx) Plan.
2. Attend commissioning scoping meeting and additional Cx meetings, as necessary.

C. Owner

Design, Construction and Acceptance Phase

1. Manage the CA contract.

D. Mechanical, Electrical and Plumbing Designers/Engineers

Design, Construction and Acceptance Phase

1. Perform normal submittal review, construction administration. One site observation should be completed just prior to system startup.
2. Provide any design narrative and sequences documentation requested by the CA. The designers shall assist (along with the contractors) in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
3. Participate in the resolution of system deficiencies identified during commissioning, according to the contract documents.

E. Commissioning Authority (CA)

The CA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CA may assist with problem-solving non-conformance or deficiencies, but ultimately that responsibility resides with the Prime Contractors and the A/E. The primary role of the CA is to develop and coordinate the execution of a testing plan and observe/document performance. The Contractors will provide all tools or the use of tools to start, check-out and functionally test equipment and systems.

Design, Construction and Acceptance Phase

1. Coordinate the commissioning work and, with the CM, ensure that commissioning activities are being scheduled into the master schedule.
SECTION 01650 – GENERAL COMMISSIONING REQUIREMENTS

2. Plan and conduct a commissioning scoping meeting, start-up and deficiency meetings as required.
3. Request and review additional information required to perform commissioning tasks, including O&M materials, control sequences, contractor start-up and checkout procedures.
4. Before startup, gather and review the current control sequences and interlocks and write detailed testing procedures.
5. Review normal Contractor submittals applicable to systems being commissioned for compliance with commissioning needs.
6. Write and distribute pre-functional tests and checklists.
7. Perform site visits, as necessary, to observe component and system installations. Attends selected planning and job-site meetings to obtain information on construction progress.
8. Witness all or part of the HVAC/Plumbing piping test and flushing procedure, sufficient to be confident that proper procedures were followed. Document this testing and include the documentation in the Cx Report. Notify the CM of any deficiencies in results or procedures.
9. Approve pre-functional tests and checklist completion by reviewing pre-functional checklist reports and by selected site observation and spot-checking.
10. Approve systems startup by reviewing start-up reports and by selected site observation.
11. Review TAB execution plan.
13. Compile and maintain a commissioning record and building systems book(s).
14. Review and approve the preparation of the O&M manuals.
15. Provide a final commissioning report.

F. Equipment Suppliers

1. Provide all requested submittal data, including detailed start-up procedures and specific responsibilities of the Owner to keep warranties in force.
2. Assist in equipment testing per agreements with Prime Contractors.
3. Include all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment according to these Contract Documents in the base bid price to the Contractor. Through the contractors they supply products to, analyze specified products and verify that the designer has specified the newest most updated equipment reasonable for this project’s scope.
4. Provide information requested by CA regarding equipment sequence of operation and testing procedures.
5. Review test procedures for equipment installed by authorized factory representatives.
SECTION 01650 – GENERAL COMMISSIONING REQUIREMENTS

1.6. SYSTEMS TO BE COMMISSIONED

A. The following systems will be commissioned in this project:

    SYSTEM

    Central Building Automation System (BAS) for HVAC
    HVAC Primary Equipment and Systems
    HVAC terminal devices (20%)
    Verification of TAB Data
    Domestic Heating Hot Water System
    (Boiler/pumping system only)
    Lighting Control System

PART 2 – PRODUCTS – (NOT APPLICABLE)

PART 3 - EXECUTION

3.1. REPORTING

A. The CA will provide field reports to the Owner/CM as construction and commissioning progresses.

B. The CA will regularly communicate with all members of the commissioning team, keeping them apprised of commissioning progress and scheduling changes through memos and progress reports.

C. A final summary report by the CA will be provided to the Owner. All acquired documentation, logs, minutes, reports, deficiency lists, communications, findings, unresolved issues, etc., will be compiled in appendices and provided with the summary report. Pre-functional checklists, functional tests and monitoring reports will not be part of the final report, but will be stored in the Commissioning Record.

3.2. START-UP, PREFUNCTIONAL CHECKLISTS AND INITIAL CHECKOUT

A. The following procedures apply to all equipment to be commissioned, according to Section 1.6, “Systems To Be Commissioned.”

   1. Pre-functional checklist.
   2. Start-up: The start-up plan shall consist of:
      a. The CA’s prefunctional checklist.
SECTION 01650 – GENERAL COMMISSIONING REQUIREMENTS

b. The manufacturer’s standard start-up procedure
c. The manufacturer’s standard field check-out sheets.

B. Execution of Pre-functional Checklists and Startup.

1. The CA shall observe, at minimum, the procedures for each piece of primary equipment, unless there are multiple units. In no case will the number of units witnessed be less than 50% of the total number of identical or very similar units.

2. For lower-level components of equipment, (e.g., unit heaters, sensors, controllers), the CA shall observe a sampling of the pre-functional and start-up procedures. The sampling procedures are identified in the commissioning plan.

3. The Prime Contractors and vendors shall execute startup and provide the CA with a signed and dated copy of the completed start-up and pre-functional tests and checklists.

C. Deficiencies, Non-Conformance and Approval in Checklists and Startup.

1. The General Contractor shall clearly list any outstanding items of the initial start-up and pre-functional procedures that were not completed successfully, at the bottom of the procedures form or on an attached sheet. The procedures and any outstanding deficiencies are provided to the CA within two days of test completion.

2. The CA reviews the report and submits either a non-compliance report or an approval to the CM. The CA shall work with the Prime Contractors and vendors to correct and retest deficiencies or uncompleted items. The installing Prime Contractors or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner, and shall notify the CA as soon as outstanding items have been corrected and resubmit an updated start-up report. When satisfactorily completed, the CA recommends approval of the execution of the checklists and startup of each system.

3.3. FUNCTIONAL PERFORMANCE TESTING

A. This sub-section applies to all commissioning functional testing for all divisions.

B. The general list of systems to be commissioned is found in Section 1.6 of this specification.

C. Objectives and Scope. The objective of functional performance testing is to demonstrate that each system is operating according to the documented design intent and Contract Documents. Functional testing facilitates bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems. In general, each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required.
SECTION 01650 – GENERAL COMMISSIONING REQUIREMENTS

D. Development of Test Procedures. Before test procedures are written, the CA shall obtain all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, program code, control sequences and parameters. The CA shall develop specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Each Prime Contractor or vendor responsible to execute a test shall provide assistance to the CA in developing the procedures review. Prior to execution, the CA shall provide a copy of the test procedures to the Prime Contractors who shall review the tests for feasibility, safety, equipment and warranty protection.

E. Coordination and Scheduling. The General Contractor shall provide sufficient notice to the CA regarding their completion schedule for the pre-functional checklists and startup of all equipment and systems. The CA will schedule functional tests through the CM. The CA shall direct, witness and document the functional testing of selected equipment and systems. The Prime Contractors shall execute the tests.

In general, functional testing is conducted after pre-functional testing and startup has been satisfactorily completed. The control system is sufficiently tested and approved by the CA before it is used for TAB or to verify performance of other components or systems. The air balancing and water balancing is completed and debugged before functional testing of air-related or water-related equipment or systems. Testing proceeds from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems is checked.

3.4. DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TESTS

A. Documentation. The CA shall witness and document the results of all functional performance tests using the specific procedural forms developed for that purpose. Prior to testing, these forms are provided by the CA for review and approval and to the General Contractor for review.

B. Non-Conformance.

1. The CA will record the results of the functional test on the procedure or test form. All deficiencies or non-conformance issues shall be noted and reported to the CM.
2. Corrections of minor deficiencies identified may be made during the tests at the discretion of the CA.
3. Every effort will be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures. However, the CA will not be pressured into overlooking deficient work or loosening acceptance criteria to satisfy scheduling or cost issues, unless there is an overriding reason to do so at the request of the Owner.

C. Approval. The CA notes each satisfactorily demonstrated function on the test form. Formal approval of the functional test is made later after review by the CA.
SECTION 01650—GENERAL COMMISSIONING REQUIREMENTS

3.5. OPERATION AND MAINTENANCE MANUALS

The CA reviews the O&M manuals, documentation and redlined as-buils for systems that were commissioned to verify compliance with the Specifications.

3.6 TRAINING OF OWNER PERSONNEL

A. The General Contractor shall be responsible for training coordination and scheduling, and ultimately for ensuring that training is completed.

B. The CA shall be responsible for approving the content and adequacy of the training of Owner personnel for commissioned equipment.

3.7 DEFERRED TESTING

A. Unforeseen Deferred Tests. If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the Owner. These tests will be conducted in the same manner as the seasonal tests as soon as possible.

B. Seasonal Testing. During the warranty period, seasonal testing shall be completed as part of this contract. The CA shall coordinate this activity. Tests will be executed, documented and deficiencies corrected by the appropriate General Contractor, with facilities staff and the CA witnessing.

END OF SECTION 01650
<table>
<thead>
<tr>
<th>Activity</th>
<th>Owner</th>
<th>CM</th>
<th>A/E</th>
<th>CAA/TAB</th>
<th>PC/EC/MC</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Oversee Cx</td>
<td></td>
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<td></td>
<td></td>
<td>CA coordinates the Cx process, writes tests, oversees and documents performance tests, and helps to resolve Cx issues.</td>
</tr>
<tr>
<td>Design Intent/Basis of Design</td>
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<td>A/E is to provide information to CA to establish intent. If specified on project.</td>
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<tr>
<td>Prepare Cx Plan</td>
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<td>CA submits plan.</td>
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<td>Cx activities input to schedule</td>
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<td>2</td>
<td>1</td>
<td></td>
<td>Contractor revises schedule adding Cx activities. This includes scheduling of equipment startups.</td>
</tr>
<tr>
<td>Setup and document Cx meetings</td>
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<td></td>
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<td>2</td>
<td>Meetings can be called for resolution of items.</td>
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<tr>
<td>Provide equipment submittals for Cx</td>
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<td>CA is to request which submittals are required.</td>
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<tr>
<td>Review of equipment submittals for Cx issues</td>
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<td>2</td>
<td>CA is to provide any comments through A/E after review by Engineer.</td>
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<tr>
<td>Review TAB plan</td>
<td></td>
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<td></td>
<td>TAB plan/outline including BAS involvement is created by TAB sub per specification. Also, TAB is to supply procedures, draft reports and/or preliminary data.</td>
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<tr>
<td>Provide Manufacturers startup procedures</td>
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<td></td>
<td>This is required by CA for preparation of tests. CA can provide feedback.</td>
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<tr>
<td>Prepare pre-functional, functional, system,</td>
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<td></td>
<td></td>
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<td>2</td>
<td>CA is to prepare. EC/MC/PC can utilize manufacturer startup procedures for pre-functional and functional testing of equipment if documented. CA is to provide copy of Cx Book to EC/MC/PC. Test Forms can be revised at any time in process.</td>
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<tr>
<td>inter-system test forms</td>
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<td>Site Cx visits</td>
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<td>CA is to provide Cx report after periodic visits and maintain deficiency log.</td>
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<td>Review completed pre-functional tests</td>
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<td>PC/EC/MC is to provide completed forms/manufacturer procedures to CA shortly after testing. CA can spot witness pre-functional, functional testing and request additional testing if required.</td>
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<td>Perform functional, system, inter-system</td>
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<td>Cx team to understand there will be dedicated time to support functional testing even if the schedule does not show the activity.</td>
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<td>A/E</td>
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<td>PC/EC/MC</td>
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<td>Review TAB Report</td>
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<td>CA can spot witness and ask for additional testing, if required.</td>
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<td>Develop training</td>
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<td>PC/EC/MC is to develop syllabus and perform actual training</td>
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<td>syllabus</td>
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<td>Review training</td>
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<td>CA is to review and CM I document the actual training of Owner's personnel</td>
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<td>syllabus</td>
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<td>Reviews and recommends approval to the A/E.</td>
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<td>manuals/Warranties</td>
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**Key and General Descriptions of Roles**

General descriptions of the commissioning roles are as follows:

- **CM**: Construction Manager (N/A)
- **A/E**: Architect/Engineer- Perform construction observation, approve O&M manuals and assist in resolving problems
- **CAA/TAB**: Commissioning Agent- Coordinates the Cx process, writes tests, oversees and documents performance tests/ Testing and Balance Contractor
- **Subs**: Demonstrate proper system performance
- **Cx**: Commissioning
- **PC/EC/MC**: Plumbing Contractor/Electrical Contractor/Mechanical Contractor-

1: Primary Responsibility
2: Secondary Responsibility
1.1 GENERAL

A. Please refer to the "PROJECT CLOSEOUT CHECKLIST" at the end of this section for the summary of materials required to complete the contract obligation. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

B. Substantial Completion: The Contractor shall request the Owner, Construction Manager (if applicable) and Architect to inspect the job and perform a punch list to certify Substantial Completion. Refer to Specification Section AIA 201 General Conditions of the Contract for Construction, paragraph 9.8, for the definition of Substantial Completion. Before requesting inspection for certification of Substantial Completion, the Contractor shall complete the following:

1. “PUNCH LIST”: Before the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list (PUNCH LIST) of items to be completed or corrected. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

2. The Contractor shall perform a Quality Control / Quality Assurance QC/QA Punchlist of all work prior to requesting Substantial Completion and a punch list from the Owners Team. The Contractor’s Project Manager shall take the lead and conduct an onsite review with the Contractor’s superintendent and representation from every major sub prime contractor. Notification of this onsite walk thru shall be provided in writing to all members of the Owners Team who may or may not choose to attend. The Contractor’s Project Manager shall record and distribute this QC/QA Punchlist in a matrix that provides an additional column for the Contractor to document the completion of the work and the date. After successful completion of the Contractor’s QC/QA Punchlist and all work, the Contractor shall request the Owners Team perform a Punchlist. Substantial Completion shall be requested in accordance with paragraph 9.8.1 of Specification Section AIA 201 General Conditions of the Contract for Construction,

3. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the Work claimed as substantially complete.

   a. Include supporting documentation for completion and an accounting of changes to the Contract Sum.

4. Advise the Owner of pending insurance changeover requirements.

5. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

6. Submit record drawings, maintenance manuals, and, if specified elsewhere, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
SECTION 01700 - CONTRACT CLOSEOUT

7. Deliver tools, spare parts, extra stock, and similar items.
8. Changeover locks and transmit keys to the Owner.
9. Changeover temporary construction utilities to Owner including electric, water, gas, sewer, storm, fire protection, etc.
10. Complete startup testing of systems and instruction of operation and maintenance personnel. Remove temporary facilities, mockups, construction tools, and similar elements.
11. Complete final cleanup requirements, including touchup painting.
12. Touch up and repair and restore marred, exposed finishes.
13. Submit Certificate of Occupancy/Approval
12. Remove temporary covered walkway, fence, and complete all curbs, paving, concrete walks, etc.

C. Inspection Procedures: On receipt of a request for inspection, the Construction Manager will proceed or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

1. The Construction Manager (if applicable) or Architect will repeat inspection when requested and assured that the Work is substantially complete.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

D. Final Acceptance: Please refer to the “FINAL PAYMENT CHECKLIST” at the end of this section for the summary of materials required to complete the contract obligation. All “PROJECT CLOSEOUT CHECKLIST” items shall be completed before requesting Final Acceptance.

E. Reinspection Procedure: The Construction Manager will reinspect the Work upon receipt of notice that the Work has been completed, except for items whose completion is delayed under circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance. If the Work is incomplete, the Architect will advise the Contractor of Work that is incomplete or obligations that have not been fulfilled but are required.
2. If necessary, one (1) reinspection will be provided free of cost to the Contractor. If the Contractor fails to complete the work and a third or subsequent inspections are required, then the Contractor agrees to have the Liquidated Damages Daily Amount deducted from his Contract to pay for all extra inspections.

F. Record Document Submittals: Do not use record documents for construction. Protect from loss in a secure location. Provide access to record documents for the Construction Manager’s (if applicable) / Architect’s reference.
SECTION 01700 - CONTRACT CLOSEOUT

G. Record Drawings: Maintain a set of Original Signed and Sealed Prints of Contract Documents and Shop Drawings in the job trailer accessible to the Local Authority having jurisdiction, Owner, Construction Manager and/or Architect. The drawings shall be updated daily and subject to the penalty of non-payment if they are not up to date. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark the drawing most capable of showing conditions fully and accurately. Give attention to concealed elements.

1. Mark sets with red pencil. Use other colors to distinguish between variations in separate categories of the Work.
2. Organize record drawing sheets into manageable sets. Bind with durable-paper cover sheets; print titles, dates, and other identification on the cover of each set.

H. Record Specifications: Maintain one copy of the Project Manual, including addenda. Mark to show variations in Work performed in comparison with the text of the Specifications and modifications. Give attention to substitutions and selection of options and information on concealed construction. Note related record drawing information and Product Data.

1. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.

I. Maintenance Manuals: Organize operation and maintenance data into two (2) sets of manageable size. Bind in individual, heavy-duty, 2-inch (51-mm), 3-ring, binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. Include all the information required in the "PROJECT CLOSEOUT CHECKLIST." Project Closeout Checklist Documents including these Maintenance Manuals shall be delivered to the OWNER.

J. Record RFIs (Request for Information): The Contractor shall maintain a complete record of all RFIs in the job trailer accessible to the Local Authority having jurisdiction, Owner, Construction Manager and/or Architect. The RFI Log Book shall be updated daily and subject to the penalty of non-payment if it is not up to date.

1.2 PRODUCTS (Not Applicable)

1.3 EXECUTION

A. Operation and Maintenance Instructions: The Contractor shall coordinate and arrange for each Installer/Manufacturer to provide instruction in proper operation and maintenance to the Owner’s Staff. Refer to the applicable Specification Section for the requirements of Owner Instruction. The Architect and Engineer shall be notified of this instructional meeting 3 days in advance. The instructional meeting shall include a detailed review, but not be limited to, the following items:

1. Maintenance manuals.
2. Spare parts, tools, and materials.
3. Lubricants and fuels.
4. Identification systems.
SECTION 01700 - CONTRACT CLOSEOUT

5. Control sequences.
6. Hazards.
7. Warranties and bonds.
8. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following:

1. Startup and shutdown.
2. Emergency operations and safety procedures.
3. Noise and vibration adjustments.

C. Final Cleaning: Employ experienced cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Complete the following operations before requesting inspection for certification of Substantial Completion.

1. Remove labels that are not permanent labels.
2. Clean transparent materials, including mirrors and glass. Remove glazing compounds. Replace chipped or broken glass.
3. Clean exposed finishes to a dust-free condition, free of stains, films, and foreign substances. The Contractor shall clean vinyl composite tile, ceramic tile, terrazzo, sealed concrete, etc. “mop clean.” Strip all VCT flooring and apply three coats of wax. Vacuum carpeted surfaces.
5. Clean the site of rubbish, litter, and foreign substances. Sweep paved areas; remove stains, spills, and foreign deposits. Rake grounds to a smooth, even-textured surface.

D. Pest Control: Engage a licensed exterminator to make a final inspection and written report verifying the project is rid of rodents, insects, and other pests. This certification shall be included in the O & M manuals.

E. Removal of Protection: Remove temporary protection and facilities.

F. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials and dispose of lawfully.

G. Contractor shall provide an as-built survey of all installed utilities, as well as existing utility features to remain that are uncovered during construction, including locations and elevations. The as-built survey shall be provided as a hard copy plan sheet and in electronic format (AutoCAD or similar file type) on a CD, flash drive or similar acceptable electronic media.

END OF SECTION 01700
SECTION 01700 - CONTRACT CLOSEOUT

PROJECT CLOSEOUT CHECKLIST

* CONTRACTOR SHALL SUBMIT ALL ITEMS DIRECTLY TO OWNER.
CONTRACTOR SHALL FORWARD AN ELECTRONIC COPY OF THE
TRANSMITTAL ONLY TO ARCHITECT, CONSTRUCTION MANAGER OR CLERK
OF THE WORKS (IF APPLICABLE). TRANSMITTAL SHALL INCLUDE
DESCRIPTION OF CONTENTS AND SIGNED ACKNOWLEDGEMENT OF RECEIPT
FROM THE OWNER.

Complete,
Incomplete or
N/A ______

AS-BUILT DOCUMENTS - ONE SET per Building Location
* All As-Built Documents must be clearly labeled “AS-BUILT” with a
date and Contractor’s signature. If the Owner has contracted with a
Construction Manager, the Contractor must review all As-Built notations
with the C.M. prior to delivering to Owner.

1. Record “as-built” contract drawings. (1 paper copy & 2 PDF file disks to
Owner and 1 PDF file disk sent directly to the Architect)

2. Record “as built” shop drawings. (1 set)

3. Record “as-built” specifications document noting all substitutions. (1 set)

4. Certification that all products are “asbestos free”.

5. Utility “as-built” Survey drawing.

CLOSE-OUT BINDERS - TWO SETS per Building Location
* All items shall be in a 3-ring loose leaf binder, clearly labeled (minimum: building, discipline/trade & year) on Front and Side Spine. Include a helpful table of contents and index tabs.


* WARRANTY CLARIFICATION: Contractor shall separately identify any warranty that requires execution by Owner or otherwise. “Copies” of warranties should be included in the close-out “binder”. “Original” warranties requiring execution should be sent under a separate cover. The separate cover should clearly identify the action required to execute the warranty.

9. List of contact persons for the General Contractor and all sub-contractors. Include contract responsibility, name of company, name of person, street address, mailing address (if different), telephone and email address.

10. Testing and inspection log. (Pest Control Certification, if applicable)

11. Copy of final inspection reports.

12. Certificate of payment to all sub contractors and suppliers.

13. Special tools, spare parts, extra stock materials, etc. shall be turned over to Owner. Include list in closeout binder.

14. OWNER TRAINING VIDEO – ONE COPY per Building Location
**FINAL PAYMENT CHECKLIST**

*DO NOT submit Final Payment until all items can be included.*

**CONTRACTOR MUST COMPLETE AND SUBMIT (3) THREE SETS OF COLLATED, NOTARIZED ORIGINALS & (1) ONE COMPLETE ELECTRONIC COPY VIA EMAIL TO THE ARCHITECT WITH FINAL PAYMENT APPLICATION:**

1. Owner Payment Voucher (if required by Owner).

2. AIA Payment Application.

3. AIA Contractor’s Affidavit of Payment of Debts and Claims

4. AIA Contractor’s Affidavit of Release of Liens
   a. Prime Contractor’s Release of Liens may indicate that the release is conditional upon Final Payment (if applicable).

   b. SIGNED & NOTARIZED “RELEASE OF LIENS” FOR EACH AND EVERY SUBCONTRACTOR/VENDOR. The subcontractors’ and vendors’ Release of Liens must list the exact amount still owed to the referenced subcontractor/vendor. This amount must be consistent with or not exceed the amounts documented on your Application for Payment. Release of Liens simply stated as conditional upon Final Payment will not be accepted.

5. Contractor Certification of Completion

6. AIA Consent of Surety to Final Payment

7. Maintenance Bond for 100% of the Project Cost for a warranty period of two (2) years from the Date of Final Acceptance.

8. Certificate of Occupancy or Acceptance by the Local Construction Official.


10. The contractor shall not use any product containing asbestos. The contractor shall provide a notarized letter that no asbestos containing materials were provided on the project.
ADDITIONAL REQUIREMENTS TO BE SATISFIED PRIOR TO CERTIFICATION OF FINAL PAYMENT:

A. Project Closeout Documents (submit separately as indicated on requirement list enclosed)
SECTION 01740 - WARRANTIES AND BONDS

1.1 GENERAL

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1. Refer to the General Conditions for terms of the Contractor's period for correction of the Work.
2. Requirements for Warranties and Bonds for products and installations that are specified are included in the individual sections of these specifications.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

D. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

E. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

F. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefitted from use of the Work through a portion of its anticipated useful service life.

G. Owner's Recourse: Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
2. Where the Contract Documents require a special warranty, or similar commitment, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.
H. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion, submit written warranties upon request of the Architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within 15 days of completion of that designated portion of the Work.

I. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Architect, for approval prior to final execution.

1. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

J. Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (115-by-280-mm) paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.

2. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor.

3. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.2 PRODUCTS (Not Applicable)
1.3 EXECUTION (Not Applicable)
REPORT OF GEOTECHNICAL INVESTIGATION

PROPOSED WORKFORCE DEVELOPMENT CENTER & MEDICINE CENTER BUILDINGS

ROWAN COLLEGE @ GLOUCESTER COUNTY
TANYARD ROAD
DEPTFORD TOWNSHIP
GLOUCESTER COUNTY, NEW JERSEY

Prepared For: Greyhawk
2000 Midlantic Drive, Suite 210
Mt. Laurel, New Jersey 08054

EEI Project No. 31381.J0

January 24, 2019
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## APPENDIX

SITE LOCATION MAP
TESTING LOCATION PLAN
TEST BORING & TEST PIT PROFILES
BORING LOGS
SOIL DESCRIPTION LOGS
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LABORATORY TEST RESULTS
I. INTRODUCTION

Earth Engineering Incorporated (EEI) has completed the Geotechnical Investigation for construction of the proposed new Workforce Development Center and Medicine Center buildings at the Rowan College at Gloucester County Campus in Deptford Township, Gloucester County, New Jersey. The objective of this project has been to investigate, document, and analyze the subsurface conditions present at the site. Based on the conditions encountered and the results of the testing performed for this project, EEI has developed geotechnical recommendations to aid in the design and construction of the proposed improvements, as well as general earthwork and construction guidelines for the development of this site.

This study was performed in general accordance with EEI’s Proposal No. WB-6948 (Revision #1), dated December 11, 2018. The scope of work for this project included a test boring investigation, geologic analysis of site conditions, laboratory testing of soil samples, infiltration testing program, and a geotechnical engineering analysis of the data obtained. The following report sections present the results of our field and laboratory investigations and documents our recommendations regarding the geotechnical engineering aspects of this project.

II. PROJECT DESCRIPTION

According to information and site plans provided by Federici & Akin, P.A. Consulting Engineers, the project will consist of the construction of two (2) new campus buildings. The Workforce Development building is expected to be on-story in height and measure approximately 15,654 square feet (s.f.) in plan area. The Medicine Center building is expected to be two-stories in height and measure approximately 29,415 s.f. in plan area. Each building is expected to be constructed using conventional steel and masonry construction methods and feature a concrete slab situated on-grade. Planned development of the site will also include the construction of a
stormwater management system, parking and driveway lanes, along with concrete curbing and sidewalks.

Information provided within the project’s Request For Proposal For Geotechnical Investigation indicates maximum column and wall loads for the Workforce Development Center and Medicine Center buildings are estimated to not exceed 160 kips and 2.3 kips per linear foot, respectively. Final site grading information was also not available at the time of this report. However, based on current site grading, the finished floor elevations of the proposed buildings are expected to be situated at or near existing site grades.

III. SITE DESCRIPTION

The project site is located off of Tanyard Road within a portion of Rowan College at Gloucester County campus in Deptford Township, Gloucester County, New Jersey. The project site is referenced on the Local Tax Map as part of Block 417, Lot 1. The site is bordered to the east by the Rowan College at Gloucester County campus, and to the north by athletic fields associated with the campus. Tanyard Road borders the site to the west, with the southern perimeter of the site formed by Gloucester County Education building facilities. The general location of the project site is presented on the Site Location Map included within the Appendix.

The surface of the site is grass and weed covered, with sparse trees located along the western perimeter of the site. The site also features a partially paved local access road and newly a constructed stormwater basin located within the southern portion of the site. It is noted that multiple site utilities, including but not necessarily limited to electric and storm water, traverse the proposed project site area.

The ground surface in the area of the proposed site improvements appears to slope slightly downward from northwest to southeast. Maximum relief across the proposed construction area is estimated to be less than 3 feet.
The locations of the planned new building structures, relative to the existing roadway, are shown on the Testing Location Plan, EEI Drawing No. 31381.J0-A-101, included in the Appendix of this report.

IV. FIELD INVESTIGATION

A series of twelve (12) standard earth borings, reference B-1 through B-12, were conducted at the project site on January 9 and 10, 2019 by F.M. & W. Drilling Company of Bellmawr, New Jersey. Test borings B-1 and B-2 were performed within the general footprint of the proposed Workforce building, with test borings B-3 through B-7 performed within the general footprint of the proposed Medicine Center building. Each of these test borings extended downward to depths of approximately 25.0 feet below the existing ground surface. The remaining test borings, B-8 through B-12, were performed within planned parking/drive lane areas of the site and extended downward to depths of approximately 10.0 feet below the existing ground surface.

The test borings were advanced using a truck mounted drill rig equipped with hollow stem augers and split spoon samplers. Split-spoon samples, conducted in accordance with ASTM standard D1586, were taken at regular intervals throughout the depth of the borings. Standard Penetration Test (SPT) values were recorded for each sample. The SPT values, which are a measure of soil density and consistency, are the number of blows required to drive a 2-inch (outer diameter) split-barrel sampler one foot using a 140-pound weight dropped 30 inches. The number of blows required to advance the sampler over the 12 inch interval from 6 to 18 inches is considered the "N" value, or the SPT value which is recorded on the boring profiles, Sheets 1 through 3, included in the Appendix. Test boring logs containing sample depths, descriptions of the materials encountered, and SPT values are also included in the Appendix.
In addition to the test borings, three (3) exploratory test pits, designated as TP-1 through TP-3, were performed in areas of the site under consideration for the construction of stormwater management facilities. The test pits were excavated on December 20, 2018 by G-Boys Excavating Inc., of Hammonton New Jersey, utilizing a Komatsu PC200 Trackhoe. In-situ double ring infiltration testing was performed at each of the test pit location to obtain infiltration rates of the subgrade soils.

The details and results of the infiltration testing are provided in Infiltration Testing section of this report. Graphical representation of the test pits can also be found on the Test Pit Profiles, Sheet 4, included in the Appendix.

The test borings and test pits were field located by scaling and measuring distances from marked up site plans provided by Federici & Akin, P.A. Consulting Engineers. Supervision and monitoring of the test boring, test pit, and infiltration testing program were provided by a representative of Earth Engineering Incorporated. The relative location and corresponding number of each boring, test pit, and infiltration test, relative to the existing and proposed site features, is shown on the Testing Location Plan, included in the Appendix.

V. LABORATORY TESTING

All soil samples were taken to EEI's soils laboratory and visually classified by our engineers. In addition to visual classification, two (2) representative soil samples recovered from the subsurface investigation were subjected to laboratory analysis. The laboratory testing conducted on the samples consisted of standard classification testing, in accordance with ASTM standard D2487, to verify visual classifications and to establish engineering parameters required for foundation design analysis. The tests performed included Particle Size Analysis (ASTM D422), Atterberg Limits Determination (ASTM D4318), and Natural Moisture Content (ASTM D2216).

Unified Soil Classification System (USCS) Group Symbols and ASTM Group Names have been assigned to the soil samples based upon the laboratory testing. The results of the testing
conducted are presented below in Table I. Gradation curves, graphically depicting the results of the particle size analyses, are presented in the Appendix.

<table>
<thead>
<tr>
<th>TABLE I - LABORATORY TEST RESULTS</th>
</tr>
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<tbody>
<tr>
<td>Boring Location</td>
</tr>
<tr>
<td>Sample Number</td>
</tr>
<tr>
<td>Sample Depths</td>
</tr>
<tr>
<td>Stratum</td>
</tr>
<tr>
<td>Particle Size Distribution</td>
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<tr>
<td>1.5&quot;</td>
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<tr>
<td>3/4&quot;</td>
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<tr>
<td>3/8&quot;</td>
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<tr>
<td>No. 4</td>
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<tr>
<td>No. 10</td>
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<td>No. 40</td>
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<tr>
<td>No. 100</td>
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<tr>
<td>No. 200</td>
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<td>Atterberg Limits</td>
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<tr>
<td>Liquid Limit</td>
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<tr>
<td>Plastic Limit</td>
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<tr>
<td>Plasticity Index</td>
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<tr>
<td>Natural Moisture Content (percent)</td>
</tr>
<tr>
<td>Unified Soil Classification System (USCS) Group Symbol</td>
</tr>
<tr>
<td>ASTM Group Name</td>
</tr>
</tbody>
</table>

VI. SUBSURFACE CONDITIONS

A. Geology

According to the New Jersey Geological Survey Open-file Map, Bedrock Geological of the Woodbury Quadrangle, Gloucester County, New Jersey, 2004, the area of investigation lies within a geologic structural region known as the Coastal Plain. The Coastal Plain consists generally of poorly consolidated sediments of Tertiary and Cretaceous age. The geologic formation of the
Coastal Plain sediments within the area of the project site is known as the Kirkwood Formation, Lower Member (geologic symbol - Tkw). The upper sand facies of this formation consists predominately of sand, typically fine to medium grained, massive to thick-beded, locally cross-beded, light-yellow to white, locally very micaceous and extensively stained by iron oxides in near surface beds. The thick-beded strata commonly consists of interbedded fine-grained, micaceous sand and gravelly, coarse to fine grained sand. The lower clay facies consists of clay and clay-silt, massive to thin-beded, dark gray, micaceous, containing wood fragments, flattened lignitized twigs, and other plant debris.

Based upon the soil samples obtained from the site, residual soils encountered within the test borings and test pits are characteristic of the Kirkwood Formation described above.

B. Soils

The surface of the site at each test location was covered by a layer of topsoil ranging from approximately 3.0 to 12.0 inches in thickness. It must be noted that the determination of topsoil was a cursory field evaluation not supported by laboratory testing. The ability of the topsoil to support plants and vegetation was not determined and is not implied by EEI. In addition, the depth or thickness of topsoil is expected to vary across the project area and may differ from that stated above.

Each of the soil samples recovered from the field investigation was examined and visually classified by EEI. One (1) material described as FILL and one (1) naturally occurring soil stratum were observed at this site. Cross-sections of the test borings and test pits, displaying the various strata and other information obtained from the field investigation are included on the test boring and test pit profiles. The test boring and test pit information is further detailed on the boring logs and soil description logs also included in the Appendix. A general description of the materials encountered is as follows:
FILL

The material designated as FILL is visually described as brown to light brown to greenish brown fine to medium SAND, and to some silt. Visual evaluation performed on the FILL indicates this material is marginally granular and non-plastic. The FILL was encountered immediately below the surficial topsoil and extended downward to depths ranging from approximately 2.0 to 6.0 feet below the existing ground surface. This material appears to represent soil placed during initial site grading activities.

The SPT values recorded while sampling this material range from weight of hammer (WOH) to 17 blows on the sampling barrel per foot of penetration. Based on the SPT values, the FILL exists in a very loose to medium dense state.

STRATUM I

The soil designated as Stratum I is visually described as brown to greenish brown to gray fine to medium SAND, and to little silt, some to no clay, trace gravel. As determined by laboratory testing, the USCS Group Symbol for representative samples of this soil is SM. The assigned ASTM Group Name for the samples tested is Silty Sand. Laboratory testing indicates portion of the Stratum I soils are marginally granular, possessing a plasticity index of 26 with an as received moisture content 24.5 percent. Although laboratory testing has determined that portions of Stratum I possess a plasticity index of 26, the table classification for fine-grained soil and fine-grained fractions of coarse-grained soils indicates this material plots below the “A” Line on published plasticity charts, and therefore, classifies as a silty sand (SM). Stratum I was encountered in each test boring and test pit immediately below the surficial topsoil or FILL material and extended downward to the termination depths of the testing locations which ranged from approximately 10.0 to 25.0 feet below the existing ground surface.
SPT values recorded while sampling this soil type ranged from 4 blows on the sampling barrel per foot of penetration to 85 blows on the sampling barrel per 11.0 inches of penetration. Based on this range of values, the Stratum I soil exists in a very loose to very dense state.

C. Bedrock

The bedrock surface, as defined by auger refusal, was not encountered to the depths achieved during the field investigation.

D. Groundwater

The static groundwater level was encountered in three (3) of the test borings and each of the three (3) of the test pits performed for this investigation at depths ranging from 6.0 to 19.0 feet below the existing ground surface. Subsequent readings performed after completion of the test borings showed groundwater depths ranging from 6.3 to 11.1 feet below the existing ground surface. Mottling of the soils, which could be an indication of a seasonal high groundwater condition was encountered in test boring B-5 and each test of the three (3) test pits performed during the investigation at depths ranging from 5.1 to 10.5 feet below the existing ground surface. It should be noted that these observations were made at the time of the drilling operation and that groundwater table elevations may fluctuate with daily, seasonal, and climatic variations.

Based on existing and proposed site grading, excavations associated with foundation construction are not expected to encounter groundwater. However, excavations associated with deep utility construction will approach and may extend below the groundwater levels encountered during the field investigation. Consequently, groundwater control measures may be required during site construction activities. Measures to minimize the impact of any infiltrating groundwater into excavations during construction are discussed in the Groundwater Control section of this report.
VII. EXISTING UTILITIES

Existing utilities situated in the area of the proposed improvements should be completely removed from and rerouted outside the area of planned construction. The base of all excavations resulting from the removal and/or relocation of existing utilities should be proof-rolled to confirm stability prior to backfilling. Upon confirmation of a stable soil subgrade, the excavations performed to remove existing site features can be backfilled with controlled compacted lifts of structural fill as detailed in the Fill and Compaction section.

VIII. SITE PREPARATION

In addition to the removal of the existing utilities, initial site preparation measures should include the complete removal of all surficial materials including concrete sidewalk, curbing, asphalt, stone subbase and all organics, including topsoil and root mass extending a minimum distance of 5 feet beyond the proposed construction areas. Based on the anticipated construction, minimal cuts and fill placement will be required to achieve the construction slab subgrade elevation. Following excavation to achieve proposed grade and/or prior to the placement of structural fill, the proposed building areas should be proof-rolled and compacted. It is recommended that a steel drum vibratory roller having a minimum static weight of 10 tons be utilized for this purpose.

Proof-rolling and compaction procedures are necessary to compact and verify the integrity of the upper zones of the soils. Soft/loose zones of soil attributed to excessive soil moisture, if any, can be aerated and dried in-place. Aeration and drying of excessively moist soil are best accomplished in warm dry summer months. Following adequate drying time, the soils can be densified in-place. Alternately, any soft/loose zones of soil can be removed and replaced with structural fill, as outlined in the Fill and Compaction section of this report. The proof-rolling effort should be observed and evaluated by a qualified representative of the Geotechnical Engineer of Record.
The site should be graded during construction to direct surface runoff away from the construction areas. Proper grading and management of surface runoff will help minimize disturbance of the subgrade. Additionally, work areas should be sealed on a daily basis. Furthermore, EEI recommends that all construction areas, including those which are excavated to achieve the planned subgrade elevation, be proof-rolled immediately prior to the placement of subbase stone and again prior to the concrete floor and asphalt pavement section. This will allow for loose and weak areas to be observed and remediated.

Site development during the wet Fall, Winter, and Spring months, will likely require subgrade stabilization consisting of soil over-excavation and replacement utilizing select structural fill throughout significant portions of the building and paved areas. The need to excavated and replace the soft/loose and excessively moist materials will be reduced if development of the site occurs during periods of dry and warm conditions, such as the summer months. During these periods, scarifying and aeration will be greatly enhanced, while reducing the need to over-excavate and replace soft soils. **If this site is developed during the Fall, Winter, or Spring months, significant cost and time contingencies should be provided in the project budget for building pad and pavement subgrade stabilization.**

**IX. FOUNDATION DESIGN RECOMMENDATIONS**

The results of the field investigation, supported by laboratory testing, revealed that the general geotechnical cross-section within the area of investigation consists of the generally very loose to medium dense, primarily granular and non-plastic FILL, underlain by the very loose to very dense, marginally granular to marginally fine-grained, non-plastic to moderately-plastic Stratum I soils. At the time of this report, no documentation was available on the variable density in-place FILL material encountered during the investigation. Supporting structures on undocumented FILL is considered contrary to industry standards. Furthermore, engineering analysis of the site conditions
indicates that settlements above tolerable limits are expected if conventional shallow foundations are placed on or above the in-place FILL. Based on the subsurface conditions encountered during the field investigation, it is the opinion of EEI that the proposed new buildings may be supported on conventional shallow strip and spread foundation systems provided the footings are situated within suitably dense natural soils of Stratum I or structural fill placed under engineering control.

At the time of this report, finished floor elevations for the Workforce Development Center and Medicine Center buildings were not yet available. However, for the purposes of analysis within this report, EEI has estimated that finished floor elevations for the buildings will be set at or near existing site grades. Anticipated foundation construction for the buildings will situate foundation elements within the natural soils of Stratum I at the majority of the test boring locations.

Review of the boring data indicates that undocumented FILL material encountered in test boring B-6 extends downward to a depth of approximately 6.0 feet below existing site grade. Typical foundation construction will likely situate foundation elements within the in-placed FILL. As a result, localized undercutting of the foundations and replacement should be performed where FILL material is encountered at the foundation subgrade elevation. It is anticipated that approximately 3.0 feet of in-place FILL will require removal in the area of B-6. The depth of undercut referenced is provided only as a guide. In the event that unsuitable conditions are encountered at the base of the proposed undercut depth, the excavation should continue until a stable subgrade is encountered. Resulting over-excavations may be backfilled with approved structural fill placed under engineering control or a lean concrete mix.

Following removal of all FILL material, the resulting excavated subgrade should be proof-rolled and compacted. Due to space constraints, a walk-behind dual-drum vibratory roller (ram-max) should be utilized for this operation. Any loose or unstable natural soils encountered during proof-rolling resulting from excessive soil moisture should be aerated, dried, and densified in-place or removed and replaced with structural fill. Loose soils that cannot be densified in place should be
undercut a minimum depth of one (1) foot below the foundation bottom elevation and remediated in accordance with the stabilization process referenced in the *Groundwater Control* section of this report. Upon confirmation of a stable subgrade, fill placement to achieve the desired foundation bottom and/or slab subgrade elevation should be performed with controlled compacted lifts of Dense Graded Aggregate (DGA) or equivalent structural fill as detailed in the *Structural Fill* section of this report. The lateral extent and depth of the all unsuitable material requiring removal and replacement during the foundation undercut should be confirmed in the field by a qualified representative of the Geotechnical Engineer of Record during site preparation activities.

Following proper site preparation procedures, properly placed structural fill and/or the natural soil will be capable of supporting the proposed structures utilizing a shallow foundation system. The following foundation system and soil bearing capacity recommendations are provided by EEI assuming that the procedures stated above and specifications presented below are followed.

1. Following localized undercutting and backfill, a foundation system consisting of strip and/or spread footings with a slab-on-grade is recommended for support of the proposed buildings.

2. The foundations should be supported on the suitably dense soils of Stratum I and/or properly placed structural fill provided the foundation is thoroughly compacted using a dual-drum sheep's foot vibratory trench roller. **New Foundation elements shall not bear on or above existing FILL materials, remnant structural elements, and/or utilities.**

3. Following successful completion of the localized undercutting and backfill, the structure foundations can be designed for an allowable bearing capacity of 3,000 pounds per square foot. Regardless of the load criteria, a minimum 2.0 foot wide strip footing and 4.0 foot spread footing should be utilized.

4. Total foundation settlement for the buildings is estimated at 1.0 inches, with differential settlements estimated at 0.50 inches. These settlements were calculated using a bearing pressure of 3,000 pounds per square foot, along with a maximum column load of 160 kips and a maximum wall load of 2.3 kips per linear foot. Should the anticipated loads be different, EEI should be notified so that our recommendations can be reviewed and revised, if necessary.

5. The bottom of exterior footings and footings in unheated areas should be placed at least 3 feet below the final exterior grade for protection from frost heave.
6. All footing bottoms should be completely cleaned of loose material or debris immediately prior to the placement of concrete.

7. The actual bearing conditions of the soil at the footing bottom elevation should be confirmed in the field during excavation, by inspection under the supervision of a Professional Engineer qualified in Geotechnical Engineering.

X. EXCAVATION METHODS

Excavation required to achieve building foundation subgrade elevations and for installation of associated utilities will occur within the FILL material and natural Stratum I and Stratum II soils. The bedrock surface, as defined by auger refusal, was not encountered in test borings to the depths achieved during the field investigation.

Support of the soils beneath any adjacent existing structural elements, roadways, sidewalk and/or utilities must be maintained during building improvement construction and foundation excavation to prevent settlement of these structures. Therefore, at no time shall the soils below the existing adjacent footings be left unsupported. If foundation excavation extends below existing adjacent foundation elements, then shoring and bracing of the excavation sidewalls adjacent to the existing buildings will be required to maintain support of these soils. Alternately, the existing foundation elements can be underpinned.

The actual need and design of a shoring or underpinning system will be based on the existing foundation bottom elevation and the material type below the existing foundation elements. It is noted that the design of the shoring or underpinning system necessary to provide support of the existing foundation elements is beyond the scope of this report.

Excavations must be sloped, benched or shored to prevent collapse during soil excavation and provide a safe working environment. Sloping, benching, or shoring of all construction excavation should be conducted in accordance with 29 CFR 1926, Subpart P. A competent person as defined by the aforementioned regulation is required to confirm the stability of all excavations during
construction. The actual excavation wall slopes, benching, or shoring should be field determined and should be based on the required depth of excavations and on the soil types encountered.

XI. GROUNDWATER CONTROL

As previously stated, excavations associated with deep utility construction are expected to approach and may extend below recorded groundwater levels. If encountered, EEI anticipates that seepage will be controllable using submersible pumps positioned within the excavation. Sump pits at the base of the excavation may also be used. Dewatering should be based on standard practices and on the flows encountered at the time of construction. The final number and positioning of pumps required to dewater the excavation should be made by the contractor, subject to review by the Engineer.

The contractor should be prepared to provide adequate dewatering in order to maintain the integrity of the subgrade soils during excavation. If water accumulation occurs at the construction elevation, softening of the bearing surface will likely occur and require subgrade stabilization. If stabilization is required, it is expected to consist of a 1.0 to 2.0 foot over-excavation of loose/unstable soil, or more, depending on conditions. The over-excavated soils should be replaced with a minimum of 12.0 inches of 4-inch aggregate stone up to an elevation above encountered groundwater, then capped with approved structural fill placed under engineering control. This process will require the immediate placement of the aggregate stone after the unsuitable soils are excavated. Additionally, it is recommended that a track-hoe be utilized to perform the excavation so that the excavation can be performed from outside the subgrade area requiring stabilization. The stabilization process should be performed under the direction of the Geotechnical Engineer of Record.
XII. FILL AND COMPACTION

A. Fill Criteria

Fill material which supports foundations, floor slabs, and paved areas, in addition to material used for retaining wall backfill is considered structural fill. Excavation necessary for foundation construction is expected to make the FILL and natural soils of Stratum I available for use as structural fill.

In general, the FILL and Stratum I soils are considered suitable for use as structural fill. Laboratory testing and visual observation performed on representative samples of Stratum I indicates this soil ranges from primarily granular to marginally granular and non-plastic to moderately-plastic. Due to the abundance of finer-grained material comprising Stratum I, significant difficulties achieving the required densities and compaction percentage values will be realized if these soils are utilized as structural fill during the cool, wet Fall, Winter, and Spring months. Based on the elevated moisture content, plasticity index, and clay content of the finer-grained portions of Stratum I, these materials are not considered an ideal source of soil for use as structural fill within building and driveway areas. If large portions of these finer-grained plastic materials are made available for use as fill during construction, these materials should be blended with a predominately granular soil matrix prior to backfill placement. EEI recommends the suitability of this material, and all material generated from site development, be further evaluated during construction activities by a qualified representative of the Geotechnical Engineer of Record.

Furthermore, soil containing significant organics or deleterious materials, if any, should be stockpiled separately and used in non-structural areas of the site or disposed of properly. EEI recommends the suitability of this material be further evaluated during construction activities by a qualified representative of the Geotechnical Engineer of Record.

Excessively moist portions of the on-site soils that are suitable for use as structural fill will require significant time for aeration and drying to achieve the required densities and percentage
compaction values. Aeration and drying of excessively moist soil are best accomplished during warm dry summer months.

The on-site soils will require careful moisture control as portions are fine-grained and sensitive to moisture changes. Materials stockpiled for use as structural fill should be graded to shed water and rolled to maintain the soils. During periods of wet site conditions, travel upon the construction areas should be limited to minimize disturbance of the subgrade which will lead to instabilities.

No other significant sources of structural fill material are present at the site. If necessary, EEI recommends that a borrow source with a granular soil be established, or a modified crushed aggregate, such as NJDOT dense graded aggregate, be utilized for filling purposes at this site. Any structural or load-bearing soil for use is the building area, which is required to be imported to the site, should meet the following criteria:

- Granular soils such as GW, GP, GM SW, SP or SM as classified by ASTM D2487 are preferred, however soils having soil classifications GC, SC, ML or CL may be acceptable provided the Geotechnical Engineer of Record approves the soil;
- the largest particles within the fill should be no greater than 3 inches in diameter;
- not include deleterious materials such as construction debris, wood, glass, ash, trash, refuse, roots and other organic matter or contain frozen clumps of soil, snow or ice and
- have moisture contents within 3 percent of the soil’s optimum moisture content

The above criteria are provided as a general guideline for soil materials to be imported to the site. Soil materials available for use as a structural fill should be submitted to the Geotechnical Engineer of Record for evaluation and subsequent consideration prior to its importation to the site.

**B. Compaction Criteria**

Structural fill should generally be placed in horizontal lifts not exceeding ten (10) inches in loose thickness and compacted with a minimum ten-ton steel-drum, smooth-barrel vibratory roller. Fill material should generally be placed in horizontal lifts not exceeding six (6) inches in loose thickness where compaction by hand-operated equipment is necessary. The optimum lift thickness
and number of repetitions necessary to achieve the required percentage compaction values should be determined in the field with test passes of the chosen compaction equipment. All fill material should be placed at the optimum moisture content ±3% in accordance with ASTM modified D1557 and compacted to a minimum percentage of the maximum dry density as indicated in Table II.

<table>
<thead>
<tr>
<th>Fill Area</th>
<th>Percent of Maximum Dry Density per ASTM D1557</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation Bearing and Slab-On-Grade Areas</td>
<td>95</td>
</tr>
<tr>
<td>Pavements</td>
<td>95</td>
</tr>
<tr>
<td>Non-Structural</td>
<td>92</td>
</tr>
</tbody>
</table>

**XIII. GENERAL SOIL PROPERTIES**

**A. Lateral Earth Pressures**

The lateral earth pressures that may be used for design purposes of retaining walls or walls constructed below grade are shown in Table III. Retaining walls which are restrained from deflection such as loading dock, basement, or other structure walls, should be designed for the at rest (Ko) condition. Retaining walls which are free to deflect such as landscaped walls should be designed for the active (Ka) condition. The data for the FILL and natural Stratum I and Stratum II soils was determined based upon standard classification testing and/or visual classification of the site soil samples compared to generally accepted published values for the various properties.

It is recommended that a drainage system be installed for walls constructed below grade. The presence of a drainage system will serve to minimize hydrostatic pressures caused by water trapped against the walls.
### TABLE III - Soil Properties For Computation of Lateral Loads

<table>
<thead>
<tr>
<th>Soil Property</th>
<th>FILL</th>
<th>Stratum I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle of Internal Friction</td>
<td>28.0°</td>
<td>30.0°</td>
</tr>
<tr>
<td>Coefficient of Active Earth Pressure - $K_a$</td>
<td>0.36</td>
<td>0.33</td>
</tr>
<tr>
<td>Coefficient of Passive Earth Pressure - $K_p$</td>
<td>2.77</td>
<td>3.00</td>
</tr>
<tr>
<td>Coefficient of At Rest Earth Pressure - $K_s$</td>
<td>0.53</td>
<td>0.50</td>
</tr>
<tr>
<td>Coefficient of Sliding Friction</td>
<td>0.35</td>
<td>0.38</td>
</tr>
<tr>
<td>Moist Unit Weight (pcf)</td>
<td>115.0</td>
<td>120.0</td>
</tr>
</tbody>
</table>

#### B. Seismic Design Criteria

According to the 2009 International Building Code IBC Section 1615.1.1 Site Class Definitions, and based on data from the borings and calculations performed by EEI, the average properties in the top 100 feet correspond to Site Class D.

#### XIV. INFILTRATION TESTING

**A. Exploratory Test Pits and Test Boring**

As part of the field investigation, three (3) exploratory test pits were performed in areas of the site under consideration for the construction of stormwater management basin facilities. The purpose of the exploratory test pits was to investigate for potential limiting zones below proposed infiltration depths. Soil description and boring logs providing the depth, thickness, and descriptions of the materials encountered are included in the Appendix. A limiting zone is defined as a horizon or condition of the soil or underlying strata which includes:

A. Seasonal high water table, weather-perched or regional, determined by direct observation of the water table or soil mottling.

B. Rock with open joints, fractures or solution channels, masses of loose rock fragments including gravel, with insufficient fine soil to fill the voids between the fragments.
C. Rock formation, other stratum, or soil condition which is so slowly permeable that it effectively limits the downward passage of effluent.

The soils encountered within each test location were visually classified and documented in the field during the investigation by a representative of EEI. A generalized natural soil profile consisting of sandy loam to loam to loamy sand with varying amounts of gravel was concluded by EEI. The bedrock surface, which represents a limiting zone, was not encountered in any of the test pits performed during the field investigation.

An initial groundwater level was encountered in each of the three (3) of the test pits at depths ranging from approximately 8.2 to 11.8 feet, with subsequent readings ranging from approximately 7.5 to 11.1 feet below the existing ground surface. It should be noted that the groundwater observations were made at the time of the field investigation and that groundwater table elevations may fluctuate with daily, seasonal, and climatic variations.

Soil mottling, which may be an indication of seasonal high groundwater, was observed in each of the three (3) test pits at depths ranging from approximately 7.3 to 10.5 feet below the existing ground surface. The depths to soil mottling are detailed on the Soil Description Logs located in the Appendix.

As determined by laboratory testing, the ASTM Group Name for a representative samples of the Stratum I is Silty Sand, USCS Group Symbol SM. This soil was found to range from non-plastic to moderately-plastic and described as ranging from a Sandy Loam to Loam to Loamy Sand with varying amounts of gravel (USDA). Typically, the fine grained non-plastic to moderately-plastic soil would likely be designated as a limiting zone. However, soils encountered in test pit TP-1 yielded infiltration rates ranging from approximately 22.50 to 24.75 inches per hour. Additionally, soils encountered in test pit TP-3 at a depths of 4.0 feet below the existing grounds surface yielded infiltration rates ranging from approximately 1.50 to 2.75 inches per hour. Based on the infiltration rates obtained at this test location, the entirety of this soil does not represent a limiting zone.
The following table summarizes the type and depth of limiting zones encountered during the field investigation. Additional details regarding the soils and limiting zones are provided on the Soil Description Logs included in the Appendix.

<table>
<thead>
<tr>
<th>Test Location</th>
<th>Limiting Zone Condition</th>
<th>Depth of Limiting Zone(s) (ft.)</th>
<th>(1) Depth of Infiltration Test (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP-1</td>
<td>Fine Grained Soil</td>
<td>0.6 - 2.5</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>Soil Mottling</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td>TP-2</td>
<td>Fine Grained Soil</td>
<td>1.0 - 2.1</td>
<td>4.0 &amp; 5.5</td>
</tr>
<tr>
<td></td>
<td>Soil Mottling</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
<td>8.2</td>
<td></td>
</tr>
<tr>
<td>TP-3</td>
<td>Fine Grained Soil</td>
<td>0.9 - 1.8</td>
<td>4.0 &amp; 6.0</td>
</tr>
<tr>
<td></td>
<td>Soil Mottling</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Groundwater</td>
<td>11.8</td>
<td></td>
</tr>
</tbody>
</table>

(1) – Indicates depth of infiltration test performed below existing site grade. Infiltration test depths were determined based on limiting zones encountered during the investigation and discussions with Federici & Akin P.A.

**B. Infiltration Testing**

Following completion of the exploratory testing, double ring infiltration tests were performed adjacent to the test pits by EEI to determine infiltration rates for the on-site soils. The infiltration testing was performed at depths ranging from 4.0 to 6.0 feet below the existing ground surface. All testing procedures and calculations were performed in general accordance with Appendix E of the New Jersey Stormwater Best Management Practices Manual (NJ BMP Manual). Table V summarizes the infiltration data for each test location. Detailed field information is shown on Table IA - Double Ring Infiltrometer Test Results, included in the Appendix.
<table>
<thead>
<tr>
<th>Test Hole Number</th>
<th>(1) Infiltration Depth (feet)</th>
<th>Test Interval (minutes)</th>
<th>Final Drop in Water Level (inches)</th>
<th>Infiltration Rate (inches/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRI-1A</td>
<td>5.3</td>
<td>10</td>
<td>4.125</td>
<td>24.75</td>
</tr>
<tr>
<td>DRI-1B</td>
<td>5.3</td>
<td>10</td>
<td>3.750</td>
<td>22.50</td>
</tr>
<tr>
<td>DRI-2A</td>
<td>4.0</td>
<td>30</td>
<td>0.082</td>
<td>0.12</td>
</tr>
<tr>
<td>DRI-2B</td>
<td>4.0</td>
<td>30</td>
<td>0.062</td>
<td>0.12</td>
</tr>
<tr>
<td>DRI-2C</td>
<td>5.5</td>
<td>30</td>
<td>0.125</td>
<td>0.25</td>
</tr>
<tr>
<td>DRI-2D</td>
<td>5.5</td>
<td>30</td>
<td>0.062</td>
<td>0.12</td>
</tr>
<tr>
<td>DRI-3A</td>
<td>4.0</td>
<td>30</td>
<td>0.750</td>
<td>1.50</td>
</tr>
<tr>
<td>DRI-3B</td>
<td>4.0</td>
<td>30</td>
<td>1.375</td>
<td>2.75</td>
</tr>
<tr>
<td>DRI-3C</td>
<td>6.0</td>
<td>30</td>
<td>0.375</td>
<td>0.75</td>
</tr>
<tr>
<td>DRI-3D</td>
<td>6.0</td>
<td>30</td>
<td>0.125</td>
<td>1.25</td>
</tr>
</tbody>
</table>

(1) Indicates depth of infiltration test performed below existing site grade. Infiltration test depths were determined based on discussions with Federici & Akin P.A.

As shown in the above table, the infiltration rates range from 0.12 to 24.75 inches per hour. The infiltration rates shown above are field measured values and do not include a safety factor for design purposes. According to the referenced PA BMP Manual, a minimum factor of safety of 2.0 is recommended for most cases. The determination of the appropriate design value for the storm water management basins including application of the appropriate factors of safety is the responsibility of the project civil engineer. Based on the soil conditions and infiltration rates detailed above this site, stormwater infiltration generally appears to be feasible at tests DRI-1A and DRI-1B, and at tests DRI-3A and DRI-3B. The majority of infiltration rates obtained from the testing indicate the soils at these test depths are considered generally considered restrictive.

Once final stormwater management designs are determined, EEI recommends performing in-situ infiltration testing following excavations to achieve the designed basin bottom infiltration elevations. This testing will serve to confirm design infiltration rates of the soils at the basin bottom elevation and can be used to delineate areas that may require over-excavation of low or non-permeable soils. Soil amendment, using highly-permeable soils, will likely be required within
portions of the basin area to remove limiting material encountered at and/or below the basin bottom elevation during construction.

The scope of work for this project was limited to providing infiltration test results for the proposed storm water infiltration facilities, as discussed herein. This report offers no facts or opinions related to potential impacts resulting from infiltrating storm water at this location on structures and surrounding areas.

XV. CONSTRUCTION QUALITY CONTROL

The development of this site will involve significant earthwork and foundation construction activities, the quality of which directly impacts the validity of the recommendations presented in this report. Based upon past experience, the most effective and economical construction and earthwork inspection is obtained through the presence of a qualified representative of the Geotechnical Engineer of Record. Therefore, it is recommended that the site preparation, placement of the structural fill, and verification of the foundation subgrades be observed, tested, and documented in the field by EEI.

XVI. LIMITATIONS

The conclusions and recommendations contained in this report are based upon the subsurface data collected and on details stated in this report. Should conditions arise which differ from those specifically stated herein, or if design criteria are modified, our office should be notified immediately so that our recommendations can be reviewed and revised, if necessary.

Unless specifically indicated to the contrary in this report, the scope of this report is limited to only investigations and evaluations of the geotechnical aspects of the site conditions and does not include any considerations of potential site pollution, contamination or other environmental issues. This report offers no facts or opinions related to potential pollution or contamination on the site.
It is emphasized that this analysis was made for construction of the proposed new Workforce Development Center and Medicine Center buildings at the Rowan College at Gloucester County Campus in Deptford Township, Gloucester County, New Jersey. Earth Engineering Incorporated does not assume any responsibility in using this report to generate foundation design other than at the specific site addressed.

Respectfully submitted,
Earth Engineering Incorporated

Donato O. DiRocco, P.G.
Geotechnical Project Manager

Thomas B. Louis, P.E.
Director - New Jersey Division
New Jersey Professional Engineer
License Number GE 40918
APPENDIX

SITE LOCATION MAP
TESTING LOCATION PLAN
TEST BORING & TEST PIT PROFILES
BORING LOGS
SOIL DESCRIPTION LOGS
INfiltrATION TEST RESULTS LOGS
LABORATORY TEST RESULTS
Site Location Map

Rowan College @ Gloucester County
Workforce and Medicine Buildings
Deptford Township, Gloucester County, New Jersey

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists
PROPOSED STORMWATER MANAGEMENT BASIN AREAS

Lithology Graphics

- Topsoil
- FILL: Grayish Brown to Yellowish Brown Sandy Loam to Loam
- Stratum II: Yellow to Yellowish Red to Yellowish Brown to Brown Loamy Sand to Sandy Loam with Varying Amounts of Gravel

Initial Groundwater Level
Subsequent Groundwater Level
EOTP = End of Test Pit
I.T. = Infiltration Testing Depth

EARTH ENGINEERING INCORPORATED
Geotechnical Engineers & Geologists

TEST PIT PROFILES
PREPARED FOR
ROWAN COLLEGE @ GLOUCESTER COUNTY
DEPTFORD TOWNSHIP, GLOUCESTER COUNTY, NEW JERSEY

Project Number: 31381-J0  Date: 01/14/19  SHEET: 4
<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>SAMPLE NO.</th>
<th>TYPECORE RUN</th>
<th>BLOWN IN FT. ON SAMPLE</th>
<th>RECOVERY (Ft.)</th>
<th>RECOVERY (%)</th>
<th>USCS</th>
<th>AASHO</th>
<th>HO CONTENT</th>
<th>GRAPHIC LOG</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>WH1</td>
<td>S-1</td>
<td>1</td>
<td>1.5'</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>0.7</td>
<td>Topsoil (6.0&quot;)</td>
<td>-0.7</td>
</tr>
<tr>
<td>2.0</td>
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<td>S-2</td>
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<td>NA</td>
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<td>2.0</td>
<td>Fill - Brown Fine to Medium SAND, Some Silt</td>
<td>-2.0</td>
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<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>4.5</td>
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</tr>
<tr>
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<td>S-4</td>
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<td>NA</td>
<td>NA</td>
<td>NA</td>
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<td>Wet @ 19.0'</td>
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</tr>
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<td>End of Boring (EOB) @ 25.0'</td>
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** D = DRY, M = MOIST, W = WET
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<thead>
<tr>
<th>DEPTH (FT)</th>
<th>SAMPLE NO.</th>
<th>TYPE</th>
<th>CORE/PRE RUN</th>
<th>SLOWED FOR</th>
<th>RECOVERY (%)</th>
<th>MSDS</th>
<th>AASHTO</th>
<th>ROD (%)</th>
<th>USCS</th>
<th>GRAPHIC LOG</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
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<td>0.0</td>
<td>S-1</td>
<td>WOH</td>
<td>1</td>
<td>1</td>
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<td>-</td>
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<td>NA</td>
<td></td>
<td></td>
<td>Topsoil (0.0')</td>
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<td>WOH</td>
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<td>1.2'</td>
<td>-</td>
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<td>NA</td>
<td></td>
<td></td>
<td>Stratum I - Brown Fine to Medium SAND, Little Silt</td>
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<td>-</td>
<td>NA</td>
<td>NA</td>
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<td>Stratum I - Greenish Brown Silt, And to Some Sand, Trace Gravel</td>
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<td>-</td>
<td>NA</td>
<td>NA</td>
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<td></td>
<td>Stratum I - Pale Brown Fine to Coarse SAND, Little Silt</td>
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<td>S-5</td>
<td>WOH</td>
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<td>14</td>
<td>2.0'</td>
<td>-</td>
<td>NA</td>
<td>NA</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>14.0</td>
<td>S-5</td>
<td>WOH</td>
<td>10</td>
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<td>1.5'</td>
<td>-</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
<td>Stratum I - Brown Fine to Coarse SAND, Little Silt and Gravel</td>
<td>-18.0</td>
</tr>
<tr>
<td>19.0</td>
<td>S-7</td>
<td>WOH</td>
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<td>18</td>
<td>1.2'</td>
<td>-</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
<td>Wet @ 19.0'</td>
<td></td>
</tr>
<tr>
<td>22.0</td>
<td>S-8</td>
<td>WOH</td>
<td>5</td>
<td>5</td>
<td>1.2'</td>
<td>-</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
<td>Stratum I - Reddish Brown Fine to Medium SAND, Little Silt</td>
<td>-22.0</td>
</tr>
<tr>
<td>25.0</td>
<td>S-8</td>
<td>WOH</td>
<td>7</td>
<td>7</td>
<td>1.2'</td>
<td>-</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
<td>EOB @ 25.0'</td>
<td>Caved to 10.0', Wet @ 4 Hours</td>
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</table>

** D = DRY, M = MOIST, W = WET
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample No./Type of Run</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>0.0</td>
<td>S-1</td>
<td>Topsoil (8.0')</td>
</tr>
<tr>
<td>2.0</td>
<td>S-2</td>
<td>FILL - Brown Fine to Medium SAND, Some Silt</td>
</tr>
<tr>
<td>4.0</td>
<td>S-3</td>
<td>Stratum 1 - Brown Fine to Medium SAND, Some Silt</td>
</tr>
<tr>
<td>6.0</td>
<td>S-4</td>
<td>Stratum 1 - Brown to Reddish Brown Fine to Coarse SAND, Little Gravel, Trace Silt</td>
</tr>
<tr>
<td>8.0</td>
<td>S-5</td>
<td>Stratum 1 - Greenish Gray Silt, To And, To Some Sand, Trace Gravel and Silt</td>
</tr>
<tr>
<td>10.0</td>
<td>S-6</td>
<td>Stratum 1 - Dark Gray Fine to Medium SAND, Some Silt, Trace Gravel</td>
</tr>
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<td>14.0</td>
<td>S-7</td>
<td>Stratum 1 - Light Gray to Brown Fine to 25.0 Medium SAND, Trace Silt</td>
</tr>
<tr>
<td>16.0</td>
<td></td>
<td>EOB @ 25.0' Caved to 6.3', Wet</td>
</tr>
</tbody>
</table>

**D = DRY, M = MOIST, W = WET**
**PROJECT NAME**: Rowan College @ Gloucester County  
**PROJECT LOCATION**: Deptford Township, Gloucester County, New Jersey  
**PROJECT NUMBER**: 3131-19  
**INSPECTOR NAME**: A. Baer  
**EQUIPMENT USED**: Truck Mounted Drill Rig  
**DRILLER NAME/COMPANY**: K. Ryan/F.M.&W. Drilling Inc.  

**BORING NO.**: 9-4  
**DATE**: START: 1/10/19  
**END**: 1/10/19  
**SURFACE ELEV. (FT)**: 0.0

### BORE LOG

<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>SAMPLE RUN</th>
<th>TYPE OF RUN</th>
<th>LOG CYLINDER</th>
<th>BLownG (ft)</th>
<th>RECOVERY (%)</th>
<th>GRAVEL (%)</th>
<th>SAND (%)</th>
<th>Silt (%)</th>
<th>CLAY (%)</th>
<th>WATER</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
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<tbody>
<tr>
<td>0.0</td>
<td>1</td>
<td>1</td>
<td></td>
<td>1.2</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pill - Pale Brown Fine to Medium SAND, Some Silt</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
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<td>2</td>
<td></td>
<td>1.0</td>
<td>NA</td>
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<td></td>
<td>Stratum 1 - Orange Brown to Greenish Brown Fine to Medium SAND, Little Silt, Trace Gravel</td>
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</tr>
<tr>
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<td>3</td>
<td></td>
<td>1.5</td>
<td>NA</td>
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<td>Stratum 1 - Pale Brown Fine to Medium SAND, Trace Silt</td>
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<td>8.0</td>
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<td>4</td>
<td></td>
<td>1.2</td>
<td>NA</td>
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<td></td>
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<td></td>
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<td>Stratum 1 - Greenish Brown Fine to Medium SAND, Little Silt, Trace Clay</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
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<td>5</td>
<td></td>
<td>2.0</td>
<td>NA</td>
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<td></td>
<td></td>
<td>Stratum 1 - Light Gray Fine to Medium SAND, Trace Silt</td>
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</tr>
</tbody>
</table>
| 12.0       | 6          | 6           |               | 1.7         | NA           |            |          |          |          |        | EOB @ 25.0'  
Caved to 21.0', Dry |         |

---

**NOTES**:  
- **D** = DRY, **M** = MOIST, **W** = WET
### Boring Log

**Project Name:** Rowan College @ Gloucester County  
**Project Location:** Deptford Township, Gloucester County, New Jersey  
**Inspector Name:** A. Baer

**Equipment Used:** Truck Mounted Drill Rig  
**Drilling Methods:** Hollow Stem Augers/Split Spoon Sampling

#### Boring No.: B-5  
**Sheet:** 1 of 1  
**Date:** 1/9/19  
**Surface Elevation:** 0.0

<table>
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<tr>
<th>Depth (ft)</th>
<th>Sample No./Core Run</th>
<th>Blowing ft. on Sample (ft)</th>
<th>Recovery Ret (ft.)</th>
<th>Rod (ft.)</th>
<th>USC's</th>
<th>AASHTO</th>
<th>H.C. Content</th>
<th>Graphic Log</th>
<th>Description</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>0.0</td>
<td>S-1</td>
<td>1</td>
<td>0.0</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td>Topsoil (4.0')</td>
<td>Fill: Brown Fine to Medium SAND, Some Silt</td>
</tr>
<tr>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>S-2</td>
<td>2</td>
<td>1.2</td>
<td>-</td>
<td>NA</td>
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<td></td>
<td></td>
<td>Stratum 1 - Orange Brown Fine to Medium SAND, Little Silt, Trace Gravel</td>
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</tr>
<tr>
<td>6.0</td>
<td>S-3</td>
<td>6</td>
<td>1.4</td>
<td>-</td>
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<td></td>
<td></td>
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<td>Soil Mottling @ 5.1'</td>
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<td>8</td>
<td>2.0</td>
<td>-</td>
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<td></td>
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<td></td>
<td>Caved to 13.0', Wet @ 3.5' Hours</td>
</tr>
<tr>
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<td>S-5</td>
<td>8</td>
<td>2.0</td>
<td>-</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Wet @ 19.0'</td>
</tr>
<tr>
<td>16.0</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>19.0</td>
<td>S-7</td>
<td>4</td>
<td>2.0</td>
<td>-</td>
<td>NA</td>
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<td>Stratum 1 - Gray Fine to Medium SAND, Trace Silt</td>
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<td>22.0</td>
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</tr>
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<td>23.0</td>
<td>S-8</td>
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<td>1.5</td>
<td>-</td>
<td>NA</td>
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<td></td>
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<td>EOB @ 25.0'</td>
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**NOT ENCLOSED**

---

**D = DRY, M = MOIST, W = WET**
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample No. / Type</th>
<th>Recovery (%)</th>
<th>Siltosil %</th>
<th>USCS</th>
<th>AASHTO</th>
<th>Graphic Log</th>
<th>Description</th>
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<td>S-1 WOH</td>
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<td>WOH</td>
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<td>-</td>
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<td>Stratum I - Greenish Brown Fine to Medium SAND, Some Silt</td>
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<td>S-5 WOH</td>
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<td></td>
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<td>2.0'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td>EOB @ 25.0' - Caved to 21.5', Dry</td>
</tr>
</tbody>
</table>

**D = DRY, M = MOIST, W = WET**
**BORING NO. B-7**  
**SHEET 1 OF 1**  
**DATE: START 1/10/19**  
**END 1/10/19**  
**SURFACE ELEV. (FT) 0.0**

**PROJECT NAME:** Rowan College @ Gloucester County  
**PROJECT NUMBER:** 31583-J0  
**EQUIPMENT USED:** Truck Mounted Drill Rig  
**DRILLING METHODS:** Hollow Stem Auger/Split Spoon Sampling  
**AUGER SIZE:**  
**AUGER DEPTH:**  
**WATER DEPTH:**  
**START DATE:**  
**END DATE:**  
**DEPTH ENCOUNTERED:**  
**CHECKED BY:** D. DiRocco  
**DATE:**  
**DEPTH:**  
**TIME:**  
**DATE:**  
**NOT ENCOUNTERED**

<table>
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<tr>
<th>DEPTH (FT)</th>
<th>SAMPLE NO./</th>
<th>SAMPLER RUN</th>
<th>BLOWN (FT)</th>
<th>RECOVERY (%)</th>
<th>ROD (%)</th>
<th>USCS</th>
<th>H2O CONTENT</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
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<tr>
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<td>S-1</td>
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<td>WOH WOH WOH</td>
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</tr>
<tr>
<td>2.0</td>
<td>S-2</td>
<td>9 9 9</td>
<td>9 10</td>
<td>1.5</td>
<td>-</td>
<td>NA</td>
<td></td>
<td>Fill - Light Brown Fine to Medium SAND, Some Silt</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>S-3</td>
<td>18 18 18</td>
<td>15 18 19</td>
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<td>-</td>
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<td>Stratum I - Greenish Brown Fine to Medium SAND, Little Silt, Trace to Little Gravel, Trace Clay</td>
<td></td>
</tr>
<tr>
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<td>S-4</td>
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<td>18 18 18</td>
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<td>NA</td>
<td></td>
<td>Stratum I - Greenish Brown Fine to Medium SAND, Little Silt, Trace Clay</td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td>S-5</td>
<td>6 7 8</td>
<td>11 12 12</td>
<td>1.6</td>
<td>-</td>
<td>NA</td>
<td></td>
<td>Stratum I - Greenish Brown Fine to Medium SAND, Little Silt, Trace Clay</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.0</td>
<td>S-6</td>
<td>4 4 11</td>
<td>9 11 13</td>
<td>2.0</td>
<td>-</td>
<td>NA</td>
<td></td>
<td>Stratum I - Greenish Brown Fine to Medium SAND, Little Silt, Trace Clay</td>
<td></td>
</tr>
<tr>
<td>16.0</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.0</td>
<td>S-7</td>
<td>6 6 10 10</td>
<td>11 11 11</td>
<td>1.2</td>
<td>-</td>
<td>NA</td>
<td></td>
<td>Stratum I - Light Brown Fine to Medium SAND, Trace Silt</td>
<td></td>
</tr>
<tr>
<td>21.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23.0</td>
<td>S-8</td>
<td>3 6 7 8</td>
<td>6 7 8</td>
<td>1.8</td>
<td>-</td>
<td>NA</td>
<td></td>
<td>Stratum I - Light Brown Fine to Medium SAND, Trace Silt</td>
<td></td>
</tr>
<tr>
<td>25.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EOB @ 25.0'**  
Caved to 21.0', Dry

**D = DRY, M = MOIST, W = WET**
**PROJECT NAME**: Rowan College @ Gloucester County  
**PROJECT NUMBER**: 31381-J0  
**EQUIPMENT USED**: Truck Mounted Drill Rig  
**DRILLING METHODS**: Hollow Stem Augers/Split Spoon Sampling  
**PROJECT LOCATION**: Deptford Township, Gloucester County, New Jersey  
**INSPECTOR NAME**: A. Beer  
**DRILLER NAME/COMPANY**: K. Ryan/F.M.&W. Drilling Inc.  

<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>SAMPLE RUN</th>
<th>TYPE OF RUN</th>
<th>BLOWN/SQ.FT. ON SAMPLE</th>
<th>RECOVERY (%)</th>
<th>ROD (%)</th>
<th>USC G</th>
<th>AASHTO</th>
<th>GRAPHIC LOG</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>S-1</td>
<td>WOH</td>
<td>1.5'</td>
<td>-</td>
<td>NA</td>
<td>0.7</td>
<td></td>
<td>Topsoil (6.0&quot;)</td>
<td>-0.7</td>
<td></td>
</tr>
</tbody>
</table>
| 2.0        | S-2        | WOH         | 1.5'                   | -            | NA      | 2.5   |          | FILL - Brown Fine to Medium SAND,
|            |            |             |                        |              |         |       | Some Silt |             | -2.5      |         |
| 4.0        | S-3        | 12          | 2.0'                   | -            | NA      | 0.5   |          | Stratum I - Brown Fine to Medium SAND,
|            |            | 13          |                        |              |         |       | Little Silt, Trace Gravel | | -4.5      |         |
| 6.0        | S-4        | 13          | 1.5'                   | -            | NA      | 10.0  |          | Stratum I - Greenish Brown Fine to
|            |            | 14          |                        |              |         |       | Medium SAND, Little Silt, Trace Gravel
|            |            | 15          |                        |              |         |       | and Clay | | -10.0     |         |
| 10.0       | S-5        | 10          | 1.8'                   | -            | NA      |       |          | EOB @ 10.0'   | Caved to 3.5', Dry |         |

**D** = DRY, **M** = MOIST, **W** = WET
**BORING LOG**

**BORING NO.** B-9  
**DATE:** START 1/10/19  
**END:** 1/10/19  
**SURFACE ELEV. (FT):** 0.0

**PROJECT NAME:** Rowan College @ Gloucester County  
**PROJECT NUMBER:** 31381-J9  
**EQUIPMENT USED:** Truck Mounted Drill Rig  
**DRILLING METHODS:** Hollow Stem Auger/Split Spoon Sampling

**AUGER: SIZE:**  
**AUGER DEPTH:**  
**WATER: DEPTH:**  
**TIME:**  
**DATE:**

**CHECKED BY:** D. DiRocco  
**DATE:**  
**DEPTH:**  
**TIME:**  
**DATE:**

**LIGHTLY CHECKED:**

<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>SAMPLE NO.</th>
<th>TYPE/CORE RUN</th>
<th>SWELLING FT. ON SAMPLER</th>
<th>RECOVERY (%)</th>
<th>RECOVERY (%)</th>
<th>USCS</th>
<th>AASHTO</th>
<th>H2O CONTENT</th>
<th>GRAPHIC LOG</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>S-1</td>
<td>WOH WOH WOH</td>
<td>1.8'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Topsoil 6.0&quot;</td>
<td>-6.5</td>
</tr>
<tr>
<td>2.0</td>
<td>S-2</td>
<td>WOH WOH</td>
<td>1.5'</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td>Stratum I - Light Brown Fine to Medium SAND, Trace Silt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>S-3</td>
<td>WOH WOH WOH</td>
<td>2.0'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Stratum I - Greenish Brown Fine to Medium SAND, Little Silt, Trace Gravel</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>S-4</td>
<td>WOH WOH</td>
<td>1.7'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-7.8</td>
</tr>
<tr>
<td>10.0</td>
<td>S-5</td>
<td>WOH WOH</td>
<td>2.0'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td>EOB @ 10.0'</td>
<td>Caved to 0.5', Dry</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**D = DRY, M = MOIST, W = WET**
# Boring Log

**Project Name:** Rowan College @ Gloucester County  
**Project Number:** 31381.30  
**Project Location:** Deptford Township, Gloucester County, New Jersey

**Equipment Used:** Truck Mounted Drill Rig  
**Drilling Methods:** Hollow Stem Augers/Split Spoon Sampling  
**Inspector Name:** A. Baer  
**Driller Name/Company:** K. Ryan/F.M.W. Drilling Inc.

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample No.</th>
<th>Type of Core Run</th>
<th>Borehole 5 ft. on Sample</th>
<th>Recovery (%)</th>
<th>Recovery (ft)</th>
<th>ROD (%)</th>
<th>USCS</th>
<th>Asphalt</th>
<th>H₂O Content</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>WOH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.3 Topsoil (4.0&quot;)</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>S-1</td>
<td></td>
<td>1.0'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td>FILL - Brown Fine to Medium SAND, Some Silt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>S-2</td>
<td></td>
<td>1.5'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td>Stratum 1 - Light Brown Fine to Medium SAND, Trace Silt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>S-3</td>
<td></td>
<td>1.0'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td>Stratum 1 - Light Brown Fine to Medium SAND, Some Silt, Trace Gravel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td>S-4</td>
<td></td>
<td>1.5'</td>
<td>-</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td>EOB @ 10.0'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOT ENCOUNTERED**

**Remarks:**

**D = DRY, M = MOIST, W = WET**
<table>
<thead>
<tr>
<th>DEPTH (FT)</th>
<th>SAMPLE NO.</th>
<th>RECOVERY (FL)</th>
<th>H2O CONTENT</th>
<th>DESCRIPTION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>WOH</td>
<td>-</td>
<td>NA</td>
<td>Topsoil (6.0')</td>
<td>X</td>
</tr>
<tr>
<td>2.0</td>
<td>S-1</td>
<td>0.7</td>
<td>NA</td>
<td>FILL - Brown Fine to Medium SAND, Some Silt</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>S-2</td>
<td>1.5</td>
<td>NA</td>
<td>Stratum I - Light Brown Fine to Medium SAND, Little Silt, Trace</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>S-3</td>
<td>1.0</td>
<td>NA</td>
<td>Stratum I - Greenish Brown Fine to Medium SAND, Little Silt, Trace Gravel</td>
<td></td>
</tr>
<tr>
<td>8.0</td>
<td>S-4</td>
<td>1.2</td>
<td>NA</td>
<td>Stratum I - Light Gray Fine SAND, Trace Silt</td>
<td></td>
</tr>
<tr>
<td>10.0</td>
<td>S-5</td>
<td>1.8</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**D = DRY, M = MOIST, W = WET**
**Soil Description Log**

**Test Pit Location:** TP-1  
**Ground Cover / Land Use:** Grass  
**Initial Water Depth:** 8.3'  
**Subsequent Water Depth:** 7.5'  
**Additional Notes:** Infiltration Testing @ 5.3'  
**Probed Soils @ 4.0' - 5.0' Medium Dense  
**Limiting Zone:** Soil Mottling @ 7.3', Groundwater @ 8.3', Fine Grain Soils @ 0.6' - 2.5'

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Boundary</th>
<th>Matrix Color</th>
<th>Redox Mottles</th>
<th>Mottle Color</th>
<th>Texture</th>
<th>Structure</th>
<th>Consistence</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 - 0.6</td>
<td>Clear Smooth</td>
<td>10YR 3/3 Dark Brown</td>
<td>--</td>
<td>--</td>
<td>Sandy Loam</td>
<td>Subangular Blocky</td>
<td>Friable</td>
<td>Topsoil, Abundant Fine Roots</td>
</tr>
<tr>
<td>0.6 - 2.5</td>
<td>Clear Smooth</td>
<td>10YR 4/2 Dark Grayish Brown</td>
<td>--</td>
<td>--</td>
<td>Sandy Loam to Loam</td>
<td>Subangular Blocky</td>
<td>Firm</td>
<td>FILL</td>
</tr>
<tr>
<td>2.5 - 3.8</td>
<td>Gradual Wavy</td>
<td>10YR 5/4 Yellowish Brown</td>
<td>--</td>
<td>--</td>
<td>Loamy Sand</td>
<td>Subangular Blocky</td>
<td>Very Friable</td>
<td>5% Gravel</td>
</tr>
<tr>
<td>8.5 - 10.8</td>
<td>--</td>
<td>5YR 5/8 Yellowish Red</td>
<td>Common Coarse Distinct</td>
<td>10YR 6/6 Brownish Yellow</td>
<td>Gravelly Coarse Loamy Sand</td>
<td>Granular</td>
<td>Friable</td>
<td>20% Gravel, Soil Mottling @ 7.3', Wet @ 8.3'</td>
</tr>
</tbody>
</table>

**End of Test Pit (EOTP) @ 10.8' Due to Sidewall Collapse**

---

**EARTH ENGINEERING INCORPORATED**  
*Geotechnical Engineers & Geologists*  
403 Commerce Lane, West Berlin, NJ 08054  
PHONE 856-768-1001 FAX 856-778-1144

**Project Name:** Rowan College @ Gloucester County  
**Project Number:** 31381-J0  
**Date of Testing:** 12/20/2018  
**EEI Representative:** J. Kochenberger  
**Compiled by:** C. Lang  
**Date Compiled:** 12/21/2018  
**Sheet Number:** 1 of 1
# Soil Description Log

**Test Pit Location:** TP-2  
**Surface Elevation:** N/A  
**Equipment Used:** Komatsu PC200/Trackhoe  
**Excavating Company:** G Boys Excavating Inc.  
**Total Depth:** 10.6’  
**Ground Cover / Land Use:** Grass  
**Limiting Zone:** Soil Mottling @ 7.5’, Groundwater @ 8.2’, Fine Grain Soils @ 1.0’ - 2.1’  
**Initial Water Depth:** 8.2’  
**Time:** 0.25 hrs.  
**Date:** 12/20/2018  
**Subsequent Water Depth:** 7.6’  
**Time:** 4.00 hrs.  
**Date:** 12/20/2018  
**Additional Notes:** Infiltration Testing @ 4.0’ and 5.5’  
Probed Soils @ 4.0’ - 5.0’ Firm and Dense

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Boundary</th>
<th>Matrix Color</th>
<th>Redox Mottles</th>
<th>Mottle Color</th>
<th>Texture</th>
<th>Structure</th>
<th>Consistence</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clear</td>
<td>10YR 3/3</td>
<td>--</td>
<td>--</td>
<td>Sandy Loam</td>
<td>Subangular</td>
<td>Friable</td>
<td>Topsoil, Abundant Fine Roots</td>
</tr>
<tr>
<td>1</td>
<td>Smooth</td>
<td>Dark Brown</td>
<td>--</td>
<td>--</td>
<td>Loam</td>
<td>Subangular</td>
<td>Firm</td>
<td>FILL</td>
</tr>
</tbody>
</table>
| 2         | Clear    | 10YR 5/4     | --            | --           | Gravely Sandy to Loam | Subangular | Firm | 20% Gravel  
Secondary Color: 7.5YR 6/6 Reddish Yellow |
| 3         | Wavy     | 7.5YR 4/4    | --            | --           | Sandy Loam | Subangular | Firm     | Soil Mottling @ 7.5’, Wet @ 8.2’ |
| 4         |          | 2.5YR 6/4    | Common Coarse Prominent | 5YR 4/3 Reddish Brown | Sandy Loam | Subangular | Firm | EOTP @ 10.6’ |
| 5         |          |              |               |              |          |           |             |         |
| 6         |          |              |               |              |          |           |             |         |
| 7         |          |              |               |              |          |           |             |         |
| 8         |          |              |               |              |          |           |             |         |

---

**Project Name:** Rowan College @ Gloucester County  
**Project Number:** 31381.J0  
**Date of Testing:** 12/20/2018  
**EEI Representative:** J. Kochenberger  
**Compiled by:** G. Lang  
**Date Compiled:** 12/21/2018  
**Sheet Number:** 1 of 1
## Soil Description Log

**Test Pit Location:** TP-3  
**Surface Elevation:** N/A  
**Equipment Used:** Komatsu PC200/Trackhoe  
**Excavating Company:** G Boys Excavating Inc.  
**Total Depth:** 14.0'

**Ground Cover / Land Use:** Grass

**Limiting Zone:** Soil Mottling @ 10.5', Groundwater @ 11.8', Fine Grain Soils @ 0.9' - 1.8'

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Boundary</th>
<th>Matrix Color</th>
<th>Redox Mottles</th>
<th>Mottle Color</th>
<th>Texture</th>
<th>Structure</th>
<th>Consistency</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0 - 0.9 Clear Smooth</td>
<td>7.5YR 5/4 Brown</td>
<td>--</td>
<td>--</td>
<td>Sandy Loam</td>
<td>Subangular Blocky</td>
<td>Friable</td>
<td>Topsoil, Abundant Fine Roots</td>
</tr>
<tr>
<td>2</td>
<td>0.9 - 1.8 Clear Smooth</td>
<td>10YR 5/6 Yellowish Brown</td>
<td>--</td>
<td>--</td>
<td>Sandy Loam to Loam</td>
<td>Subangular Blocky</td>
<td>Friable</td>
<td>Trace Fine Roots</td>
</tr>
<tr>
<td>3</td>
<td>1.8 - 6.5 Clear Wavy</td>
<td>7.5YR 6/8 reddish yellow</td>
<td>--</td>
<td>--</td>
<td>Gravelly Sandy Loam</td>
<td>Subangular Blocky</td>
<td>Firm</td>
<td>15% Gravel</td>
</tr>
<tr>
<td>4</td>
<td>6.5 - 14.0 --</td>
<td>2.5YR 6/8 Olive Yellow</td>
<td>Common Coarse Prominent</td>
<td>2.5YR 3/4 reddish brown</td>
<td>Coarse Sandy Loam</td>
<td>Granular</td>
<td>Very Friable</td>
<td>5%-10% Gravel, Soil Mottling @ 10.5', Wet @ 11.8'</td>
</tr>
</tbody>
</table>

**Initial Water Depth:** 11.8'  
**Time:** 0.25 hrs.  
**Date:** 12/20/2018  
**Subsequent Water Depth:** 11.1'  
**Time:** 4.00 hrs.  
**Date:** 12/20/2018  
**Additional Notes:** Infiltration Testing @ 4.0' and 6.0'  
**Probed Soils @ 4.0' - 5.0' Firm and Dense**

---

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**Geotechnical Engineers & Geologists**  
403 Commerce Lane, West Berlin, NJ 08054  
PHONE 856-768-1001  FAX 856-778-1144  

**Project Name:** Rowan College @ Gloucester County  
**Project Number:** 31381.J0  
**Date of Testing:** 12/20/2018  
**EEI Representative:** J. Kochenberger  
**Compiled by:** C.Lang  
**Date Compiled:** 12/21/2018  
**Sheet Number:** 1 of 1
## TABLE 1A - Double Ring Infiltrometer Test Results Log

<table>
<thead>
<tr>
<th>Test Hole Number</th>
<th>Surface Elevation (ft.)</th>
<th>*Infiltration Depth (ft.)</th>
<th>Drop in Water during Presoak Period (in.)</th>
<th>10 Min.</th>
<th>20 Min.</th>
<th>30 Min.</th>
<th>40 Min.</th>
<th>Infiltration Rate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DRI-1A</td>
<td>N/A</td>
<td>5.3</td>
<td></td>
<td>4.125</td>
<td>4.125</td>
<td>4.125</td>
<td>4.125</td>
<td>24.75</td>
<td></td>
</tr>
<tr>
<td>DRI-1B</td>
<td>N/A</td>
<td>5.3</td>
<td></td>
<td>3.750</td>
<td>3.750</td>
<td>3.750</td>
<td>3.750</td>
<td>22.50</td>
<td></td>
</tr>
</tbody>
</table>

* Infiltration depths were measured from existing site grades at the time of the investigation.

** Infiltration test depth field adjusted based on depth to limiting zone.

<table>
<thead>
<tr>
<th>Test Hole Number</th>
<th>Surface Elevation (ft.)</th>
<th>*Infiltration Depth (ft.)</th>
<th>Drop in Water during Presoak Period (in.)</th>
<th>30 Min.</th>
<th>60 Min.</th>
<th>90 Min.</th>
<th>120 Min.</th>
<th>150 Min.</th>
<th>Infiltration Rate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DRI-2A</td>
<td>N/A</td>
<td>4.0</td>
<td></td>
<td>0.125</td>
<td>0.125</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.12</td>
</tr>
<tr>
<td>DRI-2B</td>
<td>N/A</td>
<td>4.0</td>
<td></td>
<td>0.125</td>
<td>0.125</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.12</td>
</tr>
<tr>
<td>DRI-2C</td>
<td>N/A</td>
<td>5.5</td>
<td></td>
<td>0.125</td>
<td>0.125</td>
<td>0.125</td>
<td>0.125</td>
<td>0.125</td>
<td>0.125</td>
<td>0.25</td>
</tr>
<tr>
<td>DRI-2D</td>
<td>N/A</td>
<td>5.5</td>
<td></td>
<td>0.125</td>
<td>0.125</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.062</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Indicates the final reading that was used to determine the infiltration rate at the corresponding location.

---

**EARTH ENGINEERING INCORPORATED**  
Geotechnical Engineers & Geologists

403 Commerce Lane  
West Berlin, NJ 08091
PHONE 856-768-1001  
FAX 856-768-1144

**INфиLTRATION TESTING LOG**

Project Name: Rowan College @ Gloucester County  
Project Number: 31381J0  
Date of Testing: 12/20/18  
EEI Representative: J. Kochenberger  
Drawn/Compiled by: C. Lang  
Date Compiled: 12/21/18
## TABLE 1A - Double Ring Infiltrometer Test Results Log

<table>
<thead>
<tr>
<th>Test Hole Number</th>
<th>Surface Elevation (ft.)</th>
<th>*Infiltration Depth (ft.)</th>
<th>Drop in Water during Presoak Period (in.)</th>
<th>Drop in Water at Time (in.)</th>
<th>Infiltration Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 min.</td>
<td>60 min.</td>
<td>30 Min.</td>
</tr>
<tr>
<td>DRI-3A</td>
<td>N/A</td>
<td>4.0</td>
<td>1.500</td>
<td>1.375</td>
<td>0.750</td>
</tr>
<tr>
<td>DRI-3B</td>
<td>N/A</td>
<td>4.0</td>
<td>1.875</td>
<td>1.625</td>
<td>1.375</td>
</tr>
<tr>
<td>DRI-3C</td>
<td>N/A</td>
<td>6.0</td>
<td>1.000</td>
<td>0.625</td>
<td>0.375</td>
</tr>
<tr>
<td>DRI-3D</td>
<td>N/A</td>
<td>6.0</td>
<td>1.250</td>
<td>1.000</td>
<td>0.625</td>
</tr>
</tbody>
</table>

* Infiltration depths were measured from existing site grades at the time of the investigation.
** Infiltration test depth field adjusted based on depth to limiting zone.

---

Indicates the final reading that was used to determine the infiltration rate at the corresponding location.

---

**EARTH ENGINEERING INCORPORATED**

*Geotechnical Engineers & Geologists*

403 Commerce Lane West Berlin, NJ 08091
PHONE 856-768-1001 FAX 856-768-1144

---

**INфиLTRATION TESTING LOG**

Project Name: Rowan College @ Gloucester County
Project Number: 31381-J0
Date of Testing: 12/20/18
EEI Representative: J. Kochenberger
Drawn/Compiled by: C. Lang
Date Compiled: 12/21/18
Particle Size Analysis of Soils

Percent Passing Sieve

Sieve Opening, mm

<table>
<thead>
<tr>
<th>% Gravel</th>
<th>7.2</th>
<th>Coarse: 4.2</th>
<th>Fine: 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Sand</td>
<td>70.3</td>
<td>Coarse: 3.0</td>
<td>Medium: 28.0</td>
</tr>
</tbody>
</table>

Gravel Description: Light Brown, subrounded

Sand Description: Light Brown, subrounded

Consistency: Firm
Hardness: NR
Cementation: NR
Dry Strength: NR
Structure: Homogeneous
Dilatancy: NR
Reaction to HCl: NR

USCS Classification: SM, silty sand
AASHTO Classification: A-2-4

Project: 31381.00 - Rowan College at Gloucester County
Client: Greyhawk
Sample: B-1, S-2 (1-3-3-5); B-2, S-2 (1-2-4-5); B-5, S-2 (2-4-5-9)
Depth: 2.0'-4.0', 2.2'-3.9', 3.0'-4.0'

Description: Brown Fine to Medium Sand, Little Silt, Trace Gravel

Remarks:

Classification of Soils, ASTM D 2487-11 / D 2488-09a

January 15, 2019
### Particle Size Analysis of Soils

<table>
<thead>
<tr>
<th>Sieve Opening, mm</th>
<th>Percent Passing Sieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot;</td>
<td>100</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>90</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>80</td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>75</td>
</tr>
<tr>
<td>No4</td>
<td>60</td>
</tr>
<tr>
<td>No10</td>
<td>50</td>
</tr>
<tr>
<td>No40</td>
<td>40</td>
</tr>
<tr>
<td>No100</td>
<td>30</td>
</tr>
<tr>
<td>No200</td>
<td>25</td>
</tr>
<tr>
<td>0.1</td>
<td>20</td>
</tr>
<tr>
<td>0.01</td>
<td>10</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### As-received water content: 24.5% moist  Odor: none

<table>
<thead>
<tr>
<th>% Gravel</th>
<th>% Coarse</th>
<th>% Fine</th>
<th>US Standard Sieve Size</th>
<th>Diameter, % Finer</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.8</td>
<td>6.0</td>
<td>9.6</td>
<td>3&quot;</td>
<td>75</td>
</tr>
<tr>
<td>45.3</td>
<td>3.2</td>
<td>18.3</td>
<td>1 1/4&quot;</td>
<td>38.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/2&quot;</td>
<td>19.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/4&quot;</td>
<td>100.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No4</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No10</td>
<td>4.75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No40</td>
<td>94.2</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>No100</td>
<td>91.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No200</td>
<td>72.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>48.9</td>
</tr>
</tbody>
</table>

#### Consistency: firm  Hardness: NR

#### Cementsation: NR  Dry Strength: NR

#### Structure: homogeneous  Dilatancy: NR

#### Reaction to HCl: NR  Toughness: NR

#### USCS Classification: SM, silty sand

#### AASHTO Classification: A-7-5

### Particle Size

#### GRAVEL

<table>
<thead>
<tr>
<th>Size</th>
<th>Diameter, % Finer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse</td>
<td>3&quot; 75</td>
</tr>
<tr>
<td>Coarse</td>
<td>1 1/4&quot; 38.1</td>
</tr>
<tr>
<td>Coarse</td>
<td>1/2&quot; 19.0</td>
</tr>
<tr>
<td>Coarse</td>
<td>1/4&quot; 100.0</td>
</tr>
<tr>
<td>Fine</td>
<td>9.5</td>
</tr>
<tr>
<td>Fine</td>
<td>4.75</td>
</tr>
</tbody>
</table>

#### SAND

<table>
<thead>
<tr>
<th>Size</th>
<th>Diameter, % Finer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse</td>
<td>No4 94.2</td>
</tr>
<tr>
<td>Medium</td>
<td>No10 91.0</td>
</tr>
<tr>
<td>Medium</td>
<td>No40 72.7</td>
</tr>
<tr>
<td>Medium</td>
<td>No100 55.2</td>
</tr>
<tr>
<td>Fine</td>
<td>No200 48.9</td>
</tr>
</tbody>
</table>

#### Hydrometer Analysis

<table>
<thead>
<tr>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay Size</td>
<td>0.005</td>
</tr>
<tr>
<td>Colloids</td>
<td>0.001</td>
</tr>
</tbody>
</table>

#### Other Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gs</td>
<td>NR</td>
</tr>
<tr>
<td>Cc</td>
<td>N/A</td>
</tr>
<tr>
<td>Cc</td>
<td>N/A</td>
</tr>
<tr>
<td>LL</td>
<td>56</td>
</tr>
<tr>
<td>PL</td>
<td>30</td>
</tr>
<tr>
<td>PPL</td>
<td>20</td>
</tr>
</tbody>
</table>

#### Project: 31381.J0 - Rowan College at Gloucester County

**Client:** Greyhawk

**Sample:** B-1, S-6 (3-3-4-6); B-3, S-5 (15-9-2-3); B-6, S-4 (9-13-14-15)

**Depth:** 14.0'-16.0', 9.5'-10.0', 6.0'-8.0'

**Description:** Greenish Brown Fine to Medium Sand, Some Silt and Clay, Trace Gravel

---

**Remarks:**

**Classification of Soils, ASTM D 2487-11 / D 2488-09a**

January 16, 2019
SECTION 200 SITE WORK GENERAL REQUIREMENTS

200.1 SCOPE OF WORK

The intent of the Contract is for the Contractor to construct the Work to be functionally complete and aesthetically acceptable. Perform work that may be reasonably inferred from the Contract as being required to produce the intended result under the Items of the Contract. Perform the Work using the best construction practices and provide materials and workmanship of the first quality to meet the Contract requirements.

The site work for this project includes but is not limited to the complete construction of water mains, sanitary sewer mains, storm sewer system, site grading, asphalt parking lots and driveways, concrete sidewalks, site lighting, landscaping, site security and erosion controls, and building utility services as shown on the site plans and details and as described in these specifications.

Should any discrepancies arise between Deptford Township Municipal Utilities Authority (DTMUA) Rules and Regulation and the Specifications herein, the DTMUA Rules and Regulations shall govern.

Nothing in the site plans or details shall be understood to supersede any current code requirements. All utilities services shall comply with the applicable National Codes and the applicable New Jersey Building Code and Subcodes.

All work shall be coordinated with the architectural, electrical, mechanical and other plans issued with the contract documents. Discrepancies or conflicts between any plans or directions and the site plans shall be brought to the attention of the construction manager prior to performing work in either the building or site areas.

In all cases, walks leading to building egress or entrance points as well as road and driveway crossings shall be in compliance with the 2000 ADA guidelines. Where necessary the contractor shall adjust the layout, with approval of the construction manager, to ensure that ADA compliance is achieved.

All quantities indicated on the Civil Drawings are approximate estimates intended to convey a general size of the work and the various significant site work items that the project requires. The contractor shall extend the various site work items as needed to construct a smooth, aesthetically pleasing and functional joint and transition from existing to new construction.

The contractor agrees, without exception, that the quantities shown in the drawings are approximate estimates and not guaranteed, that he has measured and calculated on his own what is needed for the completed project, that the project is a Lump Sum Bid and that he has prepared and submitted his bid accordingly and understands that no additional compensation above his bid shall be requested or provided for the Work should he be awarded the Contract.

The exact saw cut location, and location at which new curbs and sidewalks will be joined with existing curbs and sidewalks will be determined in the field in consultation with the Construction Manager. Adjustments shall be made to include replacements of curbs and pavement that may be found to be damaged adjacent to the general location shown on the plans. Curbs and sidewalks shall be removed to existing joint locations. Remainders less than 8 ft for curbs or 4 feet for walks shall not be acceptable.

Comply with all relevant sections of the 2007 Standard Specifications, regarding site work, earthwork, backfill materials, concrete, storm drains, sidewalks, utilities, landscaping, signage, striping, traffic control, etc.

Construction of the proposed Basins J & K will include all excavation, restoration, sand bottom, headwalls, outlet structure, discharge pipe and erosion controls associated with these structures.
ROWAN COLLEGE AT GLOUCESTER COUNTY
MEDICINE AND ECONOMIC DEVELOPMENT CENTERS

200.2 WORKING DRAWINGS

When working drawings are specified, submit methods of construction, material designations, design calculations, catalogue cuts, illustrations, schedules, performance charts, brochures, and other information necessary to construct the work as specified in the Contract. Do not submit working drawings that are repetitious or duplicative of Items specified or detailed within the Contract or that change the Plans or Specifications.

Ensure that working drawing submissions also conform to the Department design manuals and other Department standards for the proposed work. Ensure that working drawings are signed and sealed by a Professional Engineer. After Award, the Department will provide additional formatting information, the number of copies required, and the designated design unit to which the Contractor shall submit working drawings.

Review, sign, and submit working drawings in an orderly sequence so as not to delay the Work, or the work performed by Others. By submitting working drawings for review and approval, the Contractor certifies that it has verified all field measurements and that all dimensions shown conform to the Contract. The Contractor further certifies that catalog numbers, field construction criteria, materials, and other criteria have been coordinated with the requirements of the Contract and the Work for each submitted working drawing. The certification or approval of working drawings does not constitute an approval of any materials noted.

The Department's certification or approval of working drawings signifies only that the drawings are in general conformance with the Contract. The Department's certification or approval of working drawings does not relieve the Contractor from responsibility for errors and omissions in the working drawings and their correction.

Submit working drawings for certification or approval as called for on the drawings and in these specifications.

200.3 COORDINATION WITH UTILITIES

The Contractor is responsible for coordinating work performed by Utilities, and is responsible for delays and costs resulting from failure to coordinate. Provide a written request to each Utility in the time specified for the advance notice requirements specified in the Special Provisions. Include the following:

1. Name and location of the Project.

2. Name and contact information of the Contractor and superintendent.

3. Portion of the approved preliminary schedule or baseline schedule that affects the Utility.

Provide a copy of the notice and response to the RE.

Where Utilities jointly use poles or duct banks, the Utilities will perform the work sequentially.

Ensure that the work site is in a condition that allows the Utility to perform its work at the scheduled time. If the Contractor fails to provide the work site at the scheduled time, the Contractor is responsible for the resulting delays and costs to the Project. If the Contractor causes the Utility to incur additional costs, or delays the Utility without prior written approval of the RE, the Contractor is responsible for these costs and delays. The Department has the right to recover the cost of damages from the Contractor.

Immediately notify the RE of failure by the Utility to respond or complete its work as specified in the Special Provisions.
200.4 MATERIALS CERTIFICATIONS

The Department will accept materials, as specified, on the basis of Certificates of Compliance stating that the materials or assemblies fully comply with the requirements of the Contract.

The Department has the right to sample and test materials or assemblies accepted on the basis of Certificates of Compliance at any time. The Department will reject materials or assemblies, whether in place or not, if found not to be in conformance with the Contract requirements.

Ensure that 4 copies of the manufacturer’s Certificates of Compliance are provided with each delivery of materials, components, and manufactured items that are accepted by certification. Retain 1 copy and submit 3 copies to the RE. With the Certificate of Compliance, provide a transmittal identifying the Item for which it is submitted. Ensure that Certificates of Compliance contain the following information:

1. Project Name.
2. Name of the Prime Contractor.
4. Quantity of material represented by the certificate.
5. Means of identifying the consignment, such as label marking and seal number.
6. Date and method of shipment.
7. A statement that the material conforms to the Contract material requirements and that representative samples have been sampled and tested.
8. If the submission is for an assembly of materials, a statement that the assembly conforms to the Contract.
9. Signature of a person having legal authority to bind the supplier.
10. Signature attested to by a notary public or other properly authorized person.

The Department will not make payment for work for which material is accepted on the basis of a Certificate of Compliance until the RE has received the required Certificate of Compliance and inspected and accepted the material or assembly.

200.5 PROHIBITED ACTIVITIES

Prohibited construction procedures for all parts of the work include, but are not limited to the following:

1. Dumping of spoil material into any stream corridor, any wetlands, any surface waters, or at unspecified locations.

2. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, any wetlands, or any surface waters.

3. Pumping of silt-laden water from trenches or other excavations into any surface waters, any stream corridors, or any wetlands.

4. Damaging vegetation adjacent to or outside of the access road or right-of-way,

5. Disposal of trees, brush, and other debris in any stream corridors, any wetlands, any surface waters, or at unspecified locations.

200-3

4/1/2019    Section 200
ROWAN COLLEGE AT GLOUCESTER COUNTY
MEDICINE AND ECONOMIC DEVELOPMENT CENTERS

6. Open burning of debris

7. Applying any pesticides, including defoliants, desiccants, and plant regulators, in any wetlands containing significant stands of high vigor Spartina Alterniflora (Saltmarsh Cordgrass), Zizania Aquatica (Wildrice), Typha SP (Cattail), and Scirpus Americanus (Common Threesquare).

8. Applying pesticides whose residues and metabolic products persist in the environment over extended periods of time.

9. Any work that allows silica sand or other dust particles to be airborne or to otherwise be tracked or moved off of the site into areas of pedestrian or other college activities.

200.6 PROTECTION OF EXISTING PROPERTY

PART I: GENERAL

1.01 WORK INCLUDED

Requirements for protecting existing public and private property at or in vicinity of the Work Site.

CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to all public and private property not designated for removal, relocation or replacement in the course of construction.

CONTRACTOR shall protect the natural vegetation and other existing landscape features and surroundings. Damages to tree trunks, limbs, bark and roots shall be repaired using acceptable tree surgeon methods.

All grass areas beyond the construction limits damaged by the CONTRACTOR shall be repaired using seeding methods and materials equal to or better than that existing prior to construction.

Where damage or injury or loss is done to public or private property as a result of the CONTRACTOR's execution of the work, such property shall be restored by the CONTRACTOR at his expense to a condition equal to that existing prior to the damage.

Survey markers removed or disturbed by the CONTRACTOR's operations shall be reset by a licensed professional land surveyor registered in the State of New Jersey.

1.04 SUBMITTALS

CONTRACTOR will submit to the ENGINEER lists of damages to property that exist prior to construction or construction related activity. The lists shall include the following information:

1. Location of damage by station or address
2. Nature of damage
3. Extent of damage
4. Still photograph of the damage showing surrounding area for reference.
5. Still photograph of the damage showing close up dimensions and/or details.
200.7 TRAFFIC CONTROLS

PART 1: GENERAL

1.01 SCOPE OF WORK

ALL CONSTRUCTION TRAFFIC MUST ENTER AND EXIT THE COLLEGE SITE VIA THE EXISTING TANYARD ROAD ACCESS.

ALL CONSTRUCTION DELIVERIES MUST BE MADE BEFORE 7:30 AM OR AFTER 3:00 PM MONDAY THRU THURSDAY OR ANYTIME ON FRIDAYS.

The contractor shall construct temporary latex stripes within the designated parking area and shall erect approved directional signs to alert construction drivers and the student body where the construction vehicles are to go within the lot. All contractor personnel and work vehicles shall park only within designated areas.

The contractor shall also erect temporary fencing barricades or other measures as and whenever needed around loading/unloading areas while such work is actively being performed. Sidewalks along the front of the laydown areas shall remain open except during brief periods of loading and unloading.

The contractor shall obtain approval from the Construction Manager for each and every closure of the sidewalk and any part of a parking lot at least 48 hours prior to erecting the closure devices.

If closures of the walk or parking areas are approved and may extend into busy pedestrian periods, the contractor shall construct a bypass pedestrian corridor of barricades or temporary construction fencing, which shall keep vehicles and pedestrians safely separated and shall connect the existing walk from one side of the work to the other.

This work includes the maintenance and protection of both vehicular and pedestrian traffic within and adjacent to the area of the Project so that both can safely and conveniently traverse around the work area from one area of the campus to another.

CONTRACTOR shall furnish and install all traffic barricades, markers, and signs, provide flagmen, and other facilities required by the Federal, State and local government authorities and the ENGINEER to protect general public and maintain the existing roads, streets and highways. Any work performed as part of this contract that will interfere with the efficient flow of traffic must have certified flagmen on site.

The CONTRACTOR shall notify the College and request approval for any desired limitations to the existing traffic patterns.

The OWNER or ENGINEER make no warranty or representation that the CONTRACTOR will be permitted to divert or barricade traffic and the CONTRACTOR shall be fully responsible to complete all obligations of the Contract regardless of any restrictions which may be imposed by Federal, State or local authorities.

1.02 MAINTAINING TRAFFIC

A. Traffic Diversion

Traffic diversion is not permitted for this project.

B. One-Way Traffic

Whenever one-way traffic is established, at least two (2) flagmen shall be provided.
C. Pedestrian Traffic

Pedestrian access to all of the College walkways and parking lots must be maintained at all times.

1.03 TRAFFIC SIGNS

The installation and operation of traffic control signage shall conform to the requirements of Federal, State, and local government highway departments.

Signs not in use must be bagged, removed or positioned in such a manner so as not to be seen by motorists.

All signs that are no longer actively in use should be removed or covered with burlap immediately.

PART 2: PRODUCTS

Maintenance and protection of traffic for this Project shall conform to the most current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways and its latest editions and addenda, hereinafter referred to as the MUTCD, N.J.D.O.T. Standard Specifications, 2007 Amended, and all other warning signs and maintenance of barricades, traffic cones and drums shall be in strict conformance with N.J.D.O.T. Standard Specifications.

PART 3: EXECUTION

Within 10 days after notice to the Contractor of the award of the Contract, he shall submit, in writing for the approval of the Engineer a plan of the methods, traffic corridors, facilities and devices he proposes for use for the maintenance and protection of traffic.

Signs, barricades, traffic cones, shall be established, relocated, repaired and replaced in such manner and at such times and places as may be necessary for adequate protection of vehicular and pedestrian traffic, subject to the approval of the Engineer. The Contractor shall provide sufficient flagmen and shall take all other precautions including any which may be order by the Engineer, that are necessary for the safety of the public and protection of traffic and work. Patrols shall be made on a regular basis to assure that all maintenance devices and warning signs are in a working condition and have a clean appearance.

ADA compliant access must be maintained at all times along the existing and temporary pedestrian paths. The Contractor not be permitted to completely shutdown a pedestrian path at any time. The Contractor shall stage his or her construction operations in order to allow for constant ADA compliant access to all of the College paths. The plan for maintaining pedestrian traffic must be approved by the Owner and the College Security Department.

The means provided for the maintenance of traffic shall be removed upon completion of each portion of the project and all damage done to the adjacent property shall be repaid by the Contractor at his own expense.

200.8 MATERIAL AND EQUIPMENT

PART 1: GENERAL

1.01 PROTECTION OF MATERIAL AND EQUIPMENT

The CONTRACTOR shall be responsible for the safe storage of all material furnished to or by him until it has been incorporated in the completed project and accepted by the ENGINEER. The CONTRACTOR shall bear the risk of loss and/or damage to the materials and Work until the Work is finally accepted by the ENGINEER.
All electrical and mechanical equipment shall be stored in a warm, dry shelter with proper ventilation. Under no circumstances shall motors, electrical control equipment or any other electrical or mechanical equipment be stored under polyethylene plastic covers or tarpaulins. When space is available inside existing structures, and the OWNER approves, the CONTRACTOR will be allowed to store equipment inside them. Should such space not be available, the CONTRACTOR shall construct a shelter with a source of heat and proper ventilation as approved by the ENGINEER for the storage of equipment.

PART 2: PRODUCTS

Unless otherwise specifically provided for in these specifications, all equipment, materials and articles incorporated in the Work shall be new, in current production and the best grade obtainable consistent with general construction usage.

Materials specified by reference to the number or symbol of a specific standard, such as a Commercial Standard, Federal Specification or other similar standard, shall comply with the supplement in effect on the date of the Specifications, except as limited to type, class or grade, or modified by these Specifications.

The CONTRACTOR shall submit to ENGINEER samples of materials for approval when requested and/or directed.

PART 3: EXECUTION

The CONTRACTOR shall verify and make necessary corrections to construction dimensions for all specified materials to be installed and function within the intent of the Contract Drawings and Specifications. The CONTRACTOR will promptly notify the ENGINEER of all necessary corrections required.

All material, equipment, fixtures and devices furnished shall comply with the requirements and standards of all Federal, State and local laws, ordinances, and codes governing safety and health.

When received from the Carrier and at time of unloading, the CONTRACTOR shall inspect all materials and accessories for loss or damage. The CONTRACTOR shall accept no shipment of material unless the Carrier’s agent has described loss or damage on the Bill of Lading. Any discrepancies between the Bill of Lading and the physical material shall be noted on the Bill of Lading. All demurrage charges on carloads or truckloads of pipe or other material shall be paid by the CONTRACTOR.

The CONTRACTOR shall be responsible for all material furnished by him. The CONTRACTOR at his expense shall replace all such material that is defective in manufacture or has been damaged in transit or after delivery.

The CONTRACTOR's responsibility for material furnished by the OWNER shall begin upon CONTRACTOR's acceptance at the point of delivery to him. All such material shall be examined, and material defective in manufacture and/or otherwise damaged shall be rejected by the CONTRACTOR at the time and place of delivery to him and replaced by the OWNER. Once Accepted by the CONTRACTOR, at the point of delivery to him, all defective and/or damaged material discovered prior to final acceptance of the Work shall be removed by the CONTRACTOR and he shall install, at his own expense, the material replaced. In such case the CONTRACTOR shall furnish all labor, equipment and material incidental to replacement and necessary for the completion of the Work to the satisfaction of the ENGINEER. The CONTRACTOR will be reimbursed for the cost of replacing defective materials furnished by the OWNER and accepted by the CONTRACTOR if, but only if, the CONTRACTOR submits proof satisfactory to the ENGINEER and to the manufacturer and/or supplier from whom the OWNER purchased the material that the defect was latent and could not have been discovered by the CONTRACTOR.

The CONTRACTOR shall be responsible for unloading, stringing and/or storing all materials delivered to the job.
site. In addition, the CONTRACTOR shall inspect the delivered materials as specified in Section 200.06.3.03.

The CONTRACTOR may utilize a fenced in area for storage of materials or opt to install a temporary protected staging area elsewhere.

200.9 TESTING

PART I: GENERAL

The construction manager shall be responsible for testing all materials constructed on site. A geotechnical testing lab and or Geotechnical engineer will be retained to perform soils testing and asphalt testing upon request of the Construction manager.

The contractor shall schedule and coordinate all work in advance with the Construction manager to facilitate the on-site testing and re-testing where needed. Coordination shall include but not be limited to providing safe & timely access to the work area, control reference points, survey and access equipment, and appropriate safe locations on site for storage of samples.

Concrete samples shall be taken and prepared for testing. Concrete samples shall be stored on site in a manner identical to the conditions of the concrete that the samples represent.

Manufactured items, e.g. pipe, conduit, precast concrete, castings, lights, irrigation components etc, shall be tested by the manufacturer and shall be certified to comply with these specifications, applicable standards and the submitted shop or working drawings and materials submittals.

The owner reserves the right to test any manufactured materials for conformance at its expense either before, during or after incorporation in the work. Costs for all testing shall be back charged to the Contractor for any materials found to be not conforming.

1.02 PIPELINES

All pipelines, valves, appurtenances, etc. installed per these Contract Documents shall be tested in the manner described by the technical specifications and as required by the Utility Authority. Unless otherwise stated, all pipelines shall be hydrostatically tested, with no leakage, at a pressure at least equal to the maximum operating pressure of the pipeline.

1.03 PERFORMANCE TESTS

A. General

1. The CONTRACTOR shall assist the Construction Manager and Utilities Representatives in the performance of all tests as may be required by the Specifications, the Authority having jurisdiction, or necessary for activation of the system. All operations and coordination of the tests from the beginning to their satisfactory completion as determined by the OWNER and ENGINEER shall be the complete responsibility of the CONTRACTOR.

2. The general sequencing of the testing shall be included in the Contractors Schedule. The CONTRACTOR shall give the OWNER at least 14 days written notice prior to the commencement of mechanical performance tests and start-up.

PART 2: PRODUCTS

All testing devices and equipment shall be new, and shall be calibrated as per manufacturer’s requirements. Records of calibration shall be provided to the Construction Manager prior to testing and upon request.
ROWAN COLLEGE AT GLOUCESTER COUNTY
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200.10  PROJECT CLOSEOUT

PART 1:  GENERAL

Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for ENGINEER'S inspection. Provide submittals to ENGINEER that are required by governing or other authorities. Submit application for final payment identifying total adjusted Contract sum, previous payments, and sum remaining due.

1.03 FINAL CLEANING

Execute final cleaning prior to final inspection. Clean all storm pipes and sanitary sewer pipe lines, gutters, storm inlets and all exposed areas of site improvements.

Clean the basin bottoms of all debris with low pressure equipment designed to comply with the Stormwater Management Best Management Practices and NJAC 7:8.

Verify that the sand layer and underlying soils are compacted only to the extent that the required permeability is achieved. If compaction is excessive, remove the sand, rework the basin bottom accordingly, and replace the sand without reducing the permeability of the underlying soils.

Clean site, sweep paved areas, rake clean landscape surfaces. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.04 PROJECT RECORD DOCUMENTS

Maintain on site, one set of the following record documents; record actual revisions to the Work:

1. contract drawings
2. specifications
3. addenda
4. change orders and other modifications to the Contract
5. reviewed shop drawings, product data, and samples

Store record documents separate from documents used for construction. Record information concurrent with construction progress.

Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. manufacturer's name and product model and number
2. product substitutions or alternates utilized
3. changes made by addenda and modifications

Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured depths of foundations in relation to finish floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract Drawings.
ROWAN COLLEGE AT GLOUCESTER COUNTY
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Submit documents to ENGINEER with final Application for Payment.

1.05 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide products, spare parts, maintenance and operation manuals, and extra materials in quantities specified in individual specification sections.

200.11 SOIL EROSION AND SEDIMENTATION CONTROL

PART 1: GENERAL

1.01 SCOPE OF WORK

Work to be performed under this Section refers to temporary and permanent vegetation covers, mulching and baling at the construction site and all areas disturbed during construction, including borrow areas. In addition to the requirements of these Specifications, the CONTRACTOR will comply with all local Conservation District laws, rules and regulations and all other Federal, State, and local requirements for erosion and sediment control.

The College has no control of the Soil Conservation District or its inspectors. The measures shown in the contract plans have been reviewed and approved by the District, but the District reserves the right to direct additional measures if needed to ensure compliance with their rules.

Whenever directed by the Soil Conservation District or the Construction Manager, furnish, install and maintain additional soil erosion control measures as directed.

Any fines or stop work orders shall be the sole responsibility of the Contractor. Fines by the District will be deducted from the contractor's earnings.

1.02 STANDARDS

The CONTRACTOR shall comply with the highest erosion and sedimentation control standards, whether Conservation District, Federal, State, or local. If the CONTRACTOR is in doubt as to the applicable standard, he shall notify the ENGINEER and comply with the ENGINEER'S directions. The local Soil Conservation District shall be notified 72 hours prior to any land disturbance activity.

PART 2: PRODUCTS

2.01 MATERIALS-GENERAL

All materials such as seeds, mulch and bales, silt fences, etc, shall conform to the Specifications of the Conservation District and all other applicable Federal, State and local requirements and as shown on the Contract Drawings.

PART 3: EXECUTION

3.01 GENERAL

Prior to construction, diversion ditches with catch basins and drains shall be constructed at the lowest area of the sites in question. All run-off water will be directed to these locations.

The settled water from the catch basins shall be drained to the natural local drains. The catch basins shall be cleaned regularly. The area shall be seeded with appropriate seed in the required amount per acre and mulched after final grading.

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Permanent vegetation cover, mulching and baling shall be in accordance with the Conservation District specifications and all other applicable Federal, State and local requirements.

END OF SECTION
SECTION 201 CLEARING SITE

201.11 CLEARING SITE

PART 1:  GENERAL

1.01 WORK INCLUDED

This work shall include the removal of all objectionable material and other obstructions interfering with the proposed construction project, such as, but not limited to: rubbish, junk, trees, stumps, brush, roots, down timber, wood, concrete, building remains, and any other vegetation within the project area, and/or as defined by the drawings.

Any electrical, utility, or irrigation lines encountered during the work will be preserved by the Contractor until a determination has been made to remove or relocate the lines.

Contractor shall dispose of any trash and debris on a daily basis.

Noise and dust control shall be a priority at all times. In no case will dust, debris or excessive noise be permitted to leave the work area or reach pedestrians or other college facilities.

All sawcutting and jack hammering shall be by wet methods with supplemental vacuum or other as needed to ensure that silica dust and other hazardous or potentially objectionable dusts are not air entrained, wind blown, or tracked from the work site.

PART 2:  MATERIALS

Water and proprietary dust control additives shall be used as needed during Clearing Site and as needed until final stabilization is achieved.

The Contractor shall submit materials information on any products to be used.

Waste material common to construction shall include, but not be limited to, the following:

Solid Waste: Equipment and materials resulting from demolition or restoration work, large pieces of asphalt or concrete, steel, asphalt shingles, wood, lumber, nails, windows, aluminum siding, doors, trees, stumps, bricks, wire, fences, drums, rubbish and construction debris generated by construction activities and rubble.

Asbestos Cement Pipe: This material shall be removed and disposed of in strict conformance to current OSHA Standards and NJDEP Regulated Waste Requirements. Contractor shall submit a Manifest to the Engineer indicating the ultimate disposal site, which shall be an approved receiving facility.

The CONTRACTOR shall collect and promptly dispose of all waste materials in the area of the work. Waste materials shall not be burned or buried on the Work Site.

No additional compensation will be made if such materials are encountered and special abatement procedures are required.

Collection and disposal of waste shall be a continuous function. The CONTRACTOR shall remove all waste materials before moving to other sections of the Work.

Waste materials shall be disposed of at sites approved by the NJDEP’s Office of Solid Waste Administration, which are compatible with the nature of materials being disposed. A complete listing of sites currently authorized by the NJDEP may be obtained from the Office of Solid Waste Administration, NJDEP, 32 East Hanover Street, Trenton, New Jersey 08625, Phone: (609) 984-4083.

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Waste materials shall be transported by vehicles properly licensed to transport solid waste by the NJDEP, Office of Solid Waste Administration.

PART 3: EXECUTION

Pre-Construction Photographs

The Contractor shall, at no extra cost, take color photographs and video recordings of the site prior to the commencement of construction. The photographs or video record shall accurately depict the existing pre-construction condition of all curbs, sidewalks, driveways, fences and any and all areas subject to construction activities and adjacent within 50 feet of the ‘site’. The date of all photographs or video tapes, as well as identification as to the location which the photographs depict must be provided.

1. The Contractor shall perform the work of clearing and grubbing to include the removal all existing improvements and other items within the work area as needed for construction of the work.

2. Any existing improvements found within the work limits, that are not called for to be removed, shall be preserved or protected, unless and until the Construction Manager authorizes the removal or abandonment of the items.

3. Until authorization is received to remove any item, that item shall remain the property of the Owner. Upon request, such removed items shall be carefully handled and delivered to the Facilities Manager, at the location on campus has he may request.

4. All materials removed by the clearing and grubbing operations or by excavation, not to be retained by the Owner, shall be removed from the project or otherwise disposed of by the Contractor.

5. Grading operations shall not be started in any areas until the clearing and grubbing operations have been completed, except that stumps may be removed in excavation areas during the grading operations.

6. The indiscriminate cutting or removal of trees will not be permitted. Living trees beyond the limit of the grading shall be cut or removed only as specified or directed. All trimming shall be done by skilled workmen and in accordance with good tree surgery practices. Paint required for cut or scarred surfaces of trees or shrubs selected for retention shall be an approved asphaltum base paint prepared especially for tree surgery.

6. Within areas where clearing and grubbing is to be made, the entire easement width the ground shall be cleared of all living or dead trees, stumps, brush, or other objectionable vegetation. All embedded stumps or root mats shall be removed to a depth of not less than two feet below the subgrade of slope surface.

7. The removal and disposal of Elm trees in all counties of the State are subject to provisions of State laws and to regulations of the State Department of Agriculture. Before removing any trees within the site of the project, the Contractor shall consult the plant pathologist of said department and shall comply with his instructions relating to the removal of Elm trees and the marking, segregation and disposal of Elm wood. The Contractor shall submit to the said plant pathologist an “Application for Instructions for Disposal of Encountered Elm Wood: on the form supplied by the New Jersey Department of Agriculture.

8. When shown on the drawings or field conditions warrant, topsoil shall be removed to the desired depth and stockpiled.

END OF SECTION
PART 1: GENERAL

This section includes excavating, backfilling, trenching, grading, compacting, and handling of earthen materials for all site work. Where applicable, and directed by the Architect, this section will also apply to earthwork within the building envelope.

Utility Coordination & Protection

CONTRACTOR shall notify all utility companies that construction of the work under this Contract will pass through the areas where their services exist. Notification to the utilities must be made in a sufficient amount of time in advance (min. 72 hours) prior to start of any construction work in the affected areas.

Utility Mark Out Telephone Number 1-800-272-1000

Materials for temporary support, adequate protection, and maintenance for all underground and surface utility structures, drains, sewers and other obstructions encountered in the progress of the work shall be furnished by the CONTRACTOR at his own expense.

Test pits required at various locations of potential conflict with existing and proposed utilities shall be performed as a first item of work following establishment of soil erosion and site security measures. The contractor shall, at his own expense, conduct test pits as needed to verify that he can complete the work and which items will require relocation or other protective measures, prior to submitting his schedule of work.

Where the grade or alignment of the pipe is obstructed by existing utility structures such as conduits, ducts, pipes, branch connections to main sewers, or drains, the obstruction shall be permanently supported, relocated, removed or reconstructed by the CONTRACTOR in cooperation with the owners of such utility structures. Before proceeding the CONTRACTOR must reach an agreement with the ENGINEER on method to avoid obstruction.

No deviation shall be made from the required line or depth except with the consent of the ENGINEER.

All items damaged or destroyed by construction and subsequently repaired must be properly maintained by the CONTRACTOR.

Should any water lines or service lines be broken or damaged by the CONTRACTOR during pipe installation, the OWNER may make the necessary repairs or allow the Contractor to make them. If the Owner makes the repairs, the CONTRACTOR will be billed by the OWNER for the cost of the repairs.

Should the CONTRACTOR desire to temporarily remove existing service lines for his own convenience in order to facilitate pipe installation, the CONTRACTOR can make arrangements with the OWNER. The OWNER will bill the cost of the temporary removal to the CONTRACTOR.

Where it is necessary to relocate an existing utility or structure, the work shall be done in such a manner as is necessary to restore it to a condition equal to that of the original facility. No such relocation shall be done until approval is received from the owner of the utility or structure being changed.

SEPARATION OF WATER MAINS, SANITARY SEWER AND STORM SEWERS

A. General
The following factors should be considered in providing adequate separation

1. Materials and type of joints for water and sewer pipes,
2. Soil conditions,
3. Service and branch connections into the water main and sewer line,
4. Compensating variations in horizontal and vertical separations,
5. Space for repair and alterations of water and sewer pipes,
6. Off-setting of pipes around manholes.

B. Parallel Installation

Water mains shall be laid at least 10 feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, the State Environmental Protection Agency may allow deviation on a case-by-case basis, if supported by data from the ENGINEER. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer.

C. Crossings

Whenever water mains must cross building drains, storm drains, or sanitary sewers, the water main shall be laid at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer, and at least 12 inches above or below a drain. This vertical separation shall be maintained for the portion of the water main located within 10 feet horizontally of any sewer or drain it crosses.

202.1 DEWATERING

PART 1: GENERAL

1.01 GENERAL

The dewatering of all areas where work must be performed under this Contract is the responsibility of the CONTRACTOR and no additional sum will be allowed for any dewatering operation, overtime, equipment rental, or any other expense incurred due to the occurrence of ground water, surface water or water from possible leakage of existing buildings, structures and piping in the vicinity of the CONTRACTOR’S operations.

Should water be encountered, the CONTRACTOR shall furnish and operate suitable pumping equipment of such capacity adequate to dewater the trench. The trench shall be sufficiently dewatered so that the laying and joining of the pipe is made in the dry. The CONTRACTOR shall convey all trench water to a natural drainage channel or storm sewer without causing any property damage in strict accordance with state and/or local requirements. Trenches shall remain in a dewatered state until backfilling has been completed.

Disposal of silt and debris which accumulates during construction shall be performed in strict accordance with state and/or local requirements.

The Contractor shall be responsible to investigate the site and groundwater conditions prior to bidding the Contract.
1.02 PERMITS

The CONTRACTOR shall be responsible for obtaining and paying for any permits required for dewatering and disposal.

202.2 EXCAVATING, TRENCHING, BACKFILLING, AND COMPACTING

PART 1: GENERAL

1.00 WORK INCLUDED

This section includes all excavation and backfill for items to be constructed, removed or relocated.

All excavation shall be in compliance with the Rules and Regulations of the State of New Jersey Department of Labor and Industry, Bureau of Engineering and Safety, N.J.A.C. 12:180, any OSHA safety regulations that are associated with such activities, and the Soil Conservation District.

Refer to the Contract Drawings for the locations where earthwork and backfill materials are to be used.

THE CONTRACTOR WILL BE REQUIRED TO PROTECT EXISTING SITE SOILS FROM SATURATION DURING THE WORK. PAVING OF THE PARKING LOT TO TOP OF BASE PAVEMENT SHALL BE DONE PRIOR TO STRIPPING AND EXCAVATING FOR THE BUILDING. STABILIZATION OF DISTURBED AREAS SHALL BE DONE DURING THE WORK AS SOON AS POSSIBLE. DO NOT ALLOW EXPOSED SOIL AREAS TO BECOME SATURATED DURING THE WORK. PROVIDE TEMPORARY GRADING, GRAVEL COVER, AND ALL ELSE REQUIRED TO AVOID ACCUMULATING RUNOFF WITHIN THE SITE. REMOVE AND REPLACE SATURATED, SOFT, OR LOOSE SOILS AS DIRECTED AT CONTRACTOR'S SOLE COST. NO PAYMENT WILL BE MADE FOR REPLACING OR REWORKING SOILS THAT HAVE BEEN EXPOSED TO PRECIPITATION OR THAT ARE NOT SUITABLE FOR SUPPORT OF THE BUILDING AND SITE IMPROVEMENTS.

Paving of the parking lots shall include parking stalls, aisles and any repair areas e.g. trenches.

The trench paving repair for the storm drain shall be repaired with HMA Base Course to a flush surface with the adjacent driveway pavement. Prior to final paving of the new parking lot, the top surface of the driveway patch shall be milled or cut out to 2 inch depth with clean saw cuts 1 ft wider than the base patch. Hot seal and surface pave the 2 inches for a final repair that is smooth, and flush with the adjacent pavement. Cracks, open joints, or depression of any amount following final surface course of the repair shall be cause for rejection and replacement of the repair as directed.

1.01 SUBMITTALS

All materials to be used for backfill, including common fill and bedding materials, shall be approved by ENGINEER prior to placing the materials in the pipe trench. All backfill and bedding materials must be tested as directed by the ENGINEER.

Samples of the materials shall be submitted to an approved testing agency for analysis. The test results and report stating that the materials meet the requirements of these Specifications and the Specifications of Federal, State and local authorities (where applicable) shall be submitted to the ENGINEER for approval prior to ordering or using material.
2.01 GENERAL

Soils used as backfill, embankment or otherwise in the work shall conform to the following:

2.02 BACKFILL MATERIALS

A. Bank Run Sand and Gravel

Bank run sand and gravel (soil aggregate Type I-2) shall be bank run supply, free of clay and foreign material, as approved by the ENGINEER. Bank run sand and gravel (soil aggregate Type I-2) shall meet the following gradation:

<table>
<thead>
<tr>
<th>U.S. Sieve Size</th>
<th>Percentage by Weight Passing Square Mesh Sieves</th>
</tr>
</thead>
<tbody>
<tr>
<td>2”</td>
<td>100</td>
</tr>
<tr>
<td>¾”</td>
<td>65-100</td>
</tr>
<tr>
<td>No. 4</td>
<td>40-75</td>
</tr>
<tr>
<td>No. 5</td>
<td>5-30</td>
</tr>
<tr>
<td>No. 200</td>
<td>0-7</td>
</tr>
</tbody>
</table>

Samples of bank run sand and gravel from all proposed sources shall be submitted in accordance with Section 106.03, “Materials, Inspections, Testing and Samples.”

Bank run sand and gravel, meeting the above specification shall be used for “Select Backfill” on an “If and where directed” basis authorized by the Engineer. In circumstances when existing material is deemed unsuitable for re-use in trench backfilling, the Engineer will provide written authorization to furnish, place and compact Select Backfill in accordance with the NJDOT Standard Specifications, dated 2007, as amended thereto.

B. NJDOT No. 57 STONE

Broken stone or screened gravel (NJDOT No. 57) shall be clean, hard aggregate, shall be accurately leveled to required grades, and where required shall be compacted by tamping or other approved means. The broken stone or screened gravel (NJDOT No. 57) shall conform to the following gradation:

<table>
<thead>
<tr>
<th>U.S. Standard Sieve Size</th>
<th>Percent Finer By Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1½”</td>
<td>100</td>
</tr>
<tr>
<td>1”</td>
<td>95-100</td>
</tr>
<tr>
<td>½”</td>
<td>25-60</td>
</tr>
<tr>
<td>No. 4</td>
<td>0-10</td>
</tr>
<tr>
<td>No. 8</td>
<td>0-5</td>
</tr>
</tbody>
</table>

Broken stone shall be construed as the ¾” clean stone pipe bedding and sub-base material to be used by the Contractor when work is in wet conditions. Contractor shall be responsible for placing a stone bedding beneath all pipe, ductile and PVC, to the depths and widths necessary to establish a firm well drained base for pipe installation.

Broken stone shall also be used within any underdrains to be constructed at the direction of the Engineer.

C. Structural Fill

Should structural fill be required, the imported load bearing soil must meet the following criteria:
• Free of organic matter, ash, cinders, and demolition debris
• Particle size distribution that is well graded
• Plasticity index less than 10

<table>
<thead>
<tr>
<th>U.S. Sieve Size</th>
<th>Percentage by Weight Passing Square Mesh Sieves</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>100</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>65-100</td>
</tr>
<tr>
<td>No. 10</td>
<td>40-85</td>
</tr>
<tr>
<td>No. 30</td>
<td>20-65</td>
</tr>
<tr>
<td>No. 60</td>
<td>10-45</td>
</tr>
<tr>
<td>No. 200</td>
<td>5-12</td>
</tr>
</tbody>
</table>

### 2.03 FILTER FABRIC

Filter fabric shall be non-woven, synthetic fiber material with sieve design to keep the bedding and other specified materials separate from the surrounding soils. Filter fabric shall also include materials designed to keep backfill soils out of pipe penetrations, and joints. The material shall have a minimum thickness of 15 mils, tensile strength of 130 lbs., elongation at break of 62% and trapezoidal tear strength of 70 lbs. The opening size shall be selected for the specific soils in accordance with manufactures and ASTM standards.

Filter fabric shall be used to surround any underdrains, and around all stormwater pipe joints, and all pipe penetrations into inlets, outlets and control structures. Minimum overlap shall be 12-inches and 12 inches each side of a joint.

### PART 3: EXECUTION

#### 3.01 CONSTRUCTION EQUIPMENT

The CONTRACTOR shall select his equipment such that, to the maximum extent possible, damage to existing surfaces and structures is minimized. It is the CONTRACTOR's responsibility, to repair, at his expense, any damages due to the use of any equipment to complete the work.

#### 3.02 NOISE, DUST AND ODOR CONTROL

Noise and dust control shall be a priority at all times. In no case will dust or debris or excessive noise be permitted to leave the work area or reach pedestrians or college facilities.

All sawcutting and jack hammering shall be by wet methods with supplemental vacuum or other as needed to ensure that silica dust and other hazardous or potentially objectionable dusts are not air entrained, wind blown, or tracked from the work site.

Compliance with O.S.H.A and County Health Department requirements is mandatory.

Excavation and placement of soils shall be done with adequate moisture controls to ensure effective dust controls.
3.03 PROTECTION OF TREES

Special care shall be taken to avoid damage to trees and their root system. Machine excavation shall not be used when, in the opinion of the ENGINEER, it would endanger the tree. In general, where the line of trench falls within the limits of the limb spread, headers are required across the trench to protect the tree. The operation of all equipment (particularly when employing booms), the storage of materials, and the disposition of excavation shall be conducted in a manner which will not injure trees, trunks, branches or their roots unless such trees are designated for removal.

3.04 TRENCH SUPPORT

Where necessary, particularly to prevent disturbance, damage or settlement of adjacent structures, pipelines, utilities, improvements or paving, excavation shall be adequately sheeted and braced. Details of sheeting and bracing shall be submitted to the ENGINEER prior to installation.

Sheeting and bracing shall remain in place until the pipe has been laid, tested for defects and repaired, if necessary, and the earth around the pipe compacted to a depth of two feet over the top of the pipe. Sheetig and bracing of all excavation shall comply with the latest statutes of the State of New Jersey governing safety of Workers in the Construction Industry.

Where sheeting and bracing systems are used, they must be designed by a Professional ENGINEER licensed in the State of New Jersey. The CONTRACTOR shall submit a sheet plan to the ENGINEER as proof that the design has been done; however, this submittal will not be considered as a shop drawing and the ENGINEER will not be responsible for the adequacy or safety of the sheeting design or installation. The sheeting design shall conform to all applicable requirements of the New Jersey Construction Safety Code and the Occupational Health and Safety Act.

Any damage to new or existing structures occurring through settlement, water or earth pressure, or other causes due to inadequate bracing or through negligence or fault of the CONTRACTOR in any other manner, shall be repaired by the CONTRACTOR at his own expense.

The CONTRACTOR shall specifically comply with OSHA Standards for Excavations (29 CFR Part 1926), "OSHA Standards." As such, the CONTRACTOR shall be responsible for providing a "competent person" as defined in the OSHA Standards and as required by the standards. The CONTRACTOR shall be solely responsible for the selection, design, installation, and implementation of all "protective systems" as defined in the OSHA Standards. The pipeline design by the OWNER, the ENGINEER, or the ENGINEER's Consultant does not include the design of the "protective systems" since the design of the "protective systems" is the responsibility of the CONTRACTOR.

3.05 EXCAVATION AND BOTTOM PREPARATION

A. General Excavation

General excavation shall consist of the satisfactory removal, separation and stockpiling of earth as required to construct the work. Excavation below existing ground line to enable any required construction or removals is included. It is expressly understood that any reference to earth, rock, silt, debris or other materials on the Drawings or in the Specifications is solely for the OWNER's information and shall not be taken as an indication of classified excavation or the quantity of earth, rock, silt, debris or other material encountered.

Existing top soil shall be separated and stockpiled for use on site. The stockpile shall be maintained, reworked and protected as needed to ensure the top soil remains viable. Prior to placement in the finished work the top soil shall be tested and a plan for addition, modification, and fertilization shall be submitted.

All excavation shall be made to the lines and grades indicated on the Drawings or established in the field by the ENGINEER.
Excess excavated materials and excavated materials unsuitable for backfilling shall be properly disposed of by the CONTRACTOR clear of the site. The CONTRACTOR shall furnish to ENGINEER satisfactory evidence that an appropriate disposal site will be used.

Open trench shall never exceed 200 feet in advance of pipe laying and shall be reduced as required by conditions encountered.

Where an unstable or flowing soil condition is encountered in the trench wall, such as may be found by excavation below ground water or in weak or non-cohesive soils, this condition must be stabilized before laying the pipe. Depending upon the severity of the condition, the Engineer may direct, or the Contractor may elect to use tight sheeting, skeleton sheeting, stay bracing, trench jacks, or a trench shield or box to support the trench during pipe laying operations. If the condition is too severe, it may be necessary to leave the sheeting in place.

Temporary support, adequate protection and maintenance of all underground and surface utility structures, drain, seers and other obstructions encountered in the progress of the work shall be furnished by the Contractor at his own expense under the direction of the Engineer.

Where the grade or alignment of the pipe is obstructed by existing utility structures such as conduits, ducts, pipes, branch connections to main sewers or main drains, the obstruction shall be permanently supported, relocated, removed or reconstructed by the Contractor in cooperation with owners of such utility structures.

No deviation shall be made from the required line of grade except with the written consent of the Engineer.

Prior to placing bedding, pipe or concrete within any excavation, the bottom of the excavation shall be proofrolled or otherwise compacted to a density of not less than 95% of maximum dry density as determined by ASTM D-1557. Testing shall confirm that the top 8 inches of the bottom of the excavation has been so compacted.

No excavation or backfilling shall be performed during periods of rain or when soil moisture is excessive. All excavations shall be protected, graded, and drained to ensure that standing or flowing water or runoff does not compromise the soil or interfere with proper production and compaction.

B. Trench Width

Widths of trenches shall be held to a minimum to accommodate the pipe and appurtenances. The trench width shall be measured at the top of the pipe barrel and shall conform to the following limits:

Minimum: Outside diameter of the pipe barrel plus 8 inches, i.e., 4 inches each side.

Maximum: Outside pipe diameter plus 24 inches.

If required by the type of joint used, the trench shall be widened at the joints to provide clearance for proper jointing.

If, for any reason the trench width exceeds the maximum trench width defined in Paragraph B, "Trench Width", the CONTRACTOR shall provide additional bedding and backfill material as specified in Section 202.04-2.02 to fill the additional width of trench, at no cost to the OWNER.

C. Trench Depth

1. General. All watermain trenches shall provide for a minimum of 48 inches of cover over the top of the pipe barrel to the top of the finished grade of the roadway unless otherwise authorized by the ENGINEER. Excavations shall not exceed a side-slope of 1 ft. horizontal to 2 ft. vertical (1:2).
2. Sanitary sewers shall have not less than 36 inches cover to finished grade.

3. Storm sewers shall have not less than 1 ft of cover over the pipe to finished grade.

4. Electrical duct banks, gas and communications conduits shall be buried in accordance with the applicable codes and requirements elsewhere in the project documents.

5. Earth. The trench shall be excavated to the depth required, so as to provide a uniform and continuous bearing and support for the pipe barrel above the bedding on solid and undisturbed ground at every point between joints, except that it will be permissible to disturb the finished trench bottom over a maximum length of 18 inches near the middle of each length of pipe: by the withdrawal of pipe slings or other lifting tackle. When required, bell holes shall be provided. The finished trench bottom shall be accurately prepared by means of hand tools. Bell holes and sling slots shall be backfilled by hand prior to proceeding with initial backfill.

6. Rock. Where excavation is made in rock or boulders, the trench shall be excavated 8 inches below the pipe barrel for pipe 12 inches in diameter or less, and 12 inches below the pipe barrel for 16 inch diameter pipe and larger. All loose material shall be removed from the trench bottom. After preparation of the trench bottom, a pipe bed shall be prepared using bedding material as specified in Section 202-15.

7. Unsuitable Bottom. When unsuitable material is found below subgrade, as determined by the ENGINEER, CONTRACTOR shall remove the material to a depth determined by the ENGINEER, and provide compacted bedding material to backfill the trench in the area where unsuitable material has been excavated. Payment of unsuitable bottom shall be included in the cost of pipe installation.

3.06 TRENCH BACKFILLING

A. Bedding

All structures shall be placed atop 6-inches of crushed stone with no exceptions taken.

All pipes and ducts where directed shall be place in formed class B bedding not less than 6 inches thick. However, class B bedding, or other coarse or crushed aggregate shall not be used for stormwater discharge pipes within 50 feet of a basin outlet control structure. Existing soil shall be thoroughly compacted and shaped to form the support for the pipe.

B. Initial Backfill

Backfill around the pipe, or footing and up to a cover of at least 12 inches over the top of the pipe or footing shall be placed by hand in 6-inch layers, each layer to be thoroughly compacted to 95% of maximum dry density by mechanical tampers of an approved type. Backfill material shall be approved site soils or structural fill. Care shall be taken to avoid damaging or moving the pipe.

C. Trench Backfill

All backfill above a plane 12" over the pipe is to be placed in lifts not exceeding 8 inches, loose measure, and compacted to at least 95% of its maximum dry density established by ASTM D-1557. The trenches and excavations shall be wet down, or the excavated material shall be dried as required to obtain within 2 percent of optimum moisture content while the backfilling is being carried out. The CONTRACTOR may use mechanical equipment to place the backfill. This shall be done in such a manner that the material does not free fall, but shall be so placed that it will flow onto the previously placed material.
All trenches shall be backfilled, compacted and base paved in a timely fashion. All base paved surfaces shall be allotted a minimum of 60-days settlement time prior to final paving of road surface.

D Surface Conditions

The trench surface shall be regularly attended to during the course of the Contract. The CONTRACTOR shall take prompt corrective measures to correct any settlement or wash-out. The trench surface shall be maintained in a safe condition and shall not interfere with natural drainage.

3.07 FOUNDATION EXCAVATION & BACKFILL

Where a foundation is located on the Contract Drawings, the Contractor shall properly prepare and compacting the subgrade for the foundation. After excavation to grade, the surface shall be rolled, tamped or otherwise consolidated to compacted to at least 95% of its maximum dry density established by ASTM D-1557 and adequately prepare the bottom for the loads to be placed upon it. Where required, broken stone shall be placed on the surface and shall be rolled or tamped into the subgrade in such thickness as may be required by the Engineer.

Prepared excavations shall be protected from rain, or other disturbances until acceptance of the Work. The prepared subgrade will be tested prior to placing bedding materials or concrete. All unsuitable materials shall be recompacted or removed and replaced at the direction of the Construction Manager.

The placing of pipelines or the pouring of foundations or floor slabs is to commence within twenty-four (24) hours of final approval of the bedding. Rain, frost and other factors which in the opinion of the Engineer are potentially damaging to the subgrades, and which occur after the final approval but before or during the pouring, will require another inspection of the subgrade by the Engineer. The Contractor is to correct any deficiencies found at this time, at his own expense.

3.09 BACKFILLING AT STRUCTURES

A. Placement of Backfill

The Contractor is to backfill structure excavations as promptly as the work permits, but not until the completion of the following:

a. The removal of all concrete formwork.

b. Inspection by the Engineer of the construction below the finished grades including, where applicable, damp-proofing, waterproofing, and perimeter insulation.

c. Inspection, testing, approval, and recording locations of underground utilities.

d. The removal of shoring and bracing and subsequent backfilling of voids with satisfactory materials.

e. The removal of all trash and debris.

Backfill is to be spread by mechanical equipment or by manual means and is to be mixed thoroughly and spread in lifts. Backfill is to be built up in horizontal layers as nearly even as practicable to prevent the thickness of any lift from exceeding 12 inches.
B. Compaction of Backfill

The backfill is to be compacted near optimum moisture content by means of vibratory compactors to 95% of its established Modified Proctor Density established in accordance with ASTM Designation D 1557-72T Method C. Should the obtained density of the compacted fills be less than specified, the Contractor is to recompact the area until the required maximum density is reached. Only hand held compaction equipment is to be used within four feet (4') of existing and proposed structures.

Each successive lift shall not be placed or compacted until the previous lift is inspected and approved by the Engineer.

C. Moisture Content

The moisture-density curve for the backfill material used is to be employed as a guide in controlling moisture so as to achieve the required degree of compaction. When fill materials become too wet for the required compaction, they shall be dried by a method approved by the Engineer prior to commencing or continuing compaction operations. Likewise, if the fill materials become too dry for the required compaction, they are to be moistened by a method approved by the Engineer prior to commencing or continuing compaction operations. Moisture content shall be controlled to within 3% of optimum moisture content.

3.09 BACKFILLING SITE AREAS

Areas of embankment and areas not otherwise required to be compacted to 95% shall be compacted to 90% of maximum dry density as determined by ASTM D-1557. This includes lawn areas, landscape areas, and basin berms. All other areas within the site except for the bottom of the basins shall be compacted to 95% of the modified proctor density.

3.10 REMOVAL OF EXISTING FILL MATERIAL & REPLACEMENT WITH STRUCTURAL FILL

The Contractor shall maintain a maximum slope of 2 to 1 in the area where the building excavation work is being performed. The Contractor must place the structural fill in lifts not exceeding ten (10) inches in loose thickness and compacted to 95% using a smooth drum vibratory roller having a minimum static weight of 10 tons. All fill must be placed at the optimum moisture content of +/- 2% as determined in accordance with ASTM standard D1557. There is no additional compensation for any extra structural fill required in the area of the building footing.

END OF SECTION
SECTION 203  CONCRETE

Part 1:  GENERAL

This work will include the labor, materials and equipment to excavate and construct concrete sidewalks, 4" thick. This work shall also include the procedures for constructing concrete bases for various structures and the concrete/concrete brick detectable warnings and walkway to the entrances of the buildings.

1.01 REFERENCES

American Concrete Institute
ACI 1347R-88, "Guide to Formwork for Concrete".
ACI 301-89, "Specifications for Structural Concrete for Buildings".
ACI 304R-89 "Guide for Measuring, Mixing, Transporting and Placing Concrete"
ACI SP-66 (88), "ACI Detailing Manual".
ACI 318-89 (92), "Building Code Requirements for Reinforced Concrete and Commentary".

American Welding Society
AWS D12, "Recommended Practices for Welding and Reinforcing Steel, Metal
"Inserts and Connections in Reinforced Concrete Construction".

Concrete Reinforcing Steel Institute
"Manual of Standard Practice".

In the event of a conflict between the above references and these Specifications, the one having the more stringent requirements shall govern.

1.02 STANDARD REQUIREMENTS

In addition to the below listed requirements, please refer to NJDOT Standard Specifications, 2007 for all concrete related requirements.

The Contractor is to furnish all labor, equipment and materials required to comply with the intent of the Contract Drawings pertaining to concrete work. All tests, samples, shop drawings, and certifications are to be provided in a timely manner in order not to delay the review process or the construction schedule.

1.03 SUBMITTALS

Prior to the start of any construction at the Project Site or ordering of any materials associated with the concrete construction, the Contractor shall meet with the Owner and submit, for his review and approval, his proposed construction methods. This shall include, but not necessarily be limited to: form section layout and construction, control of exposed concrete color variation, finishing techniques to be employed, and methods of curing.

All design mixes, tests on reinforcing steel and other aspects of quality control are included in this and other Divisions of the Specifications. All shop drawings and material samples required to expedite the work of this Division are to be submitted in sufficient time by the Contractor to allow for the proper review and approval by the Engineer without delaying the progress of the work.

Submit NJDOT approvals of the mix design, aggregate and cement sources and any admixtures that may be incorporated in the work.
Part 2: **PRODUCTS**

All concrete shall conform to NJDOT requirements for Class B concrete. 
Only pre-approved NJDOT mix designs shall be permitted to be used in the work.

Refer to the NJDOT Standard Specifications, 2007 Section 903.03 for concrete material requirements.

Part 3: **EXECUTION**

3.1 **APPROVALS**

The plans identify the general layout of all concrete items. 
Detailed layout of the formwork shall be done to ensure compliance with the Barrier free subcode and the 2010 guidelines for compliance with the Americans with Disabilities Act. 
Prior to pouring concrete, the Owner shall inspect and approve the formwork. Any deficiencies must be corrected immediately.

3.2 **CONSTRUCTION**

All concrete work shall be constructed as noted on the plans and details unless otherwise directed in the field by the Owner. Layout control and expansion joints are at spacings of 8 ft on center and 24 ft on center respectively. 
Expansion joints shall be located at all foundations, and existing walks and structures. Adjust locations of joints to control cracking at re-entrant corners and to ensure thin wedges are allowed to shrink and expand without uncontrolled cracking. Joint locations shall also be adjusted to achieve a pleasing and nearly uniform pattern which shall be subject to the approval of the Construction Manager.

**NO WATER SHALL BE ADDED TO ANY CONCRETE AFTER IT IS BATCHED AT THE PLANT.**
**NO WATER SHALL BE APPLIED TO THE SURFACE DURING FINISHING OR WITHIN 4 HOURS OF PLACEMENT.**

Concrete may be placed with any desired slump and may be produced with water reducing admixtures conforming to ASTM and NJDOT standards.

Placements shall be made in the morning with due regard to the time required for setting, finishing and curing needed before curing with plastic or blankets is begun. Discoloration or imperfections resulting from improper curing or application of curing methods to soon after placement shall be cause for rejection of the concrete.

All concrete, including but not limited to flat work, shall be consolidated by vigorous mechanical vibration prior to screeding and floating.

All concrete shall be cured with plastic and/or blankets (depending upon the weather conditions) for a minimum of three (3) days. A no time from placement to the completion of the 3 day curing period shall the concrete be allowed to drop below 50 degrees F. Additional blankets, heat, or other approved methods shall be used to ensure the curing complies with these specifications.

All concrete shall receive a light brush finish as approved by the Construction Manager.

**END OF SECTION**
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SECTION 204 – SANITARY SEWERS

204.01 GRAVITY SANITARY SEWER

PART 1 – GENERAL

This work shall include the excavation for and the construction of new gravity sewer laterals for the conveyance of wastewater. The pipe shall be of the type and size specified and shall be constructed at the prescribed locations and in accordance with the plans and specifications or as directed by the Engineer.

Ensure that existing sewer flows are not interrupted without a pre-approved schedule from the Construction Manager.

PART 2 - PRODUCTS

Materials shall conform to the following:

PVC Pipe and Fittings - ASTM D3034-16, SDR 35 Type PSM, Polyvinyl chloride plastic gravity sewer pipe and fittings.

Without intending to limit the materials permitted for the construction of gravity sewer pipe, the Term “PVC Sanitary Sewer” indicated on the Contract Plans shall be interpreted as meaning PVC or approved equal. The use of PVC pipe is predicated on an approval by the New Jersey Department of Environmental Protection (NJDEP) to utilize a design coefficient of roughness (N) of 0.010 in the Manning Formula in determining velocity and pipe capacity. Any pipe material to be considered for installation as an approved equal must be approved by the NJDEP in writing, permitting a reduction in the design coefficient of roughness from 0.013 to 0.010 for the material being considered.

The materials designated on the plans or specified have been selected as a basis of quality and performance and as being most suitable for the service anticipated. The materials will be regarded as a standard; this is not done, however, to eliminate others equally as good and efficient.

Polyvinyl Chloride (PVC) Sewer Pipe - shall be made of PVC plastic having a cell classification of 12454-B or 12454-C or 136364-B (with minimum tensile modulus of 500,000 psi) as defined in ASTM Specification D1784-11. Fittings shall be made of PVC plastic having a cell classification of 12454-B, 12454-C, or 13343-C as defined in specification D1784-11-11. Compounds that have different cell classifications because one or more properties are superior to those of the specified compounds are also acceptable.

PVC pipe and fittings shall be Type PSM, SDR 35, Gravity Sewer Pipe conforming to ASTM D3034-16 for pipe sizes 4 inch through 15 inch.

All fittings shall utilize rubber gasket joints, the rubber gaskets shall comply in all respects with the physical requirements specified in ASTM F-477-14 or C-443-12(2017).

The pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity density, and other physical properties.

Cleanouts shall be located in the grass area. All risers and fittings shall be SDR 35 PVC.

Dimensions:

Pipe Diameter: The average outside diameter of the pipe shall meet the requirements given in Table 1 when measured in accordance with section 8.4.1 of ASTM D3034-16.

Pipe Wall Thickness: Pipe wall thickness shall meet the requirements of Table 1 when measured in accordance with ASTM D3034-16 Section 8.4.2. For those pipes having integral bells, the thickness of the wall in the bell shall be considered.
satisfactory if it was formed from pipe meeting the above requirements.

Fitting Dimensions: Fittings such as couplings, wyes, tees, adapters, etc. for the use in laying PVC Gravity Sewer Pipe shall have dimensions as recommended by the manufacturer.

Flattening: There shall be no evidence of splitting, cracking or breaking when the pipe is tested in accordance with Section 8.6 of ASTM D3034-16.

Pipe Stiffness: Minimum pipe stiffness values for the pipe shall comply with Table IX when test in accordance with Section 8.8 of ASTM D3034-16.

Impact Resistance: The impact resistance of the pipe shall be determined in accordance with Section 8.7 of ASTM D3034-16 and shall comply with the requirements given Table IX. (Note: This test is intended only for use as a quality control test and not for use as a simulated service test).

Joints: Joints made with pipe and fitting shall show no sign of leakage when tested in accordance with Section 8.9 of ASTM D3034-16 for Gasketed Joints. The joint shall provide a positive seal against infiltration or exfiltration. All surfaces of the point upon which the gasket may bear shall be smooth and free of such imperfections, fractures, or crack that could adversely affect sealing the joint.

Transition coupling – Mueller Gap Bridge, stainless steel, with Fernco Fitting

Pipe Marking: Each standard and random length of pipe in compliance with this standard shall be clearly marked per the following example at intervals of 1.5m. (5 ft.) or less:

- Manufacturer’s Name or Trademark
- Nominal Pipe Size
- The PVC Cell Classification
- The Legend “Type PSM Dr 35 PVC Sewer Pipe”

Certification: As the basis of the acceptance of the material, the manufacturer will furnish a certificate of conformance to these specifications. The certification shall be delivered to the engineer before any pipe is delivered to the project site. The manufacturer may be required to furnish other conformance certification in the form of affidavit of conformance, test results, or copies of test reports, as may be deemed necessary by the Engineer or Owner.

**PART 3 - EXECUTION**

All work shall be performed in conformance to Section 652 of the NJDOT Standards Specifications, 2007 unless otherwise directed on the plans or within these specifications.

**Clean Up**

Surplus pipeline materials, tools and temporary structures resulting from the work shall be removed by the Contractor. All debris, pavement, and excess earth from excavations shall be removed and disposed of by the Contractor in compliance with applicable regulations, laws and ordinances.

**204.03 LATERAL CLEAN OUTS**

**PART 1 - GENERAL**

This item of work shall consist of the construction of a sewer lateral clean out complete with combination tee wye, or 45 Degree wye and 45 Degree street elbow, vertical pipe, ferrule and brass plug.

**PART 2 - PRODUCTS**

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Vertical riser pipe shall be 6 inch diameter SDR 35, P.V.C. pipe, Type PSM polyvinyl chloride plastic gravity sewer pipe and fittings conforming to the requirements of ASTM D 3034, SDR 35.

Combination tee wye or 45 Degree wye and 45 Degree street elbow shall be 6 inch diameter SDR 35 PVC, Type PSM Polyvinyl Chlorine Plastic Gravity Sewer pipe fittings conforming to the requirements of ASTM D 3034. Cast iron tee shall be “Tyler” twin cleanout catalog No. 5440 service weight cast iron with PVCC1 adapter or approved equal. Ferrules shall be service weight (SV) cast iron with 6” brass plug.

PART 3 - EXECUTION

All work shall be performed in conformance to Section 652 of the NJDOT Standards Specifications, 2007 unless otherwise directed on the plans or within these specifications.

END OF SECTION
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SECTION 205 – WATER MAINS

205.01 WATER MAIN PIPE

PART 1 - GENERAL

This Section includes all required demolition, abandonment, underground site piping, and interconnection piping required for
the potable and fire system water supply to the buildings.

All work and materials shall conform to the current Deptford Township Municipal Utilities Authority (DTMUA) Rules and
Regulations for potable water services in public rights-of-way. These specifications in no way relieve the CONTRACTOR
from meeting any requirements set forth in the adopted Rules and Regulations of the DTMUA.

CONTRACTOR shall purchase the current Rules and Regulations booklet from the Administrative Offices of the DTMUA,
located at 898 Cattell Road, Wenonah, New Jersey prior to bidding on the project. CONTRACTOR shall conform to any and
all standards set forth and as shown on the details contained within the booklet. Any conflict between these specifications and
the Rules and Regulations that is discovered by the CONTRACTOR should be reported to the OWNER for clarification prior
to bidding.

If conflicts occur during the Contract, then the CONTRACTOR shall notify the Engineer prior to ordering materials or
performing work, so a clarification and/or work directive change may be issued.

DRAWINGS

Any dimensions shown on Contract Drawings are approximate only. The CONTRACTOR shall verify all piping geometry in
the field and shall be responsible for insuring proper alignment and fit of all piping consistent with the intent of the Contract
Drawings. Field layout drawings shall be submitted as required for approval.

CONNECTIONS TO THE EXISTING WATER MAINS

The CONTRACTOR shall inspect, in the presence of the Engineer, the condition and structural integrity of the existing pipe
and determine if the pipe is structurally stable to effectuate the connection, as directed on the plans. If the pipe is intact,
CONTRACTOR shall complete the connection in strict conformance to the Rules and Regulations set forth by the OWNER.

At the direction of the Engineer, relocate the tie-in point of the tee cut-in for the purposes of simplifying future water main
replacements. Cut-in location shall be determined in the field.

PART 2 – PRODUCTS

CONTRACTOR’S RESPONSIBILITY FOR MATERIAL

The CONTRACTOR shall supply and carefully examine all material for defects. Material which is known or thought to be
defective shall not be installed.

The ENGINEER reserves the right to inspect all material and to reject all defective material shipped to the job site or stored
on the site. Failure of the ENGINEER to detect damaged material shall not relieve the CONTRACTOR from his total
responsibility for the completed work if it leaks or breaks after installation. Lay all defective material aside for final
inspection by the ENGINEER to determine if corrective repairs may be made, or if the material is to be rejected. The
ENGINEER shall determine the extent of the repairs.

CONTRACTOR to classify defective pipe prior to ENGINEER’s inspection as follows:

1. Damage to interior and/or exterior paint seal coats.
2. Damage to interior cement-mortar lining.

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3. Insufficient cement-mortar lining thickness.  
4. Poor quality interior paint seal coat.  
5. Pipe out of round.  
6. Damaged pipe barrel area to a point where pipe class thickness is reduced.  
7. Denting or gouges in plain end of pipe.

The CONTRACTOR shall be responsible for all material, equipment, fixtures and devices furnished and such materials, equipment, fixtures and devices shall comply with the requirements and standards of all Federal, State and local laws, ordinances, codes, rules and regulations governing safety and health.

The CONTRACTOR shall be solely responsible for the safe storage of all material furnished to or by him until it has been incorporated in the completed project and accepted by the ENGINEER.

Pipe, fittings, valves, hydrants and accessories shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Pipe handled on skidways shall not be skidded or roped against other pipe. Handling of this material is to be in accordance with AWWA C600-10. Keep fittings and valves drained and stored before installation in a manner protecting them from damage due to freezing of trapped water in accordance with Section 201.06.

PART 3 – EXECUTION

INSTALLATION - GENERAL REQUIREMENTS

All pipe shall be laid and maintained to the required lines and depths. Fittings, valves and hydrants shall be at the required locations with joints centered, spigots home and all valve and hydrant stems plumb and otherwise in strict accordance with the Specifications.

All buried steel lugs, rods, brackets and flanged joint bolts and nuts shall be given one (1) coat of Koppers #50 coal tar coating prior to backfilling and polyethylene encased.

No deviation shall be made from the required alignment, depth or grade except with the written consent of the ENGINEER.

All pipe shall be laid to the depth specified. The depth shall be measured from the final surface grade to the top of the pipe barrel. The minimum pipe cover shall be as shown on the Drawings or as specified in the Specifications.

Do not lay pipe in a wet trench, on subgrade containing frost, and when trench conditions are unsuitable for such work. If all efforts fail to obtain a stable dry trench bottom and the ENGINEER determines that the trench bottom is unsuitable for trench foundation, he will order in writing the kind of stabilization to be constructed.

Thoroughly clean the pipes and fittings before they are installed and this material shall be kept clean until the acceptance of the completed work. Lay pipe with the bell ends facing in the direction of installation, unless otherwise shown on the Drawings, or directed by the ENGINEER. Exercise care to insure that each length abuts against the next in such manner that no shoulder or unevenness of any kind occurs in the pipe line.

No wedging or blocking is permitted in laying pipe unless by written order of ENGINEER.

Before joints are made, bed each section of pipe the full length of the barrel with recesses excavated so pipe invert forms continuous grade with invert of pipe previously laid. Do not bring succeeding pipe into position until the preceding length is embedded and securely in place.

Dig bell holes sufficiently large to permit proper joint making and to insure pipe is firmly bedded full length of its barrel.

Walking or working on completed pipeline, except as necessary in tamping and backfilling, and is not permitted until trench is backfilled one-foot deep over top of pipes.

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Take up and relay pipe that is out of alignment or grade, or pipe having disturbed joints after installation. Take up and replace with new such in-place pipe sections found to be defective. Replacement work shall be at CONTRACTOR's expense. Take necessary precautions to prevent the floating of the pipeline by the accumulation of water in the trench, or the collapse of the pipeline from any cause. Should floating or collapse occur, restoration will be at the CONTRACTOR’s expense.

Bedding materials and concrete work for the pipe bedding and thrust restraint shall be as specified previously in Sections 202 and 203 respectively.

Take every precaution to prevent foreign material from entering the pipe while it is being placed. During laying operations, do not place debris, tools, clothing, or other materials in the pipe.

Close all openings in the pipeline with watertight plugs when pipe installation is stopped at the close of the day’s work or for other reasons, such as rest breaks or meal periods.

Place enough backfill over the center sections of the pipe to prevent floating.

Carry out the cutting of pipe only with equipment specifically designed for that purpose such as an abrasive wheel, rotary wheel cutter, a guillotine pipe saw or a milling wheel saw. The use of chisels or hand saws will not be permitted. Cut ends and rough edges should be ground smooth and for push-on connections. The cut end should be beveled slightly.

In distributing material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

If the pipe is to be strung out, it shall be done so in a straight line or in a line conforming to the route of installation. Each length of pipe shall be adequately blocked to prevent movement. Stockpiled pipe shall also be adequately blocked to prevent movement. No pipe, material, or any other object shall be placed on private property, obstruct walkways or driveways, or in any manner interfere with the normal flow of traffic.

Special care shall be exercised, during handling, temporary storage or construction to avoid damage to the bells, spigots or flanged ends of pipe. If damaged pipe cannot be repaired to the ENGINEER's satisfaction, it shall be replaced at the CONTRACTOR's expense.

The CONTRACTOR shall remove all existing pipe, fittings, valves, pipe supports and blocking and all other items necessary to provide space for making connections to existing pipe and installing all piping which is to be done under this Contract.

The CONTRACTOR shall be responsible for maintaining the minimum required distance between the waterline and other utility lines in strict accordance with all Federal, State and local requirements and all right-of-way limitations.

Maximum allowable deflection at the joints for push-on joint pipe, regardless of pipe material, shall follow manufacturer’s recommendations.

Particular care shall be exercised so that no high points are established where air can accumulate. In the event that unforeseen field conditions necessitate a change in the pipe profile and, in the opinion of the ENGINEER, the resulting change requires the installation or an air release valve and manhole, install the same as extra Work to the Contract. If the CONTRACTOR requests a change in the pipe profile solely for ease of construction, and the requested change requires the installation of an air release valve and manhole as determined by the ENGINEER, then the cost of furnishing and installing the air release valve and manhole will be at the expense of the CONTRACTOR.

CONSTRUCTION METHODS TO AVOID CONTAMINATION

Heavy particulates generally contain bacteria and prevent even very high chlorine concentrations from contacting and killing such organisms. It is essential that the procedures of this section be observed to assure that a water main and its appurtenances are thoroughly clean for the final disaffection by chlorination.
Precautions shall be taken to protect the interiors of pipes, fittings, and valves against contamination. Pipe delivered for construction shall be strung so as to minimize entrance of foreign material. All openings in the pipeline shall be closed with watertight plugs when pipe installation is stopped at the close of the day's work or for other reasons such as rest breaks or meal periods. Rodent-proof plugs may be used where it is determined that watertight plugs are not practical and where thorough cleaning will be performed.

Delay in placement of delivered pipe invites contamination. The more closely the rate of delivery is correlated to the rate of pipe installation, the less likelihood of contamination.

Joints of all pipe in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

Yarning or packing material shall consist of molded or tubular rubber rings, or rope of treated paper or other approved materials. Materials such as jute, asbestos or hemp shall not be used. Packing material shall be handled in a manner that avoids contamination.

No contaminated material or any material capable of supporting prolific growth of microorganisms shall be used for sealing joints. Sealing material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water. It shall be delivered to the job in closed containers and shall be kept clean.

If dirt enters the pipe, and in the opinion of the ENGINEER the dirt will not be removed by the flushing operation, the interior of the pipe shall be cleaned by mechanical means and then shall be swabbed with a 1% hypochlorite disinfecting solution. Cleaning with the use of a pig, swab or "go-devil" should be undertaken only when the ENGINEER has specified such and has determined that such operation will not force mud or debris into pipe joint spaces.

If it is not possible to keep the pipe and fittings dry during installation, every effort shall be made to assure that any of the water that may enter the pipe joint spaces contains an available chlorine concentration of approximately 25 mg/L. This may be accomplished by adding calcium hypochlorite granules or tablets to each length of pipe before it is lowered into a wet trench, or by treating the trench water with hypochlorite tablets.

If the main is flooded during construction, it shall be cleared of the flood water by draining and flushing with potable water until the main is clean. The section exposed to the flood water shall then be filled with a chlorinated potable water that, at the end of a 24 hour holding period, will have a free chlorine residual of not less than 25 mg/L. The chlorinated water may then be drained or flushed from the main.

VALVE INSTALLATION

Prior to installation, inspect valves for direction of opening, freedom of operation, tightness of pressure containing bolting, cleanliness of valve ports and especially seating surfaces, handling damage and cracks. Correct defective valves or hold for inspection by the ENGINEER.

Set and join to the pipe in the manner specified in Section 3.01. Provide valves 12-inch and larger with special support, such as crushed stone or concrete pads, so that the pipe will not be required to support the weight of the valve. Set truly vertical.

THRUST RESTRAINT

Utilize Megalug joint restraints or an approved equal.

205.02 CHLORINATING PIPELINES

PART 1 - GENERAL

SCOPE OF WORK
The CONTRACTOR shall chlorinate all pipelines installed under this Contract in compliance to the DTMUA Inspection and Testing Procedures.

WORK BY OWNER

Subject to the limitations noted in 204.01.1.01, the OWNER will furnish water for testing, flushing and chlorinating pipelines.

PROTECTION

Due to the toxicity of chlorine fumes, persons performing work under this Section shall be equipped with all safety equipment and shall be attended by other personnel who are in the vicinity where work is to be performed. The forward of AWWA Standard B300 contains information and additional reference material regarding the safe handling of hypochlorites. The CONTRACTOR shall familiarize himself with this information prior to performing any disinfection work.

RELATED WORK

Pipeline installation precautions to avoid contamination as described in Specification Section 204.01.

PART 2 - PRODUCTS

MATERIALS AND EQUIPMENT

The CONTRACTOR shall furnish hypochlorite liquid and injection equipment as needed to complete the disinfection of all pipelines.

Sodium hypochlorite is available in liquid form, and contains approximately 12-1/2 to 16% available chlorine. The material should be stored in a cool, dry, and dark environment to minimize its disinfection.

Sodium hypochlorite is to be furnished in accordance with AWWA B300-10.

PART 3 – EXECUTION

PREPARATION

All pipelines shall be pressure and leak tested, flushed, and cleaned of debris and dirt prior to application of the disinfectant. The pipeline is to be kept completely clean and dry during construction.

The CONTRACTOR will be required to submit a procedure for flushing, disinfecting and disposal of chlorinated water to the ENGINEER for approval.

APPLICATION OF DISINFECTANT

The Method to be used for chlorination is detailed in ANSI/AWWA C651-14, “Disinfecting Water Mains,” and is further described herein. Information in the forward of AWWA Standard C651-14 will be helpful in understanding this method.

METHOD OF CHLORINATION (CONTINUOUS FEED)

The continuous feed method consists of filling the main to remove all air pockets, flushing the completed main to remove particulates, and filling the main with potable water chlorinated so that after a 24-hour holding period in the main there will be a free chlorine residual of not less than 15 mg/l.
ROWAN COLLEGE AT GLOUCESTER COUNTY
MEDICINE AND WORKFORCE DEVELOPMENT CENTERS

1. Water from the existing distribution system or other approved source of supply shall be made to flow at a constant, measured rate into the newly laid water main.

2. At a point not more than 10 feet downstream from the beginning of the new main, water entering the new main receive a dose of chlorine fed at a constant rate such that the water will have not less than 15 mg/L free chlorine. To assure that this concentration is provided, measure the chlorine concentration at regular intervals in accordance with the procedures described in the current edition of the AWWA Standard Methods.

Table 1 gives the amount of chlorine required for each 100 feet of pipe of various diameters:

<table>
<thead>
<tr>
<th>Pipe Diameter (Pipes)</th>
<th>100% Chlorine Lbs.</th>
<th>16% Available Chlorine (Gal. NaOCl)</th>
<th>15% Available Chlorine (Gal. NaOCl)</th>
<th>12.5% Available Chlorine (Gal. NaOCl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>.037</td>
<td>.028</td>
<td>.030</td>
<td>.036</td>
</tr>
<tr>
<td>12</td>
<td>.082</td>
<td>.063</td>
<td>.066</td>
<td>.079</td>
</tr>
<tr>
<td>16</td>
<td>.144</td>
<td>.111</td>
<td>.115</td>
<td>.138</td>
</tr>
</tbody>
</table>

3. As a result of both the pressure and leakage testing and the pipeline flushing operations as per Sections 204.03, the pipeline at this point should be filled with potable water with a free chlorine residual of less than 0.5 mg/L.

The chlorination of the pipeline will proceed by filling the pipeline with the heavily chlorinated water at one end while the low chlorine residual (<0.5 mg/l) potable water is expelled at the other end of the pipeline. During the chlorinating process, (a) the potable water being expelled from the pipeline will be monitored for levels of free chlorine and total chlorine residual at 15-minute intervals. When the free chlorine or total chlorine residual exceeds the levels present in the low chlorine residual potable water, the chlorination process is to cease, and (b) the disposal of the low chlorine residual potable water is to be in a manner that conforms to all local, State, and federal regulations.

4. During the application of chlorine, valves shall be positioned so that the strong chlorine solution in the main being treated will not flow into water mains in active service. Chlorine application shall not cease until entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24 hours, during which time shall all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end- of this 24-hour period, the treated water in all portions of the main shall have a residual of not less than 15 mg/l free chlorine.

5. Hypochlorite solution may be applied to the water main with a gasoline or electrically powered chemical feed pump designed for feeding chlorine solutions. Feed lines shall be of such material and strength as to withstand safely the corrosion caused by the concentrated chlorine solutions and the maximum pressure that may be created by the pumps. All connections shall be checked for tightness before the solution is applied to the main.

6. As the chlorinated water flows past fittings and valves, related valves and blow-offs shall be operated so as to disinfect appurtenances and pipe branches.

DISPOSAL OF HEAVILY CHLORINATED WATER
ROWAN COLLEGE AT GLOUCESTER COUNTY
MEDICINE AND WORKFORCE DEVELOPMENT CENTERS

After the applicable retention period, heavily chlorinated water should not remain in contact with pipe for more than 48 hours. In order to prevent damage to the pipe lining or corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the system or is acceptable for domestic use.

Heavily chlorinated water (greater than 0.5 g/L residual) must be disposed of in a manner which conforms to all local, State and federal regulations.

The OWNER, Deptford Township Municipal Utilities Authority, hereby prohibits the discharge of heavily chlorinated water into the sanitary sewer collection system.

CONTRACTOR shall direct the heavily chlorinated water to a storm sewer system, in such a manner that the chlorine residual of water being disposed shall be neutralized by treating with one of the reducing agents listed in Table 2. The amount of reducing agent applied shall be sufficient to lower the chlorine residual of the water disposed to 0.0 mg/L.

TABLE 2
Pounds of chemicals to neutralize various residual chlorine concentrations in 100,000 gallons of water.

<table>
<thead>
<tr>
<th>Residual Chlorine Concentration (mg/L)</th>
<th>Sulfur Dioxide (SO₂)</th>
<th>Sodium Bisulfate (NaHSO₄)</th>
<th>Sodium Sulfite (Na₂(SO₃)₂)</th>
<th>Sodium Thiosulfate (Na₂S₂O₃·5H₂O)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.8</td>
<td>1.2</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>1.7</td>
<td>2.5</td>
<td>2.9</td>
<td>2.4</td>
</tr>
<tr>
<td>10</td>
<td>8.3</td>
<td>12.5</td>
<td>14.6</td>
<td>12.0</td>
</tr>
<tr>
<td>50</td>
<td>41.7</td>
<td>62.6</td>
<td>73.0</td>
<td>60.0</td>
</tr>
</tbody>
</table>

The proposed disposal site shall be approved by the ENGINEER.

BACTERIOLOGICAL TESTING

After final flushing and before the water main is placed in service, samples will be collected from points along the line by the CONTRACTOR and tested by the CONTRACTOR for bacteriological quality in accordance with Standard Methods for the Examination of Water and Wastewater. At least one sample will be collected from the new main at fire hydrants, blow-offs and at line valves.

Bacteriological tests must show complete absence of coliforms. If tests show presence of coliform, CONTRACTOR will required to perform additional flushing and disinfection of the pipeline until such time acceptable tests to be obtained, all at no cost to the OWNER. The CONTRACTOR will not be charged for the additional testing performed by the OWNER.

205.03 PRESSURE AND LEAKAGE TESTS

PART 1 - GENERAL

SCOPE OF WORK

The CONTRACTOR shall test all piping, valves and appurtenances installed under these Contract Documents. Testing shall be performed concurrent with installation. Unless otherwise approved by the ENGINEER no more than 1000 feet of pipe shall be installed without being tested. All tests must be witnessed by the OWNER and ENGINEER.

SUBMITTALS
ROWAN COLLEGE AT GLOUCESTER COUNTY
MEDICINE AND WORKFORCE DEVELOPMENT CENTERS

The CONTRACTOR shall prepare and submit to the ENGINEER schedules and procedures for testing of all parts of the water main installed in accordance with these Contract Documents. The schedule shall be submitted seven days prior to any testing.

PART 2 - PRODUCTS

EQUIPMENT

The pump, pipe connections, and all necessary apparatus for the pressure and leakage tests, gauges and metering devices, shall be furnished by the CONTRACTOR. The CONTRACTOR shall make all excavations and backfills, and furnish all necessary assistance for conducting the tests.

PART 3 - EXECUTION

GENERAL

When a reach of pipe deemed adequate by the OWNER is ready for testing, the pipeline shall be pressure and leak tested. The pressure and leak test shall be in accordance with AWWA Standard C600-10, latest revision, except as described herein. The CONTRACTOR shall develop a plan for successfully testing the pipeline and the exact means of testing is the CONTRACTOR's responsibility. The CONTRACTOR's plan shall be in accordance with the Specifications and shall be approved by the OWNER and the ENGINEER.

The CONTRACTOR may, at his option, completely backfill the trench or partially backfill the trench over the center portion of each pipe section to be tested. The ENGINEER may however direct the CONTRACTOR to completely backfill the trench if local traffic or safety conditions require such action.

The test pressure for all pipe shall be 150 psig ±5 psig and the total test duration shall be 2 hours.

FILLING AND TESTING

Each segregated section of pipeline will be slowly filled with water insuring that all air is expelled. Extreme care must be taken to insure all air is expelled from the pipeline during the filling of pipe with water. The line shall stand full of water for twenty-four hours prior to testing to allow ad air to escape. If necessary, tap the main at points of highest elevation so that air can be expelled as the pipe is filled with water. After successful completion of air expulsion, but prior to testing, the corporation stops shall be removed and the taps tightly plugged.

At the start of the test, the pipeline shall be gradually pressurized to 100 psig and held there for 20 minutes. The OWNER and the CONTRACTOR shall record pipeline pressure and water flow into the pipeline at 5 minute intervals. If the pressure is maintained at 100 psig ±5 psig and the leakage is within the allowable limits of AWWA Standard C600-10, the pipeline pressure shall be gradually increased to 150 psig ±5 psig and held there for 120 minutes. The OWNER and the CONTRACTOR shall record pipeline pressure and water flow into the pipeline at 10 minute intervals. All water supplied into the main during the test to maintain pressure within 5 psi of test pressure, and to bring pressure back to test pressure at the end of the test, shall be measured. This total amount of water is the leakage during the test. During the entire test period, the OWNER and the CONTRACTOR shall continuously observe the exposed end of the pipe for signs of movement or other indications of physical stress.

No pipeline installation will be accepted by the ENGINEER if the leakage is greater than that shown in the following table:

Table 1

<table>
<thead>
<tr>
<th>Nominal Pipe Diameter (Inches)</th>
<th>Avg.</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure (p.s.i.)</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>100</td>
<td>0.30</td>
<td>0.45</td>
</tr>
<tr>
<td>125</td>
<td>0.34</td>
<td>0.50</td>
</tr>
<tr>
<td>150</td>
<td>0.37</td>
<td>0.55</td>
</tr>
<tr>
<td>175</td>
<td>0.40</td>
<td>0.59</td>
</tr>
<tr>
<td>200</td>
<td>0.43</td>
<td>0.64</td>
</tr>
<tr>
<td>220</td>
<td>0.45</td>
<td>0.67</td>
</tr>
<tr>
<td>250</td>
<td>0.47</td>
<td>0.71</td>
</tr>
<tr>
<td>275</td>
<td>0.50</td>
<td>0.75</td>
</tr>
<tr>
<td>300</td>
<td>0.52</td>
<td>0.78</td>
</tr>
<tr>
<td>350</td>
<td>0.56</td>
<td>0.84</td>
</tr>
<tr>
<td>400</td>
<td>0.60</td>
<td>0.90</td>
</tr>
<tr>
<td>450</td>
<td>0.64</td>
<td>0.95</td>
</tr>
</tbody>
</table>

*If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.

The table has been generated from the formula:

\[ L = \frac{(SD(P)(1/2))}{133,200} \]

where \( L \) is the allowable leakage in gallons per hour, \( S \) equals the length of pipe in feet, \( D \) is the nominal pipe diameter in inches and \( P \) is the test pressure in PSIG.

Should any test disclose damaged or defective materials or leakage greater than that permitted, the CONTRACTOR shall at his own expense, locate and repair and/or replace defective materials. The tests shall be repeated until the leakage is within the permitted allowance and is satisfactory to the ENGINEER.

**REQUIREMENTS AFTER TESTING**

After successful completion of the leakage tests, the pipeline shall be depressurized and the test equipment shall be disconnected. The pipeline shall then be flushed in accordance with the recommendation of "Standard for Disinfecting Water Mains", (AWWA C651-14) of the American Water Works Association, except as may be modified herein. Flushing operations may, at the direction of the OWNER, need to be scheduled during off-peak demand periods, including nights, at no additional cost.

**205.04 DUCTILE IRON PIPE AND FITTINGS**

**PART 1 - GENERAL**

**WORK INCLUDED**

This Section includes all ductile iron pipe and fittings for water main extensions, and site piping.

**COORDINATION OF WORK**

Connection to existing pipelines may require shutdown of OWNER facilities. Construction work and connections shall be closely coordinated with the OWNER through the ENGINEER. The ENGINEER, in consultation with the OWNER, may select the time, including Saturdays, Sundays, or holidays, which, in the opinion of the ENGINEER, will cause the least inconvenience to the OWNER and/or its customers, for connection to existing pipelines, and the CONTRACTOR will perform such connections at such times as may be directed by the ENGINEER at the Contract prices and no claim for premium time or additional costs will be made by the CONTRACTOR.

**RELATED WORK**

205-9

4/1/2019  Section 205
Piping - General Provisions - Section 204.01

SUBMITTALS

Shop drawings and manufactures literature for all CONTRACTOR supplied materials shall be promptly submitted to the ENGINEER for approval.

The following items shall be submitted before delivery of ductile iron pipe or fittings:

1. Certification by the manufacturer or supplier that the pipe furnished for this project meets all pertinent AWWA Standards.

2. Laying schedule for boltless restrained joint and push-on joint pipe.

PIPE SUPPLIER

Ductile iron pipe and fittings shall be as manufactured by Griffin, or approved equal.

PART 2 - PRODUCTS

Research has documented that certain pipe materials (such as polyvinyl chloride, polyethylene, and polybutylene) and certain elastomers (such as those used in gasket material) may be subject to permeation by lower-molecular weight organic solvents or petroleum products. Products supplied under this section have been selected based on the non-expectation of encountering petroleum products or organic solvents. If during the course of pipeline installation the CONTRACTOR identifies, or suspects, the presence of petroleum products or any unknown chemical substance the ENGINEER is to be notified immediately. Installation of any further pipe and/or appurtenances in the area of suspected contamination shall be stopped until direction is provided by the ENGINEER.

PIPE MATERIAL

A. General:

Ductile iron pipe shall conform to the latest specifications as adopted by the American National Standards Institute, Inc., (ANSI) and the American Water Works Association (AWWA). Specifically, ductile iron pipe shall conform to ANSI A21.51/AWWA C151-09.

The pipe shall be coated outside with a bituminous coating in accordance with ANSI/AWWA C151-09/A21.51. The pipe interior shall be cement mortar lined and seal coated in compliance with the latest revision of ANSI A21.4/AWWA C104-13. The cement mortar lining shall be double thickness.

B. Pipe Class

The class of pipe to be furnished shall be thickness Class 52 with Class 350 fittings. Where indicated on the Drawings or in the Specification Special Conditions thicker classes shall be furnished.

C. Testing

Each length of pipe shall be subjected to a hydrostatic proof test as required by ANSI A21.51/AWWA C151-09.

D. Joints

1. Mechanical and Push-On

   Mechanical and push-on joints including accessories shall conform to ANSI/AWWA C111/A21.11-17.
2. Flanged

Flanged joints shall conform to ANSI/AWWA C110-12/A21.10 or ANSI B 16.1 for fittings and ANSI/AWWA C115-11/A21.15 for pipe. Flanged joints shall not be used in underground installations except within structures or where shown on the Drawings.

All flanged joints shall be furnished with 1/8-inch thick, red rubber or styrene butadiene fun face rubber gaskets. The bolts shall have America Standard heavy unfinished hexagonal head and nut dimensions all as specified in America Standard for Wrench Head Bolts and Nuts and Wrench Openings (ANSI B 18.2). For bolts of 1-3/4 inches in diameter and larger, bolt studs with a nut on each end are recommended. Material for flange bolts and nuts within structures shall conform to ASTM A575-96(2002).

Material for flange bolts and nuts which will be buried shall be ASTM A304-05(2011) stainless steel Grade B, with a minimum yield strength of 35,000 psi. Stainless steel bolts shall be furnished with grade stamp and markings.

3. Boltless Restrained Joint Pipe 8-Inch Diameter and Larger

Restrained joint pipe shall be of the boltless push-on-type which provides joint restraint independent of the joint seal. Boltless restrained joints shall be Griffin "Snap Lok", or equal.

VALVE BOXES

All valves shall be provided with valve boxes. Valve boxes shall be of the standard, adjustable, cast iron extension type, three piece, 5-1/4-inch shaft, screw type, and of such length as necessary to extend valve to finished grade. The valve box shall be hot coated inside and out with coal tar or asphaltic compound.

Valve boxes shall be manufactured by one of the following approved manufacturers:

Bingham & Taylor, Mueller, Handley Industries, A.Y. McDonald, Quality Water Products, Clay and Bailey, or approved equal.

Valve box bases shall conform to the following:

<table>
<thead>
<tr>
<th>Valve Size</th>
<th>Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; and smaller</td>
<td>round, 8&quot; in height, 10-7/8&quot; diameter at bottom</td>
</tr>
<tr>
<td>6&quot; and 8&quot;</td>
<td>round, 11&quot; in height, 14-3/8&quot; diameter at bottom</td>
</tr>
<tr>
<td>10&quot; and larger</td>
<td>oval, 11&quot; in height, 15&quot; x 11-1/8&quot; diameter at bottom</td>
</tr>
</tbody>
</table>

RODS, BOLTS, LUGS, AND BRACKETS

All steel rods, bolts, lugs and brackets shall be ASTM A36/A36M-14 or A307-14e1 carbon steel as a minimum requirement. After field installation all steel surfaces shall have one coat of Koppers #50 coal tar coating applied before backfill.

PART 3 - EXECUTION

See pipe installation specifications for general installation.

Piping shall be encased in polyethylene to prevent contact with surrounding backfill and bedding material in areas shown or designated by the ENGINEER. Polyethylene material shall be installed in accordance with ANSI/AWWA C105/A21.5-88 Standards.
Service taps for polyethylene encased pipe shall follow the procedure described in AWWA Standard C600-10 Section 7.1. Valve boxes shall be supported so that no load can be transmitted from the valve box to the valve. See sketch at the end of this Section. Tops shall be set at established grade. Valves shall be set at the required locations with joints centered, spigots home and valve stems plumb unless otherwise directed by the OWNER.

Tapping sleeve and valve assemblies require pressure testing prior to making the tap.

205.05 BURIED GATE VALVES

PART 1 - GENERAL

This Section covers all resilient seat gate valves 3-inches and larger on buried water mains and site piping.

PART 2 – PRODUCTS

Shop drawings and manufacturer's literature shall be submitted to the ENGINEER for approval for all gate valves to be furnished by the CONTRACTOR.

PART 3 - EXECUTION

Gate valves shall be installed as required by the NJDOT Standard Specifications, 2007 unless otherwise directed on the plans.

END OF SECTION
ROWAN COLLEGE AT GLOUCESTER COUNTY
MEDICINE AND WORKFORCE DEVELOPMENT CENTERS

SECTION 206 – STORM DRAINAGE

PART 1 - GENERAL

A. The Contractor shall furnish all material, equipment, labor, and all else necessary and incidental for the construction of two (2) drainage basins, installation of drainage pipes and structures within the line of construction at those locations as shown on the contract drawings, as specified herein or as directed by the Engineer.

B. All work shall be performed in accordance with the NJDOT Standard Specifications, 2007, the site plans, and the Gloucester County Soil Conservation District Requirements.

C. Basin construction and maintenance shall be performed in accordance with the NJDEP Best Management Practices Manual.

D. Pipe shall be handled carefully in order to prevent damage and denting. All pipe shall be lifted off of the delivery vehicle in order to avoid damage while unloading. Pipe shall not be dragged off the vehicle. Pipe shall be stored in an area where it will not be damaged during construction operations. When pipe is stacked, it shall be properly blocked or strapped. Pipe that is damaged will be rejected by the Engineer and will not be used on the project.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Reinforced Concrete Pipe (RCP) shall conform to the NJDOT 2007 Specifications Section 909.02.01 and AASHTO M170, Class III, Wall B.

B. All inlets shall be precast concrete and conform to NJDOT 2007 Standard Specifications. Welded steel wire fabric must be used as reinforcement for the structures.

C. All headwalls shall be precast concrete and conform to NJDOT 2007 Standard Specifications. Welded steel wire fabric must be used as reinforcement for the structures.

D. Bedding/Backfill: Shall conform to section 202.

PART 3 - EXECUTION

3.1 PREPARATION

A. The general method of construction shall proceed from the downstream rip-rap and continue upstream with the basin being constructed and stabilized prior to construction of the upstream pipes and the building. The basin must function as a sediment control basin with the outlet covered during construction.

B. Order inlets and manholes with due regard to the required underclearance between the pipe invert and bottom of structure. Ensure that pipe penetrations are mortared and sealed both inside and outside the structure prior to proceeding with backfill around the structure.

C. Layout pipe and structures with care to ensure no sags or abrupt angled joints or penetrations at structures.

D. Submit shop drawings for all drainage structures, all of which shall be precast concrete. No cast in place or concrete block drainage structures will be permitted.

206-1
3.2A. STORM DRAIN INSTALLATION:

1. The laying of new pipe shall begin at the downstream end of the pipe line. The lower segment of the pipe shall be in firm contact with the bedding throughout its full length. Bell or groove ends of pipe shall be placed facing upstream.

2. Where the ends of pipes are to enter concrete masonry walls, the pipe shall be neatly cut to fit the inside face of the wall with the specified projection and the pipe shall be grouted in place both inside and outside.

3. Pipe will be inspected before backfill is placed. Any pipe found to be out of alignment, excessively settled, or damaged shall be taken up and re-laid or replaced.

4. After grouting, cover all joints, including penetrations at structures with geotextile filter fabric.

5. Backfill under the pipe adjacent to structures with concrete, rodded gravel or flowable fill. Extreme care shall be taken to ensure complete filling of the void without movement of the pipe, grout, or geotextile.

B. JOINING PIPE:

1. Joints for rigid pipe shall be made with mortar, grout or gaskets. Other types of joints recommended by the pipe manufacturer may be permitted.

2. Gaskets shall be installed to form a flexible watertight seal. Rubber and flexible plastic gaskets shall be installed in accordance with recommendations of the manufacturer.

3. For mortar joints, the pipe ends shall be cleaned and wetted with water before the joint is made. Stiff mortar shall be placed in the lower half of the bell or groove of the pipe section already laid and on the upper half of the spigot or tongue of the section to be laid. The two pipe sections shall then be tightly joined with their inner surfaces flush and even. Any voids occurring in the outside of the joint shall be filled. Lifting holes shall be filled with stiff mortar.

4. After grouting or joining with gaskets, pipes joints shall be wrapped with geotextile filter fabric.

C. INSTALLATION – OUTLET STRUCTURE AND CLEANOUTS

1. Form bottom of excavation clean and smooth to correct elevation.

2. Form and place Cast-In-Place Concrete base pad, with provision for storm sewer pipe end sections.

3. Establish elevations and pipe inverts for inlets and outlets as indicated.

4. Mount type E casting and frame level in grout, secured to the top elevation indicated.

D. INSTALLATION – CONCRETE HEADWALLS AND INLETS

1. Form bottom of excavation clean and smooth to correct elevation.

2. Place the precast structures to the correct elevations and orientations.

3. Tie-in pipes to the structures and grout around the pipe in order to eliminate any soil or water from entering through the void space.
4. Type E casting and frames must be used for the inlet structures and have the words “No Dumping” along with the symbols embossed. The castings and frames must be level in grout and secured to the top elevation indicated.

E. PROTECTION

1. A steel plate shall be used to cover the orifice and weir to not allow sediment or other material to discharge to the existing system. The steel plate shall be removed when all other construction procedures are completed.

2. Protect pipe and aggregate cover from damage or displacement until backfilling operation is completed.

END OF SECTION
PART 1 - GENERAL

The Contractor shall furnish and install all conduits and junction boxes for a complete functional site lighting system. The spacing of the lights shall be as shown on the site plans.

Light poles, wiring, and connections between poles and junction boxes shall be done by Atlantic City Electric.

All work shall comply with AASHTO and NJDOT standards as well as the NEC Code.

PART 2 - PRODUCTS

All junction boxes, conduits and pull cords shall be as required by Atlantic City Electric.

PART 3 - EXECUTION

The Contractor is responsible for the COMPLETE installation of the light poles, light foundations, conduit, wiring, junction boxes, light meter, and the start up of the system.

Foundations and conduits shall be constructed in accordance with the drawings and NJDOT materials specifications.

Wiring shall be in accordance with the NEC.

All work shall be performed in accordance with the manufacturer’s specifications.

The layout of lights and electrical work is found on the Electrical Site Plan and the Landscaping, Utility, & Landscaping Plan.

Details of the electrical circuits, wiring and grounding shall conform the electrical drawings and specifications sections.

Poles and foundations shall be protected from damage during the work. Any chips, dents or breakage shall be corrected or replaced at the Owners discretion.

Provide manufacturers warranties on all components with an as-built drawing indicating poles and actual layout of conduits.

END OF SECTION
SECTION 208 PAVEMENTS

208.06 HOT MIX ASPHALT (HMA)

PART 1: GENERAL

1.01 DESCRIPTION

This work shall consist of the construction of base course and surface course of HMA; the treatment and/or sealing of joints and cracks in HMA surface course.

Any damage to the existing site work shall be restored by the Contractor to the satisfaction of the Owner at no cost to the Owner. All limits where new asphalt meets existing shall be saw cut and sealed in both the base course and the surface course. Raveling edges or cracks along saw cuts shall be recut, full width if directed, and new asphalt placed to the new saw cut and sealed edge.

PART 2: PRODUCTS

2.01 MATERIALS

HMA materials shall conform to NJDOT Standard Specifications Division 4 and Sections 901 and 902. The Contractor shall use Mix I-5 (12.5M64) for the 2" thick HMA surface course and Mix I-2 (19M64) for the 2" thick HMA base course.

Only pre-approved NJDOT mixes shall be used.

Other materials shall conform to the following Subsections of the NJDOT Standard Specifications, 2001:

- Tack Coat: ........................................................................................................................................... 902.01
- Joint Sealer, Hot-Poured............................................................................................................................... 914.02
- Backer Rod - ASTM D 5249, Type 1........................................................................................................ 914.02

Submittals

The contractor shall submit a clear copy of the NJDOT approval form showing the mix design and serial number for the specific HMA mixes to be used at least 30 days prior to use.

Each truck ticket shall show the approved serial number of the HMA mix.

2.02 EQUIPMENT

All equipment used shall conform to Section 401 of the N.J.D.O.T. Standard Specifications.

PART 3: EXECUTION

3.01 PREPARATION & CONSTRUCTION

The general method of construction shall conform to the ‘Construction’ portion of section 401 of the NJDOT Standard Specifications, 2007. The asphalt shall be constructed as shown on the Contract Drawings, or as directed by the Engineer.
3.02 WEATHER LIMITATIONS

Limitations shall be as specified in Section 401 of the N.J.D.O.T. Standard Specifications. In no case will paving on frozen or saturated surfaces be permitted. Paving shall not be permitted during rain or snow, or when precipitation is forecast for the work day. Paving shall not be permitted when the ambient temperature is, or is forecast to be below 40 degrees F. Following periods of low temperatures, the subgrade and/or base pavement temperature shall be checked and confirmed to be at or above 35 degrees F.

208.11 DENSE GRADED AGGREGATE BASE COURSE

PART 1: GENERAL

This work shall consist of constructing base courses of dense graded aggregate, with a minimum thickness of 6-inches. Recycled concrete or asphalt products may be used to construct a firm compacted sub-base prior to paving, provided they conform to the gradation requirements for Dense Graded Aggregate or Soil Aggregate 1-5.

Placement of a dense graded aggregate base course shall be at the discretion of the Engineer and thickness of base course shall be increased or decreased depending on the structural conditions in each section of roadway.

The material shall also be used by the Contractor to construct temporary access paths for construction and emergency vehicles. This material shall be kept on-site and readily available for use on a daily basis.

Materials, Placement, and Compaction of the DGA shall conform to the NJDOT Standard Specifications, 2007 as amended hereto.

Submittals

Submit copies of approval of the materials and sources by NJDOT. Approved moisture density curves for the material.

Construction

Prior to placement, compact the subgrade to 95% of maximum dry density as determined by ASTM D-1557. Proof rolling may at the discretion of the Construction Manager be used in lieu of compaction of all areas. Areas that are not suitable shall be compacted, or removed and replaced with compacted materials as directed.

Compact Dense Graded Aggregate layers to 95% of maximum dry density as determined by ASTM D-1557.

Maintain surface grades and slopes to ensure that water does not accumulate on or in the prepared subgrade or aggregate layer. Maintain surface grades and ditches along the work to prevent runoff from flowing from adjacent areas into the aggregate area.

Recompact and replace if directed and proof roll any areas disturbed prior to paving.

END OF SECTION
PART 1: GENERAL

This work consists of the installation of a variety of site items including but not limited to traffic control signs, handicap ramps with detectable warning surfaces, handicap parking painting & signage, traffic stripes, traffic markings, etc.

PART 2: PRODUCTS

Traffic control and parking signs shall be new on new posts and shall conform to the M.U.T.C.D., and N.J.D.O.T. standards.

Temporary traffic control signs need not be new, but shall be clean, free of damage and of proper reflectivity.

Traffic stripes shall be long life epoxy resin with glass beads conforming to the following:

Epoxy Resin. For long-life pavement striping, use an epoxy resin that is a 2 component, 100 percent solids formulation conforming to the following requirements:

1. Color. Ensure that the material conforms to the initial color requirements in ASTM D 6628.

2. Yellowness Index. When tested according to ASTM E 313 (with glass beads), ensure that the white epoxy resin exhibits a maximum 20.00 yellowness index after 72 hours of QUV exposure.

3. Directional Reflectance. Ensure that the epoxy resin compound (without glass beads) has a minimum directional reflectance, relative to a magnesium oxide standard, of 80 percent for white and 50 percent for yellow when tested according to ASTM E 1347.

4. Drying Time. Ensure that the epoxy resin compounds, when tested according to ASTM D 711, exhibit no pick-up after a 15 minute drying time.

5. Abrasion Resistance. When the epoxy resin material is tested according to ASTM C 501, with a CS-17 wheel under a load of 1000 grams for 1000 cycles, ensure that the abrasive wear index is no greater than 80. The abrasive wear index is the weight in milligrams that is abraded from the sample under the specified test conditions.

6. Hardness. After the epoxy resin material has cured between 72 and 96 hours at 70 °F, ensure that the Shore D hardness is between 75 and 100 when tested according to ASTM D 2240.

7. Resin shall conform to NJDOT table 912.03.01-1

8. Glass Beads shall conform to the following:

Small Glass Beads. Use small beads conforming to AASHTO M 247, Type 1, with a moisture resistant coating. Ensure that glass beads do not contain more than 200 ppm of lead, 200 ppm of antimony, or 200 ppm of arsenic.

9. Traffic markings shall be either preformed or hot extruded thermoplastic conforming to AASHTO M 249, except that for preformed thermoplastic, the minimum thickness requirement is 90 mils. Use beads conforming to AASHTO M 247, Type 1, with a moisture resistant coating. Ensure that glass beads do not contain more than 200 ppm of lead, 200 ppm of antimony, or 200 ppm of arsenic.
10. Handicap ramp detectable warning surfaces shall be precast brick or concrete inlaid in Class B concrete. Shape, orientation and color contrast shall conform to the 2010 guidelines for Americans with Disabilities Act.

11. For detectable warning surfaces, use a surface or a coating material that is safety red in color according to FED-STD-595B color chip No. 31350 and has a 35 BPN minimum slip resistance when tested according to ASTM E 303. Ensure that the finished product is stabilized against UV degradation and adheres to the substrate without peeling or blistering.

12. Submit shop drawings and/or materials certifications for each of the above mentioned items.

PART 3: EXECUTION

Layout all signs, markings and miscellaneous items prior to installation. Confirm layout with Construction manager prior to installation.

Install all signs plumb and facing/perpendicular to the intended direction of visibility. Immediately reset any signs that are found to be out of plumb, rotated, or damaged.

Ensure adequate clearances between bumpers and signs, and mounting heights and offsets will prevent pedestrian or vehicular contact with the signs or posts. Unless otherwise directed install signs with bottom edge 7 feet above adjacent pavement or walk surface.

Install handicap signs as shown in the details and 2’ 6” to 6’-0” from the parking bumper or curb as approved by the Construction Manager.

END OF SECTION
212.18 LANDSCAPING

PART 1: GENERAL

1.01 DESCRIPTION

The work of this section shall include furnishing, planting, and maintaining, shrubs, trees, lawns and ground covers throughout the work area and where necessary to restore disturbed landscape items.

The Contractor shall install trees, shrubbery, and fertilize and seed the disturbed lawn areas as required in the site plans.

The Contractor shall perform an in-depth site investigation prior to bidding in order to understand the proposed work and extent of coordination that will be required between the various trades and sequences of the work.

Any decorative stone surfaces and landscape edging materials disturbed during utility work shall be restored to its original condition as soon as possible and prior to final acceptance of the Project.

In general, all areas disturbed by construction activity and not to be paved shall be topsoiled and seeded, unless otherwise noted on the plan. Topsoil shall be placed uniformly to an average thickness of six inches (6"), firmed in place.

All work shall meet the requirements of the Gloucester Soil Conservation District and be in accordance with the "Standards for Soil Erosion and Sediment Control in New Jersey"; latest edition.

The CONTRACTOR shall restore and replace shrubbery, fencing, grass or sod or other disturbed surfaces or structures to conditions equal to that before the work began and to the satisfaction of the ENGINEER and the OWNER.

PART 2: PRODUCTS

2.01 TOPSOIL

Topsoil, 6" thick average, 4" thick, minimum, shall not contain more than 40 percent clay in that portion passing a No. 10 sieve and shall contain not less than 5 percent nor more than 20 percent organic matter as determined by loss on ignition of samples oven-dried to constant weight at 212° Fahrenheit.

Topsoil mixture to be used for backfilling planted areas shall consist of three (3) parts by volume of topsoil thoroughly mixed with one (1) part of peat moss or humus. Peat moss shall be Michigan Peat Moss or approved equal in color and consistency.

Existing topsoil may be used with appropriate maintenance and approved additives, modification and mixing only. If existing topsoil stock piles are not properly maintained and kept in viable healthy organic condition, the Construction manager may direct that they be removed and disposed of and replaced with certified topsoil at no additional cost to the owner.

2.02 FERTILIZER

Fertilizer shall be lawn or turf grade 10-20-20. The CONTRACTOR shall apply limestone and fertilizer in accordance with Soil Conservation District standards.

2.03 SEED

Seeding mixture used to stabilize transition areas and non-wetland areas shall consist of the following:
2.04 STRAW MULCH

Mulch for seeded areas shall be straw reasonably free of weed seed and any foreign materials that may affect plant growth. Other materials may be used if approved by the ENGINEER.

2.06 MULCH FOR PLANT MATERIAL

All trees and shrubs shall be mulched with shredded hardwood bark.

2.07 TREES AND SHRUBS

The Contractor shall furnish quantities necessary to complete the planting as shown and located on the plan. Plants shall have the habit of growth that is normal for the species and shall be sound, healthy, vigorous, and free from insects, plant diseases and injuries. Plants shall equal or exceed measurements specified in the plant list which are the minimum acceptable. Plants should be measured before pruning with branches in normal position; necessary pruning shall be done at time of planting. The Contractor shall at all times handle the trees and shrubs with the utmost care to prevent injuries to the branches or roots. The solidity of the root ball shall be carefully preserved.

Trees selected should well match as to height, spread and general conformation. Trees delivered with broken balls will be rejected.

Plant names used in the plant list shall conform to "Standardized Plant Names," second edition, 1942.

Plant materials shall conform to the Standard Specifications of the "American Association of Nurserymen, Inc."

2.09 LANDSCAPE FABRIC:

Landscape fabric shall be a spun-bound non-woven polyester fabric which will act as a weed barrier and shall permit passage of air and liquids. Landscape fabric shall be Mirascape as manufactured by Mirafi, Inc. or approved equal.

2.10 TOPSOIL STABILIZATION MATTING:

Topsoil stabilization matting shall be an Excelsior erosion matting, Model No. SC-150 or approved equal. The matting shall be installed as described in the manufacturer’s specifications and the final product is subject to the approval of the inspector and Owner.

PART 3: EXECUTION

3.01 PREPARATION OF SEED BED

A. Topsoil Areas

If suitable topsoil is available as part of the excavated material it shall be removed, stored, and used to backfill the top 4 inches of the excavation. All grass, weeds, roots, sticks, stones, and other debris are to be removed and the topsoil carefully brought to the finished grade by raking.
3.02 FERTILIZING

Fertilizer shall be uniformly applied to all areas to be seeded at the rate of 11 pounds per 1,000 square feet. The fertilizer shall be thoroughly disked, harrowed or raked into the soil to a depth of not less than 4 inches. Immediately before sowing the seed, the CONTRACTOR shall rework the surface until it is a fine, pulverized, smooth seed bed, varying not more than 1 inch in 10 feet.

3.03 SEEDING

Immediately after the preparation and fertilization of the seed bed, the seed shall be thoroughly mixed and then evenly sown over the prepared areas at the rate indicated in PART 2.03. Seed shall be sown dry or hydraulically. After sowing, the area shall be raked, dragged, or otherwise treated to cover the seed to a depth of approximately 1/4".

Areas with slopes greater than 10% shall be stabilized with stabilization matting or may be sodded.

3.04 MULCHING

Within 48 hours after any given area is seeded, mulching material shall be evenly placed over all seeded areas at the rate of approximately 2 tons per acre, when seeding is performed between the dates of March 15 and October 15 of the same year, and at the approximate rate of 3 tons per acre when seeding is performed between the dates of October 15 and March 15 of the succeeding year.

No seeded areas shall remain un-mulched longer than 48 hours. All mulch shall be left in place to disintegrate, except the CONTRACTOR shall remove excessive amounts of hay when so directed by the ENGINEER.

3.05 PLANTING OF TREES AND SHRUBS

The Contractor shall stake the location of each plant in accordance with the plans. The staking and layout work shall be done sufficiently in advance of planting operations to allow for the Owner's approval before start of digging operations.

Under no conditions will the Contractor be allowed to dig holes prior to approval of the location of the plant material. The location of plants, as shown on the drawings, is intended only as a guide.

The trees shall be planted in pits at least 2' greater in diameter than their ball of earth or spread of roots. The depth of the pits shall be at least as deep as it is necessary to accommodate the ball of the tree and to permit the required preparation if the bottom of the pit so that it will not be necessary to raise or lower the tree to bring it to the required grade. When the tree has been properly set, the pit shall be thoroughly watered during and after backfilling. Enough topsoil shall be used to bring the surface, when settled, to the required grade. The tree pit shall be ringed with earth at its edge to form a saucer of at least 3" depth.

All shrubs shall be planted in the planting beds previously prepared or, where freestanding, in individual pits. Individual shrub pits shall be at least 18" deep and at least one foot wider on each side than the ball of earth or spread of roots. All pits shall be circular in the outline and dug with vertical sides. After setting the shrub in the center of the pit, the pit shall be thoroughly settled by watering. The planting pit shall be ringed with earth at its edge to form a saucer at least 3" in depth. Mulch as specified.

Mulch shall have no leaves, young green growth, wood shavings, sawdust, or foreign materials of any nature mixed with the
bark.

To the planting medium used in the backfilling of tree pits and shrub beds, there shall be added, as the progress of the work permits, manure or peat moss, ground limestone if soil tests indicate it is needed, and commercial fertilizer at the rate of (3) pounds for trees up to 3" in caliper, one (1) pound per 1" caliper for larger trees, six (6) ounces for small shrubs and eight (8) ounces for each shrub 4" or over. Ground limestone, manure, and fertilizer shall be incorporated thoroughly with the topsoil in the planting operation, care being taken that the manure does not come into immediate contact with the roots.

Backfill shall be watered, 12" at a time. After backfilling is completed, mulch all plant material. All trees and shrubs shall be mulched with shredded hardwood bark immediately after planting and finished topsoil grading. Trees and shrubs shall have a mulching of 3" mulch spread uniformly to cover the entire area of planting and/or beds.

Guying and wrapping shall be as indicated on the drawings. Trees shall be guyed immediately after planting. Pieces of rubber hose shall be used under the wires where they are attached to the tree.

Wire for tree guys shall be pliable #15 gauge galvanized annealed steel wire, twisted. Turnbuckles shall be galvanized and have 1/2" lengthwise openings, threaded ends 5/16" diameter, fitted with screw eyes. Hose shall be new black two-ply, reinforced fiber-bearing garden hose not less than 1/2" inside diameter. Wrapping for tree trunks shall be of burlap first quality, at least eight ounces in weight, spirally wound to the second branch with a 50% overlap. Deadmen shall be at least 8" diameter by 3' long of crested wood, for trees over 3" caliper. Stakes for guying trees shall be 2" x 3" x 48", one end pointed.

Adequate protection shall be provided at all time for planted areas against trespassing by any individuals, and damage of any kind. Such protection shall be maintained to the completion of the contract work.

Maintenance of planting until acceptance - The areas around trees, shrubs and ground cover shall be kept cultivated, free of weeds and grass, and properly watered until acceptance, pruning shall be done as soon as dead branches appear. If any tree settles more than 3" below the established grade, it shall be raised to the proper level and not merely filled in with additional topsoil.

Winter Protection - The Contractor shall spray all needle evergreens with two (2) applications of antidesiccant, Dowex or approved equal. First application by the second week in November and second in February when temperature is above 40 degrees.

The Contractor shall proceed with and complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.

The Contractor shall determine the location of underground utilities and perform work in a manner which will avoid possible damage, including hand excavation as required. The Contractor shall maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

The Contractor shall plant trees and shrubs after final grades are established and prior to planting of lawns. If planting of trees and shrubs occurs after lawn work, the Contractor shall protect lawn areas and promptly repair damage to lawns resulting from planting operations.

The Contractor shall guarantee all plant material installed under this Contract for a period of one (1) year after the Owner's final acceptance of all planting and at no additional cost to the Owner.

The Contractor shall replace any trees, shrubs or vines that are dead or that are, in the opinion of the Owner, unhealthy or unsightly or that have lost their design value or natural shape because of dead branches, excessive pruning, or inadequate or improper maintenance.

All the abovementioned material will be removed immediately upon direction of the Owner and replacement planting is to be done no later than the succeeding season.
3.06 TREE REPLACEMENT

Where trees are removed during construction they shall be replanted with species acceptable to the Owner if and where shown on the plans.

3.07 MAINTENANCE

All seeded and sodded areas shall be carefully maintained, tended and watered by the CONTRACTOR as necessary to secure a good turf. Settled areas shall be filled, graded and reseeded or re-sodded. The CONTRACTOR shall be responsible for the condition of the seeded and sodded areas for a period of one year from the date of final completion.

During landscape work, the Contractor is to store all materials and equipment in secure and weather-protected areas. He is to keep all pavement cleaned and work areas in an orderly condition.

The Contractor is to protect all landscape work and materials from loss, damage, and deterioration during storage, installation, and maintenance periods. He is to protect them from all unauthorized persons as well as from operations by other subcontractors and tradesmen.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.

B. Related Sections include the following:

1. Division 2 Section "Earthwork" for drainage fill under slabs-on-grade.
2. Division 2 Section "Concrete Sidewalk" for concrete pavement and walks.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Do not start concrete production until data has been reviewed and approved by the engineer.

C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

D. Welding Certificates: Copies of certificates for welding procedures and personnel.

E. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

F. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Cementitious materials and aggregates.
2. Form materials and form-release agents.
3. Steel reinforcement and reinforcement accessories.
4. Admixtures.
5. Curing materials.
6. Floor and slab treatments.
7. Vapor retarders.
8. Epoxy joint filler.
11. Form liners
12. Reglets.
13. Vapor retarder/barrier

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for formwork and shoring and reshoring installations that are similar to those indicated for this Project in material, design, and extent.

C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.

D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548. Contractor shall provide a storage box for concrete cylinders.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

F. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

G. ACI Publications: Comply with the following, unless more stringent provisions are indicated:

1. ACI 301, "Specification for Structural Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials." CRSI
SECTION 03300 - CAST-IN-PLACE CONCRETE

H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1. Before submitting design mixes, review concrete mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

   a. Contractor's superintendent.
   b. Independent testing agency responsible for concrete design mixes.
   c. Ready-mix concrete producer.
   d. Concrete subcontractor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

   1. Plywood, metal, or other approved panel materials.
   2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

      a. High-density overlay, Class 1, or better.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.


D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

   1. Furnish units that will leave no corrodbile metal closer than 1 inch (25 mm) to the plane of the exposed concrete surface.
   2. Furnish ties that, when removed, will leave holes not larger than 1 inch (25 mm) in diameter in concrete surface.
   3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.
2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.

B. Joint Dowel Bars: Plain-steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

C. All hooks, unless otherwise noted, shall conform to “ACI Standard Hooks”.

D. Tie-wire shall not be less than 16 gauge wire

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I/II.

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:

C. Fly Ash: ASTM C618, Type F

D. Water: Potable and complying with ASTM C 94.

2.5 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.


C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
2.6 VAPOR BARRIER SYSTEM

A. Vapor Barrier System: ASTM E 1745, Class A, polyolefin sheet, not less than 10 mil.

B. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 sieve and 10 to 30 percent passing a No. 100 sieve; meeting deleterious substance limits of ASTM C 33 for fine aggregates.

C. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

2.7 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

G. Products: Subject to compliance with requirements, provide one of the following or approved equal:

1. Evaporation Retarder:
   a. Sure Film; Dayton Superior Corporation.
   b. Eucobar; Euclid Chemical Co.
   c. E-Con; L&M Construction Chemicals, Inc.
   d. Confilm; Master Builders, Inc.
   e. Waterhold; Metalcrete Industries.
   f. Rich Film; Richmond Screw Anchor Co.
   g. SikaFilm; Sika Corporation.
   h. Finishing Aid; Symons Corporation.
   i. Or approved equal

2. Clear, Solvent-Borne, Membrane-Forming Curing Compound:
   a. Nitocure S; Fosroc.
   b. Cure & Seal 309; Kaufman Products Inc.
c. L&M Dress & Seal 18; L&M Construction Chemicals, Inc.
d. CS-309; W. R. Meadows, Inc.
e. Seal N Kure; Metalarcrete Industries.
f. Rich Seal 14 percent UV; Richmond Screw Anchor Co.
g. Kure-N-Seal; Sonneborn, Div. of ChemRex, Inc.
h. Clear Seal 150; Tamms Industries Co., Div. of LaPorte Construction Chemicals of
North America, Inc.
i. Or approved equal

3. Clear, Waterborne, Membrane-Forming Curing Compound:

a. Safe Cure and Seal; Dayton Superior Corporation.
b. Aqua Cure VOX; Euclid Chemical Co.
c. Dress & Seal WB; L&M Construction Chemicals, Inc.
d. Vocomp-20; W. R. Meadows, Inc.
e. Metpure; Metalarcrete Industries.
f. Cure & Seal 150E; Nox-Crete Products Group, Kinsman Corporation.
g. Cure & Seal 14 percent E; Symons Corporation.
h. Seal Cure WB 150; Tamms Industries Co., Div. of LaPorte Construction
Chemicals of North America, Inc.
i. Or approved equal

2.8 RELATED MATERIALS


B. Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Shore A
hardness of 80 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059, Type II, non-dispersible, acrylic emulsion or styrene
butadiene.

D. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing
and bonding to damp surfaces, of class and grade to suit requirements, and as follows:

1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.
2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to
hardened concrete.
3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to
hardened concrete.

E. Reglets: Fabricate reglets of not less than 0.0217-inch- thick galvanized steel sheet.
Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

F. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch thick, with
bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of
concrete or debris.

2.9 REPAIR MATERIALS
SECTION 03300 - CAST-IN-PLACE CONCRETE

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5700 psi at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.

C. Footings and Foundation Walls: Proportion normal-weight concrete mix as follows:

2. Maximum Slump: 3 inches.
3. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8 inches after admixture is added to concrete with site-verified 2- to 3-inch slump.

D. Slab-on-Grade: Proportion normal-weight concrete mix as follows:


E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
F. Maximum Water-Cementitious Materials Ratio: 0.40 for concrete required to have low water permeability. This includes elevator pits and basement walls.

G. Maximum Water-Cementitious Materials Ratio: 0.40 for concrete exposed to deicers or subject to freezing and thawing while moist. This includes exterior slabs and walls.

H. Maximum Water-Cementitious Materials Ratio: 0.40 for corrosion protection of steel reinforcement in concrete exposed to chlorides from deicing chemicals, salt, saltwater, brackish water, seawater, or spray from these sources.

I. Maximum Water-Cementitious Materials Ratio: 0.40 for all interior slabs.

J. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:

1. Air Content: 5.5 percent for 1-1/2-inch nominal maximum aggregate size.
2. Air Content: 6 percent for 1-inch nominal maximum aggregate size.
3. Air Content: 6 percent for 3/4-inch nominal maximum aggregate size.

K. Do not air entrain concrete to trowel-finished interior floors and suspended slabs. Do not allow entrapped air content to exceed 3 percent.

L. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

M. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixes where indicated.

2.11 FABRICATING REINFORCEMENT

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

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
SECTION 03300 - CAST-IN-PLACE CONCRETE

B. Project-Site Mixing: Only when specifically approved by the Architect. Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least one and one-half minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
   1. Class A, 1/8 inch for surfaces exposed to view.
   2. Class C, 1/2 inch all other surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
   1. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Do not chamfer corners or edges of concrete.
SECTION 03300 - CAST-IN-PLACE CONCRETE

J. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

K. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

L. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

M. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor bolts, accurately located, to elevations required.
2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.

B. Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports weight of concrete in place until concrete has achieved the following:

1. At least 70 percent of 28-day design compressive strength.

C. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

D. When forms are reused, clean surfaces, remove fins and laittance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 SHORES AND RESHORES
SECTION 03300 - CAST-IN-PLACE CONCRETE

A. Comply with ACI 318, ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.

B. In multistory construction, extend shoring or reshoring 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 reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR BARRIER SYSTEM

A. Vapor Barrier System: Place, protect, and repair vapor-barrier sheets according to ASTM E 1643 and manufacturer's written instructions. Lap joints 6 inches minimum and seal with manufacturer's tape.

3.6 STEEL REINFORCEMENT

A. General: Comply with CRST's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 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 from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in 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. 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.

7. Use epoxy-bonding adhesive 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. Construct contraction joints for a depth equal to at least one-third of concrete thickness, 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. 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 wide joints into concrete as soon as possible when cutting action will not dislodge aggregate or otherwise damage surface usually 1 to 2 hours depending on mix design, environmental conditions, etc. and before concrete develops random contraction cracks, typically 1 to 2 hours depending on mix design, environmental conditions, etc.

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 or more than 1 inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.

1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
B. Do not add water to concrete during delivery, at Project site, or during placement, unless approved by Architect.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation. Limit Free-Fall to a height of five (5) feet.

D. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Screeb slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
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G. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
2. Do not apply rubbed finish to smooth-formed finish.

C. Rubbed Finish: Apply the following to smooth-formed finished concrete:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part portland cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.
SECTION 03300 - CAST-IN-PLACE CONCRETE

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes.

1. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

D. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system

2. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for a randomly trafficked floor surface:

   a. For thin-set flooring or resilient floor covering: 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.

   b. For carpet floors: Specified overall values of flatness, F(F) 25; and levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and levelness, F(L) 15.

E. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

B. Curbs: Provide monolithic finish to interior curbs where indicated by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.12 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
   b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer’s written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid epoxy joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spills, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.
A. Testing Agency: Owner will engage and pay for a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.

5. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.

6. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.

7. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.

   a. Cast and field cure one set of four standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C 39; test two laboratory-cured specimens at 7 days and two at 28 days.

   a. Test two field-cured specimens at 7 days and two at 28 days.

   b. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

D. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
SECTION 03300 - CAST-IN-PLACE CONCRETE

E. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.

F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

END OF SECTION 03300
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following when indicated:

   1. Concrete masonry units.
   2. Building (common) brick.
   3. Mortar and grout.
   4. Reinforcing steel.
   5. Masonry joint reinforcement.
   6. Ties and anchors.
   7. Embedded flashing.
   8. Miscellaneous masonry accessories.

B. Products furnished, but not installed, under this Section include the following:

   1. Dovetail slots for masonry anchors, installed under Division 3 Section "Cast-in-Place Concrete."
   2. Anchor sections of adjustable masonry anchors for connecting to structural frame, installed under Division 5 Section "Structural Steel."

C. Products installed, but not furnished, under this Section include the following:

   1. Steel lintels and shelf angles for unit masonry, furnished under Division 5 Section "Metal Fabrications."
   2. Manufactured reglets in masonry joints for metal flashing, furnished under Division 7 Section "Sheet Metal Flashing and Trim."
   3. Hollow-metal frames in unit masonry openings, furnished under Division 8 Section "Steel Doors and Frames."

D. Related Requirements:

   1. Section “Fluid-Applied Membrane Air Barriers” for flexible through wall flashings.

1.3 DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS

A. Product Data: For each different masonry unit, accessory, and other manufactured product specified.

UNIT MASONRY ASSEMBLIES
SECTION 04810 - UNIT MASONRY ASSEMBLIES

B. Shop Drawings: Show fabrication and installation details for the following:

1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.
2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection: For the following:

1. Unit masonry Samples in full-scale form showing the full range of colors and textures.
2. Colored mortar Samples showing the full range of colors.

D. Samples for Verification: For the following:

1. Full-size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
2. Colored mortar Samples for each color required, showing the full range of colors expected in the finished construction. Make samples using the same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used.
3. Stone trim samples not less than 12 inches in length, showing the full range of colors and textures expected in the finished construction.
4. Weep holes/vents in color to match mortar color.
5. Accessories embedded in the masonry.

E. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents, unless such deviations are specifically brought to the attention of the Architect and approved in writing.

F. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

G. Material Test Reports: From a qualified testing agency indicating and interpreting test results of the following for compliance with requirements indicated:

1. Each type of masonry unit required.
   a. Include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.
   b. Include test results, measurements, and calculations establishing net-area compressive strength of masonry units.

2. Mortar complying with property requirements of ASTM C 270
3. Grout mixes complying with compressive strength requirements of ASTM C 476. Include description of type and proportions of grout ingredients.

H. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

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SECTION 04810 - UNIT MASONRY ASSEMBLIES

1. Each type of masonry unit required.
   a. Include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.
   b. Include test data, measurements, and calculations establishing net-area compressive strength of masonry units.

2. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.

3. Each combination of masonry unit type and mortar type. Include statement of net-area compressive strength of masonry units, mortar type, and net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

4. Each material and grade indicated for reinforcing bars.

5. Each type and size of joint reinforcement.

6. Each type and size of anchor, tie, and metal accessory.

I. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated, as documented according to ASTM E 548.

B. Contractor shall employ and pay a qualified professional engineer to provide a survey and inspection of foundations for compliance with dimensional tolerances.

C. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

D. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

E. Preconstruction Testing Service: The Contractor shall employ and pay for a qualified independent testing agency to perform the following preconstruction testing:
   1. Concrete Masonry Unit Test: For each concrete masonry unit indicated, per ASTM C 140.
   2. Prism Test: For each type of wall construction indicated, per ASTM C 1314.
   3. Mortar Test: For mortar properties per ASTM C 270.

F. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
G. Mockups: Before installing unit masonry, build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work:

1. Locate mockups in the locations indicated or, if not indicated, as directed by Architect.
2. Build mockups for the following types of masonry in sizes approximately 48 inches long by 48 inches high by full thickness, including face and backup wythes and accessories. Include a sealant-filled joint at least 16 inches long in each mockup.
   a. Typical exterior wall with lower corner of window opening framed with stone trim at upper corner of mockup. Make opening approximately 12 inches wide by 16 inches high.
3. Clean exposed faces of mockups with masonry cleaner as indicated.
4. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
5. Notify Architect seven days in advance of dates and times when mockups will be constructed.
6. Protect accepted mockups from the elements with weather-resistant membrane.
7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
8. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
   a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
   b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.
9. Demolish and remove mockups when directed.
10. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

H. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

1. Protect Type I concrete masonry units from moisture absorption so that, at the time of installation, the moisture content is not more than the maximum allowed at the time of delivery.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by coverings spread on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. This specification supersedes ACI 530.1/ASCE 6/TMS 602 in that masonry shall not be installed when the ambient temperature is 32 degF or below or the temperature of the masonry units is below 32degF, unless a heated temporary enclosure is provided for a minimum of 24 hours. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602 when the ambient temperature is above 32degF. Masonry products shall always be protected from the elements.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
SECTION 04810 - UNIT MASONRY ASSEMBLIES

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.

1. When ambient temperature exceeds 100 deg F, or 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate

2.2 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.

2.3 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE6, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet vertically and horizontally of a walking surface.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.4 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
SECTION 04810 - UNIT MASONRY ASSEMBLIES

1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
2. Provide bullnose units for outside corners unless otherwise indicated.

B. Integral Water Repellent: Provide units made with integral water repellent for exposed units.
   1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514/E 514M as a wall assembly made with mortar containing integral water-repellent manufacturer’s mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.

C. CMU: ASTM C90.
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi minimum and as noted in drawings.
   2. Density Classification: Medium weight unless otherwise indicated.
   3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
   4. Exposed Faces: provide color and texture matching the range represented by Architect’s sample.
   5. Faces to Receive Plaster: Where units are indicated to receive a direct application of plaster, provide textured-face units made with gap-graded aggregates.

D. Concrete Building Brick: ASTM C 55.
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi minimum and as noted in the drawings.
   2. Density Classification: Medium weight.

2.5 CONCRETE AND MASONRY LINTELS

A. General: Provide as shown in drawings.

B. Concrete Lintels: ASTM C 1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated.

C. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section “Cast-in-Place Concrete”, and with reinforcing bars indicated.

D. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforced bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

2.6 BRICK

A. General: Provide utility brick.
   1. Provide Belden Brick Products (Basis of Design) or approved equal by Glen Gery Brick Endicott Brick.

B. Provide shapes indicated and as follows for each form of brick required:
1. Provide units without cores or frogs and with exposed surfaces finished for ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces.

C. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.

1. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

D. Building Brick: ASTM C 216, Grade SW, Type FBX and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 5,500 psi.
2. Size: Manufactured to the following actual dimensions:
3. Application: Use where brick is indicated for concealed locations. Note that hollow brick is not simply face brick with the usual cores (holes); it is brick that has voids (cores and cells) exceeding 25 percent of the gross cross-sectional area. See Evaluations.
4. Color and texture: Match the brick used at the Mathematics and Engineering Center (Clock Tower Building).

E. Paving Brick: ASTM C902, Class SX, Type 1 Application FX

1. Manufacturer: Glen Gery Brick or approved equal
2. Color and texture: Selected by Owner/Architect
3. Type: Repressed Chamfered
4. Size: 2-1/4” x 4” x 8”
5. Engraved pavers up to 15 characters included in allowance. Characters/list by Owner.

2.7 MORTAR AND GROUT MATERIALS

A. Regional Materials: Aggregate for mortar and grout, cement, and lime shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

C. Hydrated Lime: ASTM C 207, Type S.

D. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.

E. Mortar Cement: ASTM C 1329.
SECTION 04810 - UNIT MASONRY ASSEMBLIES

F. Masonry Cement: ASTM C 91.

1. For pigmented mortar, use a colored cement formulation as required to produce the color indicated or, if not indicated, as selected from manufacturer's standard formulations.
   a. Pigments shall not exceed 10 percent of portland cement by weight for mineral oxides nor 2 percent for carbon black.
   b. Pigments shall not exceed 5 percent of mortar cement by weight for mineral oxides nor 1 percent for carbon black.

2. For colored-aggregate mortar, use natural color or white cement as necessary to produce required mortar color.

G. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

1. White-Mortar Aggregates: Natural white sand or ground white stone.
2. Colored-Mortar Aggregates: Natural-colored sand or ground marble, granite, or other sound stone; of color necessary to produce required mortar color.


I. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.

J. Epoxy Pointing Mortar: ASTM C 395, epoxy-resin-based material formulated for use as pointing mortar for structural-clay tile facing units (and approved for such use by manufacturer of the units); in color indicated or, if not otherwise indicated, as selected by Architect from manufacturer's colors.

K. Cold-Weather Admixture: Permitted in accordance with ASTM C 494 Type E. No masonry work below 32 deg F.

L. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with concrete masonry units, containing integral water repellent by same manufacturer.

M. Water: Potable.

N. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

O. Products: Subject to compliance with requirements, provide one of the following or approved equal:

1. Colored Portland Cement-Lime Mix:
   a. Eaglebond; Blue Circle Cement.
   b. Color Mortar Blend; Glen-Gery Corporation.
   c. Rainbow Mortarmix Custom Color Cement/Lime; Holnam, Inc.
   d. Centurion Colorbond PL; Lafarge Corporation.
   e. Lehigh Custom Color Portland/Lime; Lehigh Portland Cement Co.
   f. Riverton Portland Cement Lime Custom Color; Riverton Corporation (The).
SECTION 04810 - UNIT MASONRY ASSEMBLIES

2. Mortar Cement:
   a. Magnolia Superbond Mortar Cement; Blue Circle Cement.
   b. Lafarge Mortar Cement; Lafarge Corporation.
   c. Essroc Cement Corporation.
   d. Approved equal

3. Colored Mortar Cement:
   a. Magnolia Superbond Mortar Cement; Blue Circle Cement.
   b. Approved Equal; Spec Mix, Inc.
   c. Approved Equal; Montfort Bros.
   d. Other Approved equal

4. Colored Masonry Cement:
   a. Magnolia Masonry Cement; Blue Circle Cement.
   b. Brixment-in-Color; Essroc Materials, Inc.
   c. Rainbow Mortamix Custom Color Masonry Cement; Holnam, Inc.
   d. Centurion Colorbond; Lafarge Corporation.
   e. Lehigh Custom Color Masonry Cement; Lehigh Portland Cement Co.
   f. Coosa Masonry Cement; National Cement Company, Inc.
   g. Flamingo Color Masonry Cement; Riverton Corporation (The).
   h. Richcolor Masonry Cement; Southdown, Inc.
   i. Approved Equal

5. Mortar Pigments:
   a. True Tone Mortar Colors; Davis Colors.
   b. Centurion Pigments; Lafarge Corporation.
   c. SGS Mortar Colors; Solomon Grind-Chem Services, Inc.
   d. Approved Equal

6. Water-Repellent Admixture: See Section 07200

2.8 REINFORCEMENT

A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

C. Masonry-Joint Reinforcement, General: ASTM A 951/A 951M.

1. Interior Walls: Mill-galvanized carbon steel.
2. Exterior Walls: STAINLESS STEEL.
3. Wire Size for Side Rods: W2.8 or 0.188-inch diameter.
4. Wire Size for Cross Rods: W2.8 or 0.188-inch diameter.
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5. Wire Size for Veneer Ties: 0.188-inch diameter.
6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
7. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

D. Masonry-Joint Reinforcement for Multiwythe Masonry:

1. Adjustable (two-piece) type, STAINLESS STEEL truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-winged loops connections having a maximum horizontal play of 1/16 inch and maximum vertical adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face.


3. Provide H&B stainless steel adjustable wall ties, 3/16-inch diameter pinteles and 3/16-inch diameter eyes with 2X-Hooks, Locate where additional ties are required at masonry openings and veneer movement joints.

E. BRICK MASONRY JOINT REINFORCEMENT

1. Stainless steel, truss type, with two side rods, one at each face of brick, with at least 5/8" cover on outside face.

2.9 TIES AND ANCHORS

A. General: ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

6. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.
7. Steel Plates, Shapes and Bars: ASTM A 36/A 36M.
8. Stainless-Steel Bars: ASTM A276 or ASTM A 666, Type 304.

C. Welded adjustable anchors for Connecting to Structural Steel Framing: Where indicated, or required, provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch diameter, hot-dip galvanized steel wire.
2. Tie Section: Triangular-shaped wire tie made from 0.25-inch diameter, hot-dip galvanized steel wire.

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3. Basis of design: Hohman & Barnard #359-C weld-on ties, with 8 inch offsets, 1/4 inch wire, Vee-Byna tie, wire diameter to match net tie space between structural steel and inside of weld-on ties plus or minus 1/16 inch clearance max, hot dip galvanized, shop welded to steel. Approved equal products will be considered in accordance with Section 01300 – Submittals.

4. Touch up welds with zinc-rich coating per approved shop paint SSPC-Paint 20 manufacturer’s recommendations.

D. Rigid anchors can be used to connect T-intersections of CMU shear walls in lieu of masonry bonding or bond beams. They are also often used at T-intersections of other CMU walls, although masonry bonding and T-shaped masonry-joint reinforcement may be used.

E. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 or with cross pins unless otherwise indicated.

1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.

F. Adjustable Masonry-Veneer Anchors:

1. General: Provide anchors that allow vertical adjustment but resist a minimum of 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.

2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.078-inch thick, stainless-steel sheet.

3. Fabricate wire ties from 0.188 inch diameter, STAINLESS STEEL wire unless otherwise indicated.

4. Contractor’s Option: Unless otherwise indicated, provide any of the adjustable masonry veneer anchors specified.

5. Screw or and post installed anchor attached, Masonry-Veneer Anchors: Wire tie and a rib-stiffened, sheet metal anchor section with screw holes top and bottom, with a projecting vertical tab having a slotted hole for inserting wire tie.

a. Attached to existing CMU

1) Basis of Design: Hohmann & Barnard HB-5213 adjustable veneer anchor with 2X-Hook and insulation retaining washer. Approved equal products will be considered in accordance with Section 01300 – Submittals

2) Fasten to existing CMU with 3/8-inch diameter stainless-steel sleeve anchor (Basis of Design: Powers Fasteners, Powerbolt) hex head sleeve anchor with 1 1/4 inch embedment in CMU faceshell and located within cell of CMU per manufacturer’s requirements. Approved equal products will be considered in accordance with Section 01300 – Submittals

3) Acceptable products:

   a) CTP-516 with CTP 2” post installed stainless steel and 2” bronze expansion anchor and insulation retaining washer.


   b) Or approved equal

b. Attached to steel studs
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1) Basis of Design: Hohmann & Barnard H&B-213 adjustable veneer anchor, 2X-Hook and insulation retaining washer. Approved equal products will be considered in accordance with Section 01300 – Submittals.

2) Fasten to steel stud with two (2) #10-16 hex head self-drilling screws with bonded neoprene washer and corrosion protective coating (Basis of Design: Hilti, Self-Drilling Screws and Kwik-Cote coating).

3) Other acceptable products:
   a) CTP-16 with fasteners noted above and insulation retaining washer.
   b) Or approved equal.

c. Attached to structural steel where indicated.

1) Unless noted otherwise, Basis of Design: Hohmann & Barnard HB-213 adjustable veneer anchor, 2X hooks and insulation retaining washer. Approved equal products will be considered in accordance with Section 01300 – Submittals

2) Where indicated: Hohmann & Barnard 359-FH Hot-Dip Galvanized with Vee Byna-Tie, 3/16” wire tie diameter.

3) Fasten to structural steel with two (2) 1/4 x 20 (Basis of Design: HILTI BI-METAL KWIK FLEX with HEX) washer head self-drilling fasteners. Approved equal products will be considered in accordance with Section 01300 – Submittals

4) Other acceptable products:
   a) CTP-16 with fasteners noted above and insulation retaining washer. www.ctpanchors.com
   b) Or approved equal.

2.10 FLEXIBLE FLASHING TYPE 304 STAINLESS STEEL

A. LAMINATED STAINLESS STEEL FABRIC FLASHING, NON-ASPHALTIC.

B. Definitions:

1. Cavity wall flashing: Same as flexible flashing.
2. Foundation sill flashing: Same as flexible flashing.
3. Flexible flashing: Water-proof material typically used in cavity wall construction to contain and assist in the proper water drainage that may penetrate wall system veneer. Other materials may be required to constitute the system.
4. Head and sill flashing: Same as flexible flashing.
5. Through-wall flashing:
   a. Generally considered the same as flexible flashing.
   b. Rare definition referred to full width cap flashing under copings or wall caps.

C. Submittals: Provide these documents in one complete shop drawings.

1. Product data: Indicate material type, composition, thickness, and installation procedures.
2. Samples: 3" by 5" flashing material.
3. Product quality and environmental submittals
   a. Certificates:
1) Indicate materials supplied or installed are asbestos free.
2) Indicate recycled content: 60% total recycled material; based on 60% Post Industrial Recycled Content.

b. Minimum Performance Requirements:

1) Tensile strength, 100,000 psi minimum average
2) Puncture Resistance, 2,500 pounds average
3) When tested as manufactured, product resists growth of mold pursuant to test method ASTM D3273.
4) Fire Rating: flame spread and smoke generation
   1. Rated Class A, ASTM E84
5) Certify the use of domestic manufactured stainless steel for flashing.
6) Certify products contain no silica or asbestos.

4. Required Compatibility letter:
   a. Provide compatibility letter from the Air Barrier System and Flashing System manufacturer.

D. QUALITY ASSURANCE

1. Qualifications:
   a. Manufacturer: Provide flashing materials by single manufacturer with not less than twenty-five years of experience in manufacturing flexible flashing products.
   b. Flashing materials must be able to withstand 300° F temperature without changing the long-term performance of the flashing.


F. Warranty

1. Special warranty:
   a. Manufacturer: Warrant flexible flashing material for life of the wall
   b. Begin warranty at the Date of Substantial Completion.

G. MANUFACTURED UNITS

1. Product standard of quality: Approved equal products will be considered in accordance with Section 01300 – Submittals.
   a. York Manufacturing, Inc.; Multi-Flash SS- Basis of Design
   b. Illinois Products, Inc.; IPCO Stainless Steel Fabric Flashing
   c. Prosoco, Inc.; R-Guard SS ThruWall
   d. STS Coatings, Inc.; Wall Guardian Stainless Steel TWF
   e. TK Products, Inc.; TK TWF
   f. Other products that meet the criteria in section 1.04 to 1.06.

2. Characteristics:
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a. Type: **Stainless Steel** core with polymer fabric laminated to the bottom stainless steel face with non-asphalt adhesive. The top face (exposed side) must not be covered with a polymer fabric.

b. **Stainless Steel**: type 304, ASTM A240. Domestically sourced per DFARS 252.225-7008 and/or DFARS 252.225-7009.

c. Fabric: polymer fabric; laminated back face (non-exposed side) of stainless steel core.

d. Size: Manufacturer's standard width rolls.

H. ACCESSORIES:

1. Mastic/sealant: The Basis of Design is York Manufacturing, Inc.; UniverSeal US100 or approved equal.

   a. Characteristics:

      1) Type: One part 100% solids, solvent-free formulated silyl-terminated polyether (STPE), ASTM C920-11, Type S, Grade NS, Class 50.

2. End dam: Provide preformed pieces by the flashing manufacturer using:

   a. Stainless steel: 26 gauge stainless steel

3. Splice material: Product standard of quality is York304 SS by York or approved equal. Manufacturer's standard self-adhered metal material; material matching system material or use Multi-Flash Stainless Steel 6" lap piece and polyether sealant as a splice.

4. Termination bar: Product standard of quality is York T-96 termination bar or approved equal. Manufacturer's standard 1" composite material bar or a 1" 26 gauge stainless steel termination bar with sealant lip.


7. Fasteners: 304 Stainless Steel Domestic manufactured fastener types and sizes recommended by flashing manufacturer for intended use.

I. INSTALLATION

1. General

   a. Install where indicated, specified, or required in accord with flashing manufacturer's written instructions and as follows.

   b. Extend flashing 8" minimum beyond opening. Provide pre-manufactured end dam units made of 26 gauge stainless steel.

   c. Flashing width: Width required starting flush with outside face of exterior wythe, extending through cavity, rising height required to extend above lintel steel at least 2". Flashing shall be installed a minimum of 1" past the face of veneer and cut off flash after inspection by C. M. or Architect.
d. Splice end joints by overlapping them 6" and seal with a compatible sealant or metal splice tape.
e. Masonry back up:
   1) Coordinate with fluid applied membrane air barrier installation, in accordance with manufacturer’s installation instructions.
   2) Embed flashing between CMU masonry installation and seal the top edge with compatible sealant.
f. Concrete back up:
   1) Surface apply after fluid applied membrane air barrier installation in accordance with manufacturer’s installation instructions.
   2) Fasten to concrete surface at top by embedding in layer of sealant or use a non-corrosive termination bar and fasten it to the backer wall at the top edge of the flashing and seal the top edge with a compatible sealant.
g. Stud back up with sheathing:
   1) Fasten to stud back-up. Install double faced butyl tape then install a non-corrosive termination bar and fasten it to the backer wall at the top edge of the flashing and seal the top edge with a compatible sealant.
h. Leave ready for certified compatible air barrier installation lapping flashing top installed in another Section.
i. Lay flashing in continuous bead of sealant on masonry supporting steel.
j. Provide purchased manufacturers preformed end dams.
k. Inside and outside corners: Provide purchase manufactured corners from manufacturer.
l. Cover flashing within a few days of installation to protect it from damage from the different trades, the environment and falling debris. If flashing is left unprotected and it is punctured, torn, or has loose scrim you should contact the manufacturer for repair instructions.

J. SCHEDULES

1. Locations:
   a. Exterior door heads.
   b. Window heads and sills.
   c. Storefront heads.
   d. Horizontal control joints.
   e. Changes in veneer materials, vertically.
   f. Other wall openings.
   g. Other locations indicated.

2.11 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.
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B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D 226M, Type 1 (No. 15 asphalt felt).

D. Weep/Cavity Vent Products:

1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected form manufacturer’s standard.

2. Products
   a. Basis of Design: Hohmann & Barnard QV Quadro Vent full mortar joint height
      Color to match mortar
   b. Or approved equal.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

1. Configuration: Provide one of the following:
   a. Strips, full depth of cavity and 10 inches high with dovetail-shaped notches 7 inches deep that prevent clogging with mortar droppings.
   b. Strips, not less than 3/4 inch thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.
   c. Sheets or strips, full depth of cavity and installed to full height of cavity.

2.12 CAVITY-WALL INSULATION

A. Mineral-Wool Blanket, Unfaced: ASTM C665, Type 1 (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of zero, respectively, per ASTM E 84; passing ASTM E 136 for non-combustible characteristics.

1. Products:
   b. Or approved equal.

B. Mineral-Wood Board, Unfaced: ASTM C612, Type IVB; with maximum flame-spread and smoke-developed indexes of zero, respectively, per ASTM 84; passing ASTM E 136 for Non-Combustible characteristics. Nominal density of 4.4-5.3 lb/cu. ft.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

2. Basis of Design Product: Subject to compliance with requirements, provide Roxul; CAVITYROCK or comparable product by one of the following:
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a. Owens Corning
b. Or approved equal.

C. Insulation Fasteners:

1. Mechanically attach Mineral Wool Board to masonry, use adjustable veneer anchors and ties with insulation retaining washers.
2. Mechanically attach Mineral Wool Board to masonry in the absence of adjustable wall ties, Basis of Design Ramset Insulfast power actuated fastener. Install per insulation manufacturer requirements.
3. Mechanically attach Mineral Wood Board to steel, impaling pin and retaining washer, mechanically fastened to steel substrates with two (2) self-drilling screws.
4. Mechanically attach Mineral Wood Board to cold-formed metal framing self-drilling fastener with 2-inch diameter composite insulation washer. Install per insulation manufacturer requirements.

2.13 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1 gal. of water.

B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Available Products: Subject to compliance with requirements, products that may be used to clean unit masonry surfaces include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following or approved equal:

a. Cleaners for Red and Light-Colored Brick Not Subject to Metallic Staining with Mortar Not Subject to Bleaching:

1) 202 New Masonry Detergent; Diedrich Technologies, Inc.
2) Sure Klean No. 600 Detergent; ProSoCo, Inc.
3) Florok 700 Masonry Detergent; Chargar Corporation.
4) Approved equal

b. Cleaners for Red and Dark-Colored Brick Not Subject to Metallic Staining:

1) 200 Lime Solv; Diedrich Technologies, Inc.
2) Sure Klean No. 101 Lime Solvent; ProSoCo., Inc.
3) Chargar Corporation.
4) Approved equal

c. Cleaners for Brick Subject to Metallic Staining:

1) 202V Vana-Stop; Diedrich Technologies, Inc.
2) Sure Klean Vana Trol; ProSoCo, Inc.
3) Chargar Corporation.
4) Approved equal
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2.14 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, to ensure that mortar color is consistent.

B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification.

1. Extended-Life Mortar for Unit Masonry: Mortar complying with ASTM C 1142 may be used instead of mortar specified above, at Contractor's option.
2. Limit cementitious materials in mortar for exterior and reinforced] masonry to portland cement, mortar cement, and lime.
3. For masonry below grade, in contact with earth, and where indicated, use Type S.
4. For reinforced masonry and where indicated, use Type S.
5. For exterior, veneer brick use Type N.

D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.

1. Pigments shall not exceed 10 percent of Portland cement by weight
2. Mix to match Architect's sample.
3. Application: Use pigmented mortar for exposed mortar joints with the following units:
   a. Clay face brick.

E. Grout for Unit Masonry: Comply with ASTM C 476.

1. Use grout of type indicated or, if not otherwise indicated, of type fine that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Self-consolidated grout where indicated (SCG): ASTM C476 fine grout, pre-batched, pre-bagged, dry ingredients ready for hydration at the project site. Site proportioned grout will be rejected.
   a. Specified minimum 28-day compressive strength is 3000 psi (ASTM C1019);
   b. Slump flow (ASTM C1611) 24 inches to 28 inches;
   c. T50 = 2 to 5 seconds
   d. Visual Stability Index (VSI) = 0;
   e. Basis of Design: SPEC MIX SCG, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

UNIT MASONRY ASSEMBLIES
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A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at the time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements: or minus 1/4 inch (6 mm).

1. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
2. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch total.

B. Lines and Levels:
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1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet or 1/2 inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet or 1/2 inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet or 1/2 inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet in, 3/8 inch in 20 feet or 1/2 inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2 inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3mm), with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch.
4. For exposed head joints, do not vary form thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joints and head-joint thicknesses by more than 1/8 inch.
5. For exposed bed joints and head joints of stacked bond, do not vary from straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

1. One-half running bond with vertical joint in each course centered on units in courses above and below.
2. Stack bond.
3. One-third running bond.
4. As indicated on Drawings.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
SECTION 04810 - UNIT MASONRY ASSEMBLIES

D. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

F. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

H. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

I. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
3. At fire-rated partitions, install firestopping in joint between top of partition and underside of structure above to comply with Division 7 Section "Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay CMU as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with grout at anchors and ties as needed to fully embed anchors and ties in mortar.

B. Lay solid masonry units and hollow brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor and similar holes.

1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
2. Allow cleaned surfaces to dry before setting.
3. Wet joint surfaces thoroughly before applying mortar.
4. Rake out mortar joints for pointing with sealant.
SECTION 04810 - UNIT MASONRY ASSEMBLIES

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

E. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

F. Cut joints flush where indicated to receive waterproofing, cavity wall insulation and air barriers unless otherwise indicated.

3.6 BONDING OF MULTIWYTHE MASONRY

A. Use bonding system indicated on Drawings.

B. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.
   1. Provide continuity with masonry joint reinforcement at corners by using prefabricated "L" units as well as masonry bonding.

C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
   1. Provide continuity with masonry joint reinforcement by using prefabricated "T" units.

3.7 CAVITY WALLS

A. Bond wythes of cavity walls together as follows:
   1. Individual Metal Ties as indicated on drawings: Provide ties as shown installed in horizontal joints, but not less than one metal tie for 1.77 sq. ft. of wall area spaced not to exceed 24 inches o.c. horizontally and 16 inches o.c. vertically. Stagger ties in alternate courses. Provide additional ties around openings and space as indicated around perimeter of openings. At intersecting and abutting walls, provide ties at no more than 24 inches o.c. vertically.
      a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) ties.
      b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) ties to allow for differential movement regardless of whether bed joints align.
      a. Where bed joints of wythes do not align, use adjustable-type (two-piece-type) reinforcement.
      b. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement to allow for differential movement regardless of whether bed joints align.

B. Bond wythes of cavity walls together using bonding system indicated on drawings.
SECTION 04810 - UNIT MASONRY ASSEMBLIES

C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity. Provide clean out units (CMU or clay facing) every other unit for the length of the work. Remove accumulated mortar at completion of each lift of work. Install cleanout unit after top of masonry is completed.

D. Parg all cavity face of backup wythe in a single coat to match existing (approximately 1/2 inch (10 mm)) thick. Trowel face of parge coat smooth to match existing and as required by the air barrier manufacturer.

3.8 ANCHORED MASONRY VENEERS

A. Anchor masonry veneers to wall framing and structural steel and masonry backup with masonry-veneer anchors to comply with the following requirements:

1. Fasten fastener-attached anchors through sheathing to wall framing and to masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.

2. Embed tie sections in masonry joints.

3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.

4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally, with not less than one anchor for each 1.77 sq. ft. of wall area. Install additional anchors around openings and at intervals, not exceeding 8 inches, around perimeter and as indicated.

B. Provide not less than 1 inch of airspace between back of masonry veneer and face of insulation.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace. Provide clean out units (CMU or clay facing) every other unit for the length of the work. Remove accumulated mortar at completion of each lift of work. Install cleanout unit after top of masonry is completed.

3.9 MASONRY-JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement at minimum of 6 inches.

1. Space reinforcement not more than 16 inches o.c.

2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.

3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.
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E. Install brick masonry joint reinforcement at heads and sills of openings in brick veneer as indicated. Coordinate bed joint locations with adjustable anchor/ties. Do not install joint reinforcement in the same bed joint as the anchor/ties.

3.10 ANCHORING MASONRY TO STRUCTURAL STEEL

A. Anchor masonry to structural steel, where masonry abuts or faces structural steel or concrete, to comply with the following:

1. Provide an open space not less than 1 inch wide between masonry and structural steel unless otherwise indicated. Keep open space free of mortar and other rigid materials.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
3. Space anchors as indicated.

3.11 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry using one of the following methods:

1. Fit bond-breaker strips into hollow contour in ends of CMUs on one side of control joint. Fill resultant core with grout, and rake out joints in exposed faces for application of sealant.
2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar, or rake out joint for application of sealant.
4. Install temporary foam-plastic filler in head joints, and remove filler when unit masonry is complete for application of sealant.

C. Form expansion joints in brick as follows:

1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade at junctures with horizontal expansion joints if any.
2. Build flanges of factory-fabricated, expansion-joint units into masonry.
3. Build in compressible joint fillers where indicated.
4. Form open joint full depth of brick wythe and of width indicated, but not less than 1/2 inch for installation of sealant and backer rod.

D. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod but not less than 1/2 inch.

1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.12 LINTELS

A. Install galvanized steel lintels where indicated.
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B. Provide concrete or masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches for block-size units shown without structural steel or other supporting lintels.

C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.13 FLASHING, WEEP HOLES, WATERPROOFING AND CAVITY VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, and tape as recommended by flashing manufacturer.

2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up fact of sheathing or masonry backup in accordance with barrier system manufacturer requirements at least 8 inches; with upper edge tied into water-resistive barrier, lapping at least 6 inches. Fasten upper edge of flexible flashing to sheathing through termination bar. Provide cut off sealant above termination bar to CMU.

3. At lintels and shelf angles, extend flashing at minimum of 6 inches into masonry at each end. At heads and sills, extend flashing a minimum of 6 inches at ends and turn up not less than 2 inches to form end dams at nearest head joint.

4. Install metal drip plates beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to tope of metal drip plate.

5. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to tope of metal flashing termination.

6. Provide minimum of 3 inches lap into drip plate. Set drip plate in continuous bed of butyl sealant. Set butyl on grouted solid brick course.

7. Install continuous self-adhering base of wall waterproofing flush to exterior surface of trench foundation wall, extend horizontally inward to intersecting masonry wall and rise to the underside of through wall flashing location, terminate with termination bar to CMU wall, prime surfaces as required by approved manufacturer to provide complete adhesion.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.

1. Use specified weep/cavity vent products to form weep holes.

3.14 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
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1. Construct formwork to provide shape, line and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie and support forms to maintain position and shape during construction and curing of reinforced masonry.

2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

   1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 inches.

3.15 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform test and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

C. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.16 REPAIRING, POINTING AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes and completely fill with mortar. Point up joints, including corners, openings and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar in thoroughly set and cured, clean exposed masonry as follows:

   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
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3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
7. Clean masonry with a proprietary acidic cleaner applied according to the manufacturer’s written instructions.
8. Clean stone trim to comply with stone supplier’s written instructions.
9. Clean limestone units to comply with recommendations in ILI’s “Indiana Limestone Handbook”.

3.17 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excel masonry materials are Contractor’s property. At completion of unit masonry work, remove from project site.

B. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used, as described above or recycled, and other masonry waste and legally dispose of off Owner’s property.

END OF SECTION 04810
SECTION 05120 - STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section includes structural steel.
B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section "Quality Control" for independent testing agency procedures and administrative requirements.
   2. Division 5 Section "Metal Fabrications" for loose steel bearing plates and miscellaneous steel framing.
   3. Division 9 Section "Painting" for surface preparation and priming requirements.

1.3 PERFORMANCE REQUIREMENTS
A. Structural Performance: Engineer structural steel connections required by the Contract Documents to be selected or completed by the fabricator to withstand design loadings indicated.
B. Engineering Responsibility: Engage a fabricator who utilizes a qualified professional engineer to prepare calculations, Shop Drawings, and other structural data for structural steel connections.

1.4 SUBMITTALS
A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
B. Product Data for each type of product specified.
C. Shop Drawings detailing fabrication of structural steel components.
   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
   2. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
   3. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tension, or tensioned shear/bearing connections.
   4. Include Shop Drawings signed and sealed by a qualified professional engineer responsible for their preparation.
SECTION 05120 - STRUCTURAL STEEL

D. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Mill test reports signed by manufacturers certifying that their products, including the following, comply with requirements.

1. Structural steel, including chemical and physical properties.
2. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
3. Direct-tension indicators.
4. Shop primers.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed structural steel work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Fabricator Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work.

C. Comply with applicable provisions of the following specifications and documents:

4. ASTM A 6 (ASTM A 6M) "Specification for General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use."

D. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for projects with structural steel framing that are similar to that indicated for this Project in material, design, and extent.

E. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel."

1. Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."
SECTION 05120 - STRUCTURAL STEEL

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver structural steel to Project site in such quantities and at such times to ensure continuity of installation.

B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.

1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
2. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.7 SEQUENCING

A. Supply anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 MATERIALS AS INDICATED.

A. Structural Steel Shapes, Plates, and Bars: As follows:

2. High-Strength, Low-Alloy Columbium-Vanadium Steel: ASTM A 992, Grade 50.
3. High-Strength, Low-Alloy Structural Steel: ASTM A 588, Grade 50, corrosion resistant.

B. Cold-Formed Structural Steel Tubing: ASTM A 500, Grade B.

C. Hot-Formed Structural Steel Tubing: ASTM A 501.

D. Steel Pipe: ASTM A 53, Type E or S, Grade B.

1. Weight Class: Standard unless indicated otherwise.
2. Finish: Black, except where indicated to be galvanized.


F. High-Strength Steel Castings: ASTM A 148, Grade 80-50.

G. Shear Connectors: ASTM A 108, Grade 1015 through 1020, headed-stud type, cold-finished carbon steel, AWS D1.1, Type B.

H. Anchor Rods, Bolts, Nuts, and Washers: As follows:
SECTION 05120 - STRUCTURAL STEEL

2. Headed Bolts: ASTM A 307, Grade A; carbon-steel, hex-head bolts; and carbon-steel nuts.
3. Headed Bolts: ASTM A 325, Type 1, heavy hex steel structural bolts and heavy hex carbon-steel nuts. Use where high strength bolts are indicated.

I. Nonhigh-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A; carbon-steel, hex-head bolts; carbon-steel nuts; and flat, unhardened steel washers.
   1. Finish: Hot-dip zinc-coating, ASTM A 153, Class C.

J. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers.
   1. Finish: Hot-dip zinc-coating, ASTM A 153, Class C.

K. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
   1. Finish: Mechanically deposited zinc coating.

L. Welding Electrodes: Comply with AWS requirements.

2.2 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer.

B. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds and repair painting galvanized steel, with dry film containing not less than 93 percent zinc dust by weight, and complying with DOD-P-21035A or SSPC-Paint 20.

2.3 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application, and a 30-minute working time.

2.4 FABRICATION

A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate structural steel according to AISC specifications referenced in this Section and in Shop Drawings.

   1. Camber structural steel members where indicated.
   2. Identify high-strength structural steel according to ASTM A 6 and maintain markings until steel has been erected.
   3. Mark and match-mark materials for field assembly.
   4. Fabricate for delivery a sequence that will expedite erection and minimize field handling of structural steel.
SECTION 05120 - STRUCTURAL STEEL

5. Complete structural steel assemblies, including welding of units, before starting shop-priming operations.


B. Fabricate architecturally exposed structural steel with exposed surfaces smooth, square, and free of surface blemishes, including pitting, rust, scale, seam marks, roller marks, rolled trade names and roughness.

1. Remove blemishes by filling or grinding, or by welding and grinding, prior to cleaning, treating, and shop priming.

2. Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.

C. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded.

D. Finishing: Accurately mill ends of columns and other members transmitting loads in bearing.

E. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's printed instructions.

F. Holes: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on Shop Drawings.

1. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.5 SHOP CONNECTIONS

A. Shop install and tighten high-strength bolts according to RCSC's Allowable Stress Design Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.

1. Bolts: ASTM A 325 high-strength bolts, unless otherwise indicated.

2. Connection Type: Snug tightened, unless indicated as slip-critical, direct-tension, or tensioned shear/bearing connections.

B. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.

2. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent surface bleeding of back-side welding on exposed steel surfaces. Grind smooth exposed fillet welds 1/2 inch and larger. Grind flush butt welds. Dress exposed welds.
SECTION 05120 - STRUCTURAL STEEL

2.6 SHOP PRIMING

A. Shop prime steel surfaces, except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed-on fireproofing.
5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare surfaces according to SSPC specifications as follows:

1. SPC-SP 3 "Power Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply 2 coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.

D. Painting: Apply a 1-coat, nonasphaltic primer complying with SSPC's "Painting System Guide No. 7.00" to provide a dry film thickness of not less than 1.5 mils.

2.7 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel indicated for galvanizing according to ASTM A 123.

2.8 SOURCE QUALITY CONTROL

A. The Contractor will employ and pay for an independent testing and inspecting agency to perform shop inspections and tests and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether test specimens comply with or deviate from requirements.
2. Provide testing agency with access to places where structural steel Work is being fabricated or produced so required inspection and testing can be accomplished.

B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.

C. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.
SECTION 05120 - STRUCTURAL STEEL

D. Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1. Direct-tension indicator gaps will be verified to comply with ASTM F 959, Table 2.

E. In addition to visual inspection, shop-welded connections will be inspected and tested according to AWS D1.1 and the inspection procedures listed below, at testing agency's option.

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before erection proceeds, and with the steel erector present, verify elevations of concrete and masonry bearing surfaces and locations of anchorages for compliance with requirements.

B. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.

B. Base and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.

1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
3. Pack grout solidly between bearing surfaces and plates so no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
SECTION 05120 - STRUCTURAL STEEL

a. Comply with manufacturer's instructions for proprietary grout materials.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."


D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

E. Remove erection bolts on welded, architecturally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.

F. Do not use thermal cutting during erection.

G. Finish sections thermally cut during erection equal to a sheared appearance.

H. Do not enlarge unfair holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. Install and tighten nonhigh-strength bolts, except where high-strength bolts are indicated.

B. Install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1. Bolts: ASTM A 325 high-strength bolts, unless otherwise indicated.
2. Connection Type: Snug tightened, unless indicated as slip-critical, direct-tension, or tensioned shear/bearing connections.

C. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.

1. Comply with AISC specifications referenced in this Section for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.
SECTION 05120 - STRUCTURAL STEEL

3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent surface bleeding of back-side welding on exposed steel surfaces. Grind smooth exposed fillet welds 1/2 inch and larger. Grind flush butt welds. Dress exposed welds.

3.5 FIELD QUALITY CONTROL

A. Owner will employ and pay for an independent testing and inspecting agency to perform field inspections and tests and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from requirements.

B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.

C. Additional testing will be performed to determine compliance of corrected Work with specified requirements. Contractor will reimburse Owner for the costs of these additional tests.

D. Field-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1. Direct-tension indicator gaps will be verified to comply with ASTM F 959, Table 2.

E. In addition to visual inspection, field-welded connections will be inspected and tested according to AWS D1.1 and the inspection procedures listed below, at testing agency's option.

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.

3.6 CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.

1. Apply by brush or spray to provide a minimum dry film thickness of 1.5 mils.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint according to ASTM A 780.

END OF SECTION 05120
SECTION 05210 - STEEL JOISTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Open-web K-series steel joists where indicated
2. Joist accessories.

B. Related Sections include the following:

1. Division 3 Section "Cast-in-Place Concrete" for installing bearing plates in concrete.
2. Division 4 Section "Unit Masonry Assemblies" for installing bearing plates in unit masonry.
3. Division 5 Section "Metal Fabrications" for furnishing steel bearing plates.
4. Division 9 Section "Painting" for prime painting.

1.3 DEFINITIONS

A. Special Joists: Joists requiring modification by the manufacturer to support nonuniform, unequal, or special loading conditions that invalidate SJI's "Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders."

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide special joists and connections capable of withstanding the following design loads within limits and under conditions indicated:

1. Design Loads: As indicated on the Structural Drawings

B. Design joists to withstand design loads with total load deflections no greater than the following:


1.5 SUBMITTALS

A. Product Data: For each type of joist, accessory, and product indicated.
SECTION 05210 - STEEL JOISTS

B. Shop Drawings: Show layout, mark, number, type, location, and spacings of joists. Include joining and anchorage details, bracing, bridging, accessories; splice and connection locations and details; and attachments to other construction.

1. Indicate locations and details of anchorage devices and bearing plates to be embedded in other construction.
2. Comprehensive engineering analysis signed and sealed by the qualified professional engineer responsible for its preparation when required.

C. Welding Certificates: Copies of certificates for welding procedures and personnel.

D. Mill certificates signed by manufacturers of bolts certifying that their products comply with specified requirements.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. Research/Evaluation Reports: Evidence of steel joists' compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing joists similar to those indicated for this Project and with a record of successful in-service performance.

1. Manufacturer must be certified by SJI to manufacture joists complying with SJI standard specifications and load tables.
2. Assumes responsibility for engineering special joists to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
3. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of joists that are similar to those indicated for this Project in material, design, and extent.

B. SJI Specifications: Comply with SJI's "Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders" (hereafter, "Specifications"), applicable to types of joists indicated.

C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel", and AWS D1.3 "Structural Welding Code--Sheet Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
SECTION 05210 - STEEL JOISTS

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

1.8 SEQUENCING

A. Deliver steel bearing plates and other devices to be built into concrete and masonry construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJL's "Specifications" for chord and web members.

B. Steel Bearing Plates: ASTM A 36/A 36M.

C. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A, carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.


D. Welding Electrodes: Comply with AWS standards.

E. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035 or approved equal.

2.2 PRIMERS

A. Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer with good resistance to normal atmospheric corrosion, complying with performance requirements in FS TT-P-664.

2.3 OPEN-WEB K-SERIES STEEL JOISTS


   1. Joist Type: K and KCS-series steel joists.

B. Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.

C. Provide holes in chord members for connecting and securing other construction to joists.

D. Top-Chord Extensions: Extend top chords of joists with SJL's Type S top-chord extensions where indicated, complying with SJL's "Specifications."
SECTION 05210 - STEEL JOISTS

E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."

F. Camber joists according to SJI's "Specifications", as required.

G. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.

2.5 JOIST ACCESSORIES

H. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span.

I. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications."

J. Bridging: Fabricate as indicated and according to SJI's "Specifications."

1. Furnish additional erection bridging if required.

K. Fabricate steel bearing plates with integral anchorages of sizes and thicknesses indicated. Hot-dip zinc coat according to ASTM A 123/A 123M.

L. Steel bearing plates with integral anchorages are specified in Division 5 Section "Metal Fabrications."

M. Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface, unless otherwise indicated.

N. Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.6 CLEANING AND SHOP PAINTING

O. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories to be primed by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.

P. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

Q. Apply one shop coat of primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

R. Painting of joists and joist accessories is specified in Division 9 Section "Painting."

PART 3 - EXECUTION

3.1 EXAMINATION
SECTION 05210 - STEEL JOISTS

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.

C. Field weld joists to supporting steel bearing plates. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts, unless otherwise indicated.

E. Bolt joists to supporting steel framework using high-strength structural bolts, unless otherwise indicated. Comply with RCSC's "Allowable Stress Design Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.

F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner shall employ and pay for a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Field welds will be visually inspected according to AWS D1.1.

C. In addition to visual inspection, field welds will be tested according to AWS D1.1 and the following procedures, as applicable:

1. Magnetic Particle Inspection: ASTM E 709.
2. Liquid Penetrant Inspection: ASTM E 165.
SECTION 05210 - STEEL JOISTS

D. Bolted connections will be visually inspected.
   1. High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Allowable Stress Design Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts."

E. Correct deficiencies in Work that inspections and test reports have indicated are not in compliance with specified requirements.

F. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

3.4 REPAIRS AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories, bearing plates and abutting structural steel.
   1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
   2. Apply a compatible primer of the same type as the shop primer used on adjacent surfaces.

C. Touchup Painting: Cleaning and touchup painting are specified in Division 9 Section "Painting."

D. Provide final protection and maintain conditions, in a manner acceptable to manufacturer, Installer and Engineer that ensure joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 05210
SECTION 05310 - STEEL DECK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Roof deck when indicated.
2. Composite floor deck when indicated.

B. Related Sections include the following:

1. Division 3 Section "Cast-in-Place Concrete" for concrete fill and reinforcing steel.
2. Division 5 Section "Structural Steel" for shop-welded shear connectors.
3. Division 5 Section "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
4. Division 9 Section "Painting" for repair painting of painted deck.

1.3 SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, deck openings, special jointing, accessories, and attachments to other construction.

C. Product Certificates: Signed by steel deck manufacturers certifying that products furnished comply with requirements.

D. Welding Certificates: Copies of certificates for welding procedures and personnel.

E. Product Test Reports: From a qualified testing agency indicating that each of the following complies with requirements, based on comprehensive testing of current products:

1. Mechanical fasteners.

F. Research/Evaluation Reports: Evidence of steel deck's compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE
SECTION 05310 - STEEL DECK

A. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.


D. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those steel deck units tested for fire resistance per ASTM E 119 by a testing and inspection agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.

2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

E. AISI Specifications: Calculate structural characteristics of steel deck according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members."


1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

1.6 COORDINATION

A. Coordinate installation of sound-absorbing insulation strips in topside ribs of acoustical deck with roofing installation specified in Division 7 to ensure protection of insulation strips against damage from effects of weather and other causes.

B. Coordinate layout and installation of trench headers, preset inserts, duct fittings, and other components specified in Division 16 Section "Underfloor Raceway" with installation of cellular metal floor deck.
SECTION 05310 - STEEL DECK

PART 2 - PRODUCTS

2.1 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:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:

1. Steel Deck:
   a. BHP Steel Building Products USA Inc.
   b. Consolidated Systems, Inc.
   c. Epic Metals Corp.
   d. Marlyn Steel Products, Inc.
   e. Nucor Corp.; Vulcraft Div.
   f. Roof Deck, Inc.
   g. United Steel Deck, Inc.
   h. Verco Manufacturing Co.
   i. Wheeling Corrugating Co.; Div. of Wheeling-Pittsburgh Steel Corp.
   j. Or approved equal

2.2 ROOF DECK

A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 29, and the following:
   1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.
   2. Deck Profile: As Indicated.
   3. Profile Depth: As indicated
   4. Design Uncoated-Steel Thickness: As indicated
   5. Design Uncoated-Steel Thicknesses; Deck Unit/Bottom Plate: As indicated
   6. Span Condition: As indicated.
   7. Side Laps: As indicated

2.3 COMPOSITE FLOOR DECK

A. Composite Steel Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 29, the minimum section properties indicated, and the following:
   1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 minimum or as indicated, G60 zinc coating.
   2. Profile Depth: As Indicated.
   3. Design Uncoated-Steel Thickness: As indicated
   4. Span Condition: As indicated
SECTION 05310 - STEEL DECK

2.4 ACCESSORIES

A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Steel Sheet Accessories: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.

G. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 29 for overhang and slab depth.

H. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.

I. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.

J. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, .0598 inch thick, with factory-punched hole of 3/8-inch minimum diameter.

K. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, with 3-inch- wide flanges and recessed pans of 1-1/2- inch minimum depth. For drains, cut holes in the field.

L. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.

M. Shear Connectors: ASTM A 108, Grades 1010 through 1020 headed stud type, cold-finished carbon steel, AWS D1.1, Type B, with arc shields.

N. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 94 percent zinc dust by weight.

O. Repair Paint: Lead- and chromate-free rust-inhibitive primer complying with performance requirements of FS TT-P-664.

PART 3 - EXECUTION
SECTION 05310 - STEEL DECK

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 29, manufacturer's written instructions, and requirements in this Section.

B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.

C. Locate decking bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

   1. Align cellular deck panels for entire length of cell runs and align cells at ends of abutting panels.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to decking.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.3 ROOF DECK INSTALLATION

A. Fasten roof deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter, but not less than 1-1/2 inches long, and as follows:


   2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds as indicated.

   3. Weld Washers: Install weld washers at each weld location.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports as indicated, and as follows

   1. Mechanically fasten with self-drilling No. 10 diameter or larger carbon-steel screws.
2. Mechanically clinch or button punch.
3. Fasten with a minimum of 1-1/2-inch-long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
   1. End Joints: Lapped 2 inches minimum

D. Roof Sump Pans and Sump Plates: Install over openings provided in roof decking and weld flanges to top of deck. Space welds not more than 12 inches apart with at least 1 weld at each corner.

E. Miscellaneous Roof Deck Accessories: Install ridge and valley plates, finish strips, cover plates, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.

F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

G. Sound-Absorbing Insulation: Installation into topside ribs of deck as specified in Division 7.

3.4 FLOOR DECK INSTALLATION

A. Fasten floor deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
   2. Weld Spacing: Weld edge ribs of panels at each support. Space additional welds an average of 12 inches apart, but not more than 18 inches apart.
   3. Weld Spacing: Space and locate welds as indicated.
   4. Weld Washers: Install weld washers at each weld location.

B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of 1/2 of the span or 36 inches, and as follows:
   1. Mechanically fasten with self-drilling No. 10 diameter or larger carbon-steel screws.
   2. Mechanically clinch or button punch.
   3. Fasten with a minimum of 1-1/2-inch-long welds.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
   1. End Joints: Lapped

D. Shear Connectors: Weld shear connectors through deck to supporting frame according to AWS D1.1 and manufacturer's written instructions. Butt end joints of deck panels; do not overlap. Remove and discard arc shields after welding shear connectors.
E. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.

F. Floor Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of decking. Weld cover plates at changes in direction of floor deck panels, unless otherwise indicated.

G. Install piercing hanger tabs not more than 14 inches apart in both directions, within 9 inches of walls at ends, and not more than 12 inches from walls at sides, unless otherwise indicated.

3.5 FIELD QUALITY CONTROL

A. Testing: Owner shall employ and pay for a qualified independent testing agency to perform field quality-control testing.

B. Field welds will be subject to inspection.

C. Shear connector stud welds will be inspected and tested according to AWS D1.1 for stud welding and as follows:

1. Shear connector stud welds will be visually inspected.
2. Bend tests will be performed if visual inspections reveal less than a full 360-degree flash or welding repairs to any shear connector stud.
3. Tests will be conducted on additional shear connector studs if weld fracture occurs on shear connector studs already tested according to AWS D1.1.

D. Testing agency will report test results promptly and in writing to Contractor and Architect.

E. Remove and replace work that does not comply with specified requirements.

F. Additional testing and inspecting will be performed to determine compliance of corrected work with specified requirements. Contractor will reimburse Owner for the costs of these additional tests.

3.6 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05310
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Interior non-load-bearing wall framing.
   2. Exterior non-load-bearing wall framing.

B. Related Sections include the following:
   1. Division 5 Section "Metal Fabrications" for masonry shelf angles and connections.
   2. Division 9 Section "Gypsum Board Assemblies" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.
   3. Division 9 Section "Gypsum Board Shaft-Wall Assemblies" for interior non-load-bearing, metal-stud-framed, shaft-wall assemblies.

1.3 DEFINITIONS

A. Minimum Uncoated Steel Thickness: Minimum uncoated thickness of cold-formed framing delivered to the Project site shall be not less than 95 percent of the thickness used in the cold-formed framing design. Lesser thicknesses shall be permitted at bends due to cold forming.

B. Producer: Entity that produces steel sheet coil fabricated into cold-formed members.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.

1.   Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
   a. Interior Non-Load-Bearing Wall Framing: Horizontal deflection of 1/360 of the wall height under a horizontal load of 5 lbf/sq. ft.
   b. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/600 of the wall height for backing brick veneer and 1/360 of the wall height for backing others.

2. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg. F.
3. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:

a. Upward and downward movement of 1/2 inch.

B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."

1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing - Header Design."
2. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

1.5 SUBMITTALS

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1. For cold-formed metal framing indicated to comply with design loads, include structural Analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency indicating steel sheet complies with requirements.

D. Welding Certificates: Copies of certificates for welding procedures and personnel.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. Product Test Reports: From a qualified testing agency indicating that each of the following complies with requirements, based on comprehensive testing of current products:

1. Expansion anchors.
2. Steel Sheet.
4. Mechanical fasteners.
5. Vertical deflection clips.
6. Miscellaneous structural clips and accessories.
G. Research/Evaluation Reports: Evidence of cold-formed metal framing's compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Engineering Responsibility: Engage a qualified professional engineer to prepare design calculations, Shop Drawings, and other structural data.

C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.

D. Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency indicating steel sheet complies with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and galvanized-coating thickness.

E. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.


G. Fire-Test-Response Characteristics: Where metal framing is part of a fire-resistance-rated assembly, provide framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.


H. AISI Specifications: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" for calculating structural characteristics of cold-formed metal framing:


I. Comply with HUD's "Prescriptive Method for Residential Cold-Formed Steel Framing."

J. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
SECTION 05400 - COLD-FORMED METAL FRAMING

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following or approved equal:

1. Allied Studco, Inc.
2. The Steel Network, Inc.
3. Dietrich Industries, Inc.
4. AllSteel Products, Inc.
5. Knorr Steel Framing Systems.
6. MarinoWare; Div. of Ware Industries, Inc.
7. Unimast, Inc.
8. United Metal Products, Inc.
9. Clark Steel Framing.
10. Steel Construction Systems.
11. Or approved equal

2.2 MATERIALS

A. Steel Sheet: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:

1. Grade: 33 minimum or as required by structural performance.
2. Coating: G60.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, complying with ASTM C 955, and as follows:

1. Minimum Uncoated-Steel Thickness: Matching steel studs.

C. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads, and as follows:

1. Minimum Uncoated-Steel Thickness: Matching steel studs.
2. Flange Width: Manufacturer’s standard deep flange width
SECTION 05400 - COLD-FORMED METAL FRAMING

D. Vertical Deflection Clips: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure.

2.3 EXTERIOR AND INTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0428 inch
2. Flange Width: 1-5/8 inches

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:

1. Minimum Base-Metal Thickness 0.0428 inch
2. Flange Width: 1-1/4 inches

C. Vertical Deflection Clips: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:

   a. Dietrich Metal Framing; a Worthington Industries Company.
   b. MarinoWare, a division of Ware Industries.
   c. SCAFCO Corporation
   d. The Steel Network, Inc.
   e. Or approved equal

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:

   a. Dietrich Metal Framing; a Worthington Industries Company.
   b. MarinoWare, a division of Ware Industries.
   c. SCAFCO Corporation
   d. The Steel Network, Inc.
   e. Or approved equal

2. Minimum Base-Metal Thickness: 0.0428
3. Flange Width: 1 inch plus the design gap for 1-story structures

E. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
SECTION 05400 - COLD-FORMED METAL FRAMING

1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal and lateral loads and transfer them to the primary structure, and as follows:
   a. Minimum Base-Metal Thickness: 0.0428 inch
   b. Flange Width: 1 inch plus the design gap for 1-story structures

2. Inner Track: Of web depth indicated, and as follows:
   a. Minimum Base-Metal Thickness: 0.0428 inch
   b. Flange Width: Equal to sum of outer deflection track flange width plus 1 inch

F. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure.

2.4 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
   1. Supplementary framing.
   2. Bracing, bridging, and solid blocking.
   3. Web stiffeners.
   4. Anchor clips.
   5. End clips.
   6. Foundation clips.
   7. Gusset plates.
   8. Stud kickers, knee braces, and girts.
   9. Joist hangers and end closures.

2.5 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123.

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
SECTION 05400 - COLD-FORMED METAL FRAMING

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E1190 conducted by a qualified independent testing agency.

E. Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.
   1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

F. Welding Electrodes: Comply with AWS standards.

2.6 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.

B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.

D. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.7 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed metal framing members by welding. Wire tying of framing members is not permitted. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
4. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
   a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
   b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
SECTION 05400 - COLD-FORMED METAL FRAMING

5. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

C. Grout bearing surfaces uniform and level to ensure full contact of bearing flanges or track webs on supporting concrete or masonry construction.

D. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to ASTM C 1007, unless more stringent requirements are indicated.
SECTION 05400 - COLD-FORMED METAL FRAMING

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
   1. Bolt or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer’s written recommendations and requirements in this Section.
   1. Cut framing members by sawing or shearing; do not torch cut.
   2. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

E. Install framing members in one-piece lengths, unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

H. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer’s standard punched openings.

J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 EXTERIOR AND INTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
SECTION 05400 - COLD-FORMED METAL FRAMING

B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:

1. Stud Spacing: 16 inches (Unless noted otherwise)

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single-leg deflection tracks and anchor to building structure.
2. Install double deep-leg deflection tracks and anchor outer track to building structure.
3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
4. Connect drift clips to cold formed metal framing and anchor to building structure.

E. Install horizontal bridging in curtain-wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.

1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of flat, taut, steel sheet straps of width and thickness indicated and stud or stud-track solid blocking of width and thickness matching studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
   a. Install solid blocking at 96-inch centers or as indicated on Shop Drawings.

2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.

3. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

4. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable curtain-wall-framing system.

3.5 GYPSUM SHEATHING INSTALLATION

A. General: Install gypsum sheathing to comply with GA-253 and manufacturer's written instructions.

B. Cut boards at penetrations, edges, and other obstructions of the work; fit tightly against abutting construction, except provide a 3/8-inch setback where non-load-bearing construction abuts structural elements.
C. Coordinate sheathing installation with flashing and joint sealant installation so these materials are installed in the sequence and manner that prevent exterior moisture from passing through completed exterior wall assembly.

D. Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.

E. Do not bridge building expansion joints with sheathing; cut and space edges to match spacing of structural support elements.

F. Horizontal Installation: Install 24-inch wide gypsum sheathing boards horizontally with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of stud flanges and stagger end joints of adjacent boards not less than one stud spacing. Screw-attach boards at perimeter and within field of board to each steel stud at approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.

G. Vertical Installation: Install 48-inch wide gypsum sheathing boards vertically with vertical edges centered over flanges of steel studs. Abut ends and edges of each board with those of adjacent boards. Screw-attach boards at perimeter and within field of board to each steel stud at approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.

H. Air-Infiltration Barrier Application: Cover sheathing with air-infiltration barrier as follows:

1. Cut back air-infiltration barrier 1/2 inch on each side of break in supporting members at expansion- or control-joint locations.
2. Apply asphalt-saturated organic felt horizontally with 2-inch overlap and 6-inch end lap; fasten to sheathing with corrosion-resistant staples.
3. Apply proprietary building wrap to comply with manufacturer's written installation instructions.
4. Apply air-infiltration barrier to cover vertical flashing with 4-inch overlap.

I. Sealing Sheathing Joints: Seal joints according to sheathing manufacturer's written recommendations and as follows:

1. Apply elastomeric sealant on joints and fasteners and trowel flat. Apply sufficient quantity of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints, and apply and trowel silicone emulsion sealant to embed sealant in entire face of tape. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.6 FIELD QUALITY CONTROL

A. Testing: Owner will employ and pay for a qualified independent testing agency to perform field quality-control testing.

B. Field and shop welds will be subject to inspection and testing.
SECTION 05400 - COLD-FORMED METAL FRAMING

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace Work that does not comply with specified requirements.

E. Additional testing and inspecting will be performed to determine compliance of corrected Work with specified requirements. Contractor will reimburse Owner for the costs of these additional tests.

3.7 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Touchup Painting: Wire brush, clean, and paint scarred areas, welds, and rust spots on fabricated and installed prime-painted, cold-formed metal framing. Paint framing surfaces with same type of shop paint used on adjacent surfaces.

C. Protect paper-surfaced gypsum sheathing that will be exposed to weather for more than 30 days by covering exposed exterior surface of sheathing with a securely fastened air-infiltration barrier. Apply covering immediately after sheathing is installed.

D. Protect cutouts, corners, and joints in sheathing by filling with a flexible sealant or by applying tape recommended by sheathing manufacturer at time sheathing is applied.

E. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05400
SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Loose steel lintels.
   2. Steel framing and supports for mechanical equipment.

1.3 SUBMITTALS

A. Product Data: For the following:
   1. Paint products.
   2. Grout.
   3. Hardware

B. Shop Drawings: Detail fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Welding: Qualify procedures and personnel according to the following:

   1. AWS D1.1, "Structural Welding Code--Steel."
   2. AWS D1.3, "Structural Welding Code--Sheet Steel."

1.5 PROJECT CONDITIONS

A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
SECTION 05500 - METAL FABRICATIONS

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.6 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

2.2 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.

C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

D. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500.

E. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

F. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.3 PAINT

A. Shop Primers: Provide primers that comply with Division 9 Section "Painting."

B. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

C. Shop Primer for Ferrous Metal: Organic zinc-rich primer, complying with SSPC-Paint 20 and compatible with topcoat.
SECTION 05500 - METAL FABRICATIONS


2.4 FASTENERS

A. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

   2. Material: Alloy Group 1 or 2 stainless-steel bolts complying with ASTM F 593 and nuts complying with ASTM F 594.

2.5 GROUT

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 CONCRETE FILL

A. Concrete Materials and Properties: Normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.

2.7 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Shear and punch metals cleanly and accurately. Remove burrs.

C. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Weld corners and seams continuously to comply with the following:
SECTION 05500 - METAL FABRICATIONS

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

E. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

F. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

G. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

H. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

I. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

J. Remove sharp or rough areas on exposed traffic surfaces.

K. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

2.8 LOOSE STEEL LINTELS

A. Fabricate loose structural-steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.

B. Weld adjoining members together to form a single unit where indicated.

C. Size loose lintels to provide bearing length at each side of openings equal to one-twelfth of clear span, but not less than 8 inches, unless otherwise indicated.

D. Galvanize loose steel lintels located in exterior walls.

2.9 SHELF ANGLES AND WELDED STEEL BOX CHASES
SECTION 05500 - METAL FABRICATIONS

A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.

B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete. Align expansion joints in angles with indicated control and expansion joints in cavity-wall exterior wythe.

C. Galvanize shelf angles to be installed in exterior walls.

D. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.10 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports that are not a part of structural-steel framework as necessary to complete the Work.

B. General: Provide steel framing and supports indicated and as necessary to complete the Work.

C. Fabricate units from structural-steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

D. Galvanize miscellaneous framing and supports where indicated.

2.11 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.12 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123, for galvanizing steel and iron products.
2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
SECTION 05500 - METAL FABRICATIONS

C. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

E. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings, if any.

1. Support steel beams on solid grouted masonry, concrete, or on existing structural steel.

3.3 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
SECTION 05500 - METAL FABRICATIONS

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 Section "Painting."

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05500
SECTION 05511 - METAL STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preassembled steel stairs with concrete-filled and abrasive-coating-finished formed-metal treads.
2. Steel tube railings attached to metal stairs.
3. Steel tube handrails attached to walls adjacent to metal stairs.

B. See Division 5 Section "Pipe and Tube Railings" for pipe and tube railings not attached to metal stairs or to walls adjacent to metal stairs.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design metal stairs, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

1. Uniform Load: 100 lbf/sq. ft.
2. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch whichever is less.

C. Structural Performance of Railings: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.

1. Handrails and Top Rails of Guards:
   a. Uniform load of 50 lbf/ft. applied in any direction.
   b. Concentrated load of 200 lbf applied in any direction.
   c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:
   a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
   b. Infill load and other loads need not be assumed to act concurrently.

D. Seismic Performance: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Component Importance Factor is 1.5.
SECTION 05511 - METAL STAIRS

1.3 SUBMITTALS

A. Product Data: For metal stairs.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 QUALITY ASSURANCE

A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

1. Preassembled Stairs: Commercial Service class.
2. Industrial-Type Stairs: Industrial class.

PART 2 - PRODUCTS

2.1 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Steel Tubing: ASTM A 500 (cold formed) or ASTM A 513.

D. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

E. Steel Bars for Grating Treads: ASTM A 36/A 36M or steel strip, ASTM A 1011/A 1011M or ASTM A 1018/A 1018M.

F. Wire Rod for Grating Crossbars: ASTM A 510

G. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

H. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, either commercial steel, Type B, or structural steel, Grade 25, unless another grade is required by design loads; exposed.

I. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, either commercial steel, Type B or structural steel, Grade 30, unless another grade is required by design loads.

J. Expanded-Metal, Carbon Steel: ASTM F 1267, Type I (expanded), Class 1 (uncoated).
SECTION 05511 - METAL STAIRS

1. Style Designation: 1-1/2 number 10


2.2 MISCELLANEOUS MATERIALS

A. Cast-Metal Units: Cast iron, with an integral abrasive, as-cast finish.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the
      following available manufacturers offering products that may be incorporated into the
      Work include, but are not limited to, the following or approved equal:
      a. American Safety Tread Co., Inc.
      b. Balco Inc.
      c. Barry Pattern & Foundry Co., Inc.
      d. Granite State Casting Co.
      e. Safe-T-Metal Company, Inc.
      f. Wooster Products Inc.
      g. Or Approved Equal

B. Extruded Units: Aluminum units with abrasive filler in an epoxy-resin binder.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the
      following available manufacturers offering products that may be incorporated into the
      Work include, but are not limited to, the following or approved equal:
      a. ACL Industries, Inc.
      b. American Safety Tread Co., Inc.
      c. Amstep Products.
      d. Armstrong Products, Inc.
      e. Balco Inc.
      f. Granite State Casting Co.
      g. Wooster Products Inc.
      h. Or Approved Equal

2. Provide ribbed units, with abrasive filler strips projecting 1/16 inch above aluminum
   extrusion.

3. Provide solid-abrasive-type units without ribs.

C. Provide anchors for embedding units in concrete, either integral or applied to units, as standard
   with manufacturer.

D. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.

E. Apply clear lacquer to concealed surfaces of extruded units set into concrete.

F. Fasteners: Provide zinc-plated fasteners with coating complying with ASTM B 633 or
   ASTM F 1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior
   walls. Select fasteners for type, grade, and class required.
SECTION 05511 - METAL STAIRS

G. Shop Primers: Provide primers that comply with Division 9 Section "High-Performance Coatings."

H. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

I. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

J. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

K. Welded Wire Fabric: ASTM A 185/A 185M, 6 by 6 inches, 0.1 by 0.1, unless otherwise indicated.

L. Precast Concrete Treads: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, ready-mixed concrete with a minimum 28-day compressive strength of 5000 psi and a total air content of not less than 4 percent or more than 6 percent. Reinforce with galvanized, welded wire fabric, 2 by 2 inches by 0.062-inch diameter wire; comply with ASTM A 185/A 185M and ASTM A 82/A 82M, except for minimum wire size.

2.3 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding unless otherwise indicated.
2. Use connections that maintain structural value of joined pieces.
3. Fabricate treads and platforms of exterior stairs so finished walking surfaces slope to drain.
4. Provide filler plate steel to close off any gaps at stringers or openings.

B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without impairing work.

E. Weld connections to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Weld exposed corners and seams continuously unless otherwise indicated.
5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 4 welds: good quality, uniform undressed weld with minimal splatter.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.

G. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.4 STEEL-FRAMED STAIRS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following or approved equal:

1. Alfab, Inc.
2. American Stair, Inc.
3. Sharon Companies Ltd. (The).
4. Or Approved Equal

B. Stair Framing:

1. Fabricate stringers of steel channels.
2. Construct platforms of steel plate headers and miscellaneous framing members as needed to comply with performance requirements.
3. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
4. Where stairs are enclosed by gypsum board shaft-wall assemblies, provide hanger rods or struts to support landings from floor construction above or below.
5. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

C. Metal-Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.067 inch.

1. At Contractor's option, provide stair assemblies with metal-pan subtreads filled with reinforced concrete during fabrication.
2. Provide epoxy-resin-filled treads, reinforced with glass fibers, with slip-resistant, abrasive surface.

D. Abrasive-Coating-Finished, Formed-Metal Stairs: Form risers, treads, and platforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.097 inch. Finish tread and platform surfaces with manufacturer's standard epoxy-bonded abrasive finish.

E. Metal Floor Plate Stairs: Form treads and platforms to configurations shown from rolled-steel floor plate of thickness needed to comply with performance requirements, but not less than 1/8 inch. Form treads with integral nosing and back edge stiffener. Weld steel supporting brackets to stringers and weld treads to brackets.
SECTION 05511 - METAL STAIRS

2.5 STAIR RAILINGS

A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: 1-5/8-inch- diameter
2. Picket Infill: 1/2-inch- square pickets spaced less than 4 inches clear.
3. Expanded-Metal Infill: Expanded-metal panels with long dimension of diamonds as indicated on Drawings.
4. Perforated-Metal Infill: Perforated-metal panels with pattern as indicated on Drawings.
5. Mesh Infill: Woven wire mesh in steel channel frames as indicated on Drawings.

B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" Type 4 welds: good quality, uniform undressed weld with minimal splatter.

C. Form changes in direction of railings by bending or by inserting prefabricated elbow fittings.

D. Form curves by bending members in jigs to produce uniform curvature without buckling.

E. Close exposed ends of railing members with prefabricated end fittings.

F. Provide wall returns at ends of wall-mounted handrails.

G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.

1. Connect posts to stair framing by direct welding.

H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, to transfer wall bracket loads through wall finishes. Size fillers to suit wall finish thicknesses.

2.6 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal stairs after assembly.

C. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

D. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with [SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning] [SSPC-SP 3, "Power Tool Cleaning]."
SECTION 05511 - METAL STAIRS


PART 3 - EXECUTION

3.1 INSTALLATION

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

B. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.

C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication.

D. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

E. Place and finish concrete fill for treads and platforms to comply with Division 3 Section "Cast-in-Place Concrete."

1. Install abrasive nosings with anchors fully embedded in concrete.

F. Install precast concrete treads with adhesive supplied by manufacturer.

G. Attach handrails to wall with wall brackets. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

3.2 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 05511
SECTION 05521 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following as indicated on the drawings:

1. Galvanized steel pipe and tube handrails and railings. (For all exterior work.)
2. Stainless-steel pipe and tube handrails and railings.
3. Steel pipe and tube handrails and railings.

1.3 PERFORMANCE REQUIREMENTS

A. General: In engineering handrails and railings to withstand structural loads indicated, determine allowable design working stresses of handrail and raling materials based on the following:

1. Stainless Steel: ASCE 8, "Specification for the Design of Cold-Formed Stainless Steel Structural Members."
3. Cold-Formed Structural Steel: AISI SG-673, Part I, "Specification for the Design of Cold-Formed Steel Structural Members."

B. Structural Performance of Handrails and Railings: Provide handrails and railings complying with requirements of ASTM E 985 for structural performance, based on testing performed according to ASTM E 894 and ASTM E 935.

C. Structural Performance of Handrails and Railings: Provide handrails and railings capable of withstanding the following structural loads without exceeding allowable design working stresses of materials for handrails, railings, anchors, and connections:

1. Top Rail of Guards: Capable of withstanding the following loads applied as indicated:
   a. Concentrated load of 200 lbf applied at any point and in any direction.
   b. Uniform load of 50 lbf/ft. applied horizontally and concurrently with uniform load of 100 lbf/ft. applied vertically downward.
   c. Concentrated and uniform loads above need not be assumed to act concurrently.

2. Handrails Not Serving As Top Rails: Capable of withstanding the following loads applied as indicated:
   a. Concentrated load of 200 lbf applied at any point and in any direction.
SECTION 05521 - PIPE AND TUBE RAILINGS

b. Uniform load of 50 lbf/ft. applied in any direction.

c. Concentrated and uniform loads above need not be assumed to act concurrently.

3. Infill Area of Guards: Capable of withstanding a horizontal concentrated load of 200 lbf applied to 1 sq. ft. at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area.

   a. Load above need not be assumed to act concurrently with loads on top rails in determining stress on guard.

D. Thermal Movements: Provide handrails and railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 SUBMITTALS

A. Product Data: For the following:

   1. Manufacturer's product lines of mechanically connected handrails and railings.
   2. Grout, anchoring cement, and paint products.

B. Shop Drawings: Show fabrication and installation of handrails and railings. Include plans, elevations, sections, component details, and attachments to other Work.

   1. Provide structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation for all handrails and railings compliant with the current Code (IBC 2015 NJ Edition).

C. Samples for Initial Selection: Short sections of railing or flat, sheet metal samples showing available mechanical finishes.

D. Provide samples as requested by the Owner for each type of railing, handrails and handrail brackets to the post.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. Product Test Reports: From a qualified testing agency indicating handrails and railings comply with ASTM E 985, based on comprehensive testing of current products.
SECTION 05521 - PIPE AND TUBE RAILINGS

1.5 QUALITY ASSURANCE

A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in New Jersey and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of handrails and railings that are similar to those indicated for this Project in material, design, and extent.

B. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

C. Source Limitations: Obtain each type of handrail and railing through one source from a single manufacturer.

1.6 STORAGE

A. Store handrails and railings in a dry, well-ventilated, weathertight place.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating handrails and railings without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

A. Coordinate installation of anchorages for handrails and railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.9 SCHEDULING

A. Schedule installation so handrails and railings are mounted only on completed walls. Do not support temporarily by any means that does not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
SECTION 05521 - PIPE AND TUBE RAILINGS

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 or approved equal:

1. Steel and Stainless-Steel Pipe and Tube Railings:
   a. High Point Architectural Metal.
   b. Architectural Art Mfg., Inc.
   c. Blum: Julius Blum & Co., Inc.
   d. Approved equal.

2.2 METALS

A. General: Provide metal free from pitting, seam marks, roller marks, stains, discolorations, and other imperfections where exposed to view on finished units.

B. Stainless Steel: Grade or type designated below for each form required: Provide all pipes, tubing, castings and plate stainless steel from type 304 stainless for interior railings and type 316 for exterior railings.

C. Steel and Iron: Provide steel and iron in the form indicated, complying with the following requirements:

1. Steel Pipe: ASTM A 53; finish, type, and weight class as follows:
   a. Black finish, unless otherwise indicated.
   b. Galvanized finish for exterior installations and where indicated.
   c. Type F, or Type S, Grade A, standard weight (Schedule 40), unless another grade and weight are required by structural loads.

2. Steel Tubing: Cold-formed steel tubing, ASTM A 500, Grade A, unless another grade is required by structural loads.

3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

4. Iron Castings: Malleable iron complying with ASTM A 47, Grade 32510.


D. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.3 WELDING MATERIALS, FASTENERS, AND ANCHORS

A. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

B. Fasteners for Anchoring Handrails and Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring handrails and railings to other types of construction indicated and capable of withstanding design loads.

1. For stainless-steel handrails and railings, use fasteners fabricated from Type 304 stainless steel for interior work and Type 316 stainless steel for exterior work.
2. For steel handrails, railings, and fittings, use plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodedeposited zinc coating.

C. Fasteners for Interconnecting Handrail and Railing Components: Use fasteners fabricated from same basic metal as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.

1. Provide concealed fasteners for interconnecting handrail and railing components and for attaching them to other work, unless otherwise indicated.
2. Provide Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.

D. Cast-in-Place and Postinstalled Anchors: Anchors of type indicated below, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

2. Chemical anchors.
3. Expansion anchors.

2.4 PAINT

A. Shop Primers: Provide primers to comply with applicable requirements in Division 9 Section "Painting."

B. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

C. Shop Primer for Galvanized Steel: Zinc-dust, zinc-oxide primer formulated for priming zinc-coated steel and for compatibility with finish paint systems indicated, and complying with SSPC-Paint 5.

2.5 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

B. Interior Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Use for interior applications only.
SECTION 05521 - PIPE AND TUBE RAILINGS

C. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.6 FABRICATION

A. General: Fabricate handrails and railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Assemble handrails and railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Form changes in direction of railing members as follows:

1. As detailed.
2. By bending.
3. By radius bends of radius indicated.
4. By flush radius bends.
5. By mitering at elbow bends.
6. By inserting prefabricated flush-elbow fittings.
7. By any method indicated above as detailed in the drawings, applicable to change in direction involved.

D. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

E. Welded Connections: Fabricate handrails and railings for connecting members by welding. Cope components at perpendicular and skew connections to provide close fit, or use fittings designed for this purpose. Weld connections continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

F. Nonwelded Connections: Fabricate handrails and railings by connecting members with concealed mechanical fasteners and fittings, unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
SECTION 05521 - PIPE AND TUBE RAILINGS

1. Fabricate splice joints for field connection using an epoxy structural adhesive where this is manufacturer's standard splicing method.

G. Welded Connections for Aluminum Pipe: Fabricate pipe handrails and railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.

H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect handrail and railing members to other work, unless otherwise indicated.

I. Provide inserts and other anchorage devices for connecting handrails and railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by handrails and railings. Coordinate anchorage devices with supporting structure.

J. For railing posts set in concrete, provide preset sleeves of steel not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, and steel plate forming bottom closure.

K. For removable railing posts, fabricate slip-fit sockets from steel tube whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-hundredth of post height. Provide socket covers designed and fabricated to resist being dislodged.

1. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

L. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.

M. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.

N. Cut, reinforce, drill, and tap components, as indicated, to receive finish hardware, screws, and similar items.

O. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members that are exposed to exterior or to moisture from condensation or other sources.

P. Fabricate joints that will be exposed to weather in a watertight manner.

Q. Close exposed ends of handrail and railing members with prefabricated end fittings.

R. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns, unless clearance between end of railing and wall is 1/4 inch or less.

S. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.
SECTION 05521 - PIPE AND TUBE RAILINGS

T. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.7 FINISHES, GENERAL

A. Comply with NAAMM’s "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Provide exposed fasteners with finish matching appearance, including color and texture, of handrails and railings.

2.8 STAINLESS-STEEL FINISHES

A. Remove or blend tool and die marks and stretch lines into finish.

B. Grind and polish surfaces to produce uniform, directionally textured polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

C. 180-Grit Polished Finish: Oil-ground, uniform, textured finish.

D. 320-Grit Polished Finish: Oil-ground, uniform, smooth finish.

E. Polished and Buffed Finish: Oil-ground, 180-grit finish followed by buffing.

F. Bright, Directional Polish: No. 4 finish.

G. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2.9 STEEL FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A 123, for galvanizing steel and iron products.
2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
SECTION 05521 - PIPE AND TUBE RAILINGS

B. Fill vent and drain holes that will be exposed in finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

C. For galvanized handrails and railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

D. For non-galvanized steel handrails and railings, provide non-galvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.

E. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed handrails and railings:

1. Exteriors (SSPC Zone 1B): SSPC-SP 6, "Commercial Blast Cleaning."
2. Interiors (SSPC Zone 1A): SSPC-SP 7, "Brush-off Blast Cleaning."

F. Apply shop primer to prepared surfaces of handrail and railing components, unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Do not apply primer to galvanized surfaces.
2. Stripe paint edges, corners, crevices, bolts, and welds.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required to install handrails and railings. Set handrails and railings accurately in location, alignment, and elevation; measured from established lines and levels and free from rack.

1. Do not weld, cut, or abrade surfaces of handrail and railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
3. Align rails so variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
C. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

D. Adjust handrails and railings before anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated, but not less than that required by structural loads.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing handrails and railings and for properly transferring loads to inplace construction.

3.3 RAILING CONNECTIONS

A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of handrails and railings.

B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with the following anchoring material, mixed and placed to comply with anchoring material manufacturer's written instructions:

B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with the following anchoring material, mixed and placed to comply with anchoring material manufacturer's written instructions:

1. Nonshrink, nonmetallic grout.
2. Nonshrink, nonmetallic grout or anchoring cement.

C. Cover anchorage joint with flange of same metal as post, attached to post as follows:

1. Welded to post after placing anchoring material.
2. By set screws.

D. Leave anchorage joint exposed; wipe off surplus anchoring material; and leave 1/8-inch build-up, sloped away from post.
SECTION 05521 - PIPE AND TUBE RAILINGS

E. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
   1. For stainless-steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.
   2. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

F. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 ANCHORING RAILING-ENDS

A. Anchor railing ends into concrete and masonry with round flanges connected to railing ends and anchored into wall construction with postinstalled anchors and bolts.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces.
   1. Weld flanges to railing ends.
   2. Connect flanges to railing ends using nonwelded connections.

3.6 ATTACHING HANDBRAILS TO WALLS

A. Attach handrails to wall with manufactured machined wall brackets. Provide bracket with 1-1/2-inch clearance from inside face of handrail and finished wall surface.

B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

C. Secure wall brackets to building construction as follows:
   1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
   2. For hollow masonry anchorage, use toggle bolts.
   3. For wood stud partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with carpentry work to locate backing members.
   4. For steel-framed gypsum board assemblies, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
   5. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.

3.7 CLEANING

A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material.
C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 Section "Painting."

D. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.8 PROTECTION

A. Protect finishes of handrails and railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at the time of Substantial Completion.

B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05521
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the Plastic Fabrication as shown and specified in the described system(s):
   1. Door Lights
   2. Partitions
   3. Side lights

1.3 SUBMITTALS

A. General: Submit the following in accordance with conditions of contact and Division 1 Specification Section 01300 - Submittals.

B. Product Data: Submit manufacturer's product data; include product description, fabrication information, and compliance with specified performance requirements.

C. Submit product test reports from a qualified independent 3rd party testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed test reports will be acceptable if for current manufacturer and indicative of products used on this project.
   1. Test reports required are:
      a. Rate of Burning (ASTM D 635)
      b. Self-Ignition Temperature (ASTM D 1929)
      c. Density of Smoke (ASTM D 2843)
      d. Flame spread and Smoke developed testing (ASTM E 84)
      e. Room Corner Burn Test (NFPA 286)
      f. Extent of Burning (UL 94)
      g. Impact strength (ASTM D 3763)
      h. Safety glazing impact resistance (ANSI Z97.1-2004)
      i. UPITT Test for Combustion Product Toxicity
      j. Dynamic environmental testing (ASTM standards D 5116 and D 6670)

D. Building Approvals: Plastic Fabrications are to have been evaluated and must be registered with and comply to requirements of the following jurisdictions:
   1. New York Department of Buildings (Product must have an MEA [Materials and Equipment Acceptance] number) for use as Interior Finishes
   2. Los Angeles Department of Building and Safety (Product must have a LARR [Los Angeles Research Report] number) for use as Light-transmitting Panels

E. Shop Drawings: Include plans, elevations, sections, panel dimensions, details, and attachments to other work.
F. Samples for Initial Selection:
   1. Submit minimum 2-inch by 2-inch samples. Indicate full color, texture and
      pattern variation.

G. Samples for Verification:
   1. Submit minimum 4-inch by 4-inch sample for each type, texture, pattern and
      color of solid plastic fabrication.

H. Mockups:
   1. Build mockups to verify selections made under sample Submittals and to
      demonstrate aesthetic effects.
   2. Build mockup of Plastic Fabrication.
   3. Approved mockups may become part of the completed Work if undisturbed at
      time of Substantial Completion.

I. Maintenance Data: Submit manufacturer’s care and maintenance data, including care,
   repair and cleaning instructions. Include in Project closeout documents.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications
   1. Materials and systems shall be manufactured by a company continuously and
      regularly employed in the manufacture of specified materials for a period of at
      least five (5) consecutive years and which can show evidence of those materials
      being satisfactorily used on at least six (6) projects of similar size, scope and
      location. At least three (3) of the projects shall have been successful for use five
      (5) years or longer.
   2. Manufactured panels must be produced from a minimum of 40% post-industrial
      recycle content. This recycle content must be certified by a recognized 3rd party
      certification group, such as Scientific Certification Systems (SCS).
   3. Manufacturer must offer a documented reclaim process that will take back, at
      the manufacturers cost, panels that are at their end-of life cycle. Return process
      is preceded by following requirements highlighted in Section 01524 –
      Construction Waste Management.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver Plastic Fabrications, systems and specified items in manufacturer’s standard
   protective packaging.

B. Do not deliver Plastic Fabrications, system, components and accessories to Project site
   until areas are ready for installation.

C. Store materials in a flat orientation in a dry place that is not exposed to exterior
   elements.

D. Handle materials to prevent damage to finished surfaces. Provide protective coverings
   to prevent damage or staining following installation for duration of project.

E. Before installing Plastic Fabrications, permit them to reach room temperature.

1.6 PROJECT CONDITIONS
SECTION 06066 - TRANSLUCENT RESIN PANEL SYSTEM

A. Environmental Limitations: Do not install Solid Polymer Fabrications until spaces are enclosed and weatherproof, and ambient temperatures and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 WARRANTY

A. Manufacturer's Special Warranty on Plastic Fabrications: Manufacturer's standard form agreeing to repair or replace units that fail in material or workmanship within the specified warranty period.

B. Warranty Period: 2 year after the date of substantial completion.

C. The warranty shall not deprive the owner of other rights or remedies the Owner may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: 3form, Inc., Salt Lake City, Utah, USA / telephone 801-649-2500 or approved equal.

2.2 MATERIALS

A. Varia™ (or approved equal) produced from ecoresin™ (or approved equal) Sheet

   1. Engineered polyester resin
   2. Sheet Size: Maximum 4' x 10'
   3. Thickness: Minimum 1/16”
   4. Basis of Design Product: The design of Plastic Fabrications is based on Varia™ produced with ecoresin™ as provided by 3form, Inc. Substitutions will be considered in accordance with Section 01300 – Submittals.

B. Interlayer Materials: Compatible with polyesters and bonding process to create a monolithic sheet of material when complete.

C. Sheet minimum performance attributes:

   1. Rate of Burning (ASTM D 635). Material must attain CC1 Rating for a nominal thickness of 1.5 mm (0.060 in.) and greater.
   2. Self-Ignition Temperature (ASTM D 1929). Material must have a Self-ignition temperature greater than 650°F.
   3. Density of Smoke (ASTM D 2843). Material must have a smoke density less than 75%.
   4. Flame spread and Smoke developed testing (ASTM E 84). Material must be able to meet a level of Class A (Flame spread less than 25 and smoke less than 450) at thickness of 1”.
   5. Room Corner Burn Test (NFPA 286). Material must meet Class A criteria at 1/4” thickness as described by the 2003 International Building Code.

9. UPITT Test for Combustion Product Toxicity: Product must be recorded as "not more toxic than wood".

10. Dynamic environmental testing (ASTM standards D 5116 and D 6670). Panels must not have detectable VOC off-gassing agents and must be have Greenguard™ Indoor Air Quality certified.

11. Panels must be produced from a minimum of 40% post-industrial recycle content. This recycle content must be certified by a recognized 3rd party certification group, such as Scientific Certification Systems (SCS).

12. Building Approvals: Plastic Fabrications are to have been evaluated and must be registered with and comply to requirements of the following jurisdictions:

   a. New York Department of Buildings (Product must have an MEA [Materials and Equipment Acceptance] number for use as Interior Finishes
   b. Los Angeles Department of Building and Safety (Product must have a LARR [Los Angeles Research Report] number for use as Light-transmitting Panels

2.3 FABRICATION

A. General: Fabricate Plastic Fabrications to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes, profiles and other characteristics are indicated on the drawings.

B. Comply with manufacturer’s written recommendations for fabrication.

C. Machining: Acceptable means of machining are listed below. Ensure that material is not chipped or warped by machining operations.

1. Sawing: Select equipment and blades suitable for type of cut required.
2. Drilling: Drills specifically designed for use with plastic products.
4. Routing
5. Tapping

D. Forming: Form products to shapes indicated using the appropriate method listed below. Comply with manufacturer’s written instructions.

1. Cold Bending
2. Hot Bending
3. Thermoforming: Acceptable only on uncoated material.
4. Drape Forming
5. Matched Mold Forming
6. Mechanical Forming

E. Laminating: Laminate to substrates indicated using adhesives and techniques recommended by manufacturer.
2.4 MISCELLANEOUS MATERIALS

A. General: Provide products of material, size, and shape required for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaner: Type recommended by manufacturer.

C. Fasteners: Use screws designed specifically for plastics. Self-threading screws are acceptable for permanent installations. Provide threaded metal inserts for applications requiring frequent disassembly such as light fixtures.

D. Bonding Cements: May be achieved with solvents or adhesives, suitable for use with product and application.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where installation of Plastic Fabrications will occur, with Installer present, for compliance with manufacturer’s requirements. Verify that substrates and conditions are satisfactory for installation and comply with requirements specified.

3.2 INSTALLATION

A. General: Comply with manufacturer’s written instructions for the installation of Plastic Fabrications.

B. Manufacturer’s shop to fabricate items to the greatest degree possible.

C. Utilize fasteners, adhesives and bonding agents recommended by manufacturer for type of installation indicated. Material that is chipped, warped, hazed or discolored as a result of installation or fabrication methods will be rejected.

D. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.

E. Form field joints using manufacturer’s recommended procedures. Locate seams in panels so that they are not directly in line with seams in substrates.

3.3 CLEANING AND PROTECTION

A. Protect surfaces from damage until date of substantial completion. Repair work or replace damaged work, which cannot be repaired to Architect’s satisfaction.
PRODUCT DATA SHEETS: Basis of Design Product: The design of Plastic Fabrications is based on Varia™ produced with ecoresin™ as provided by 3form, Inc. Substitutions will be considered in accordance with Section 01300 – Submittals.

Solid Polymer Fabrication #1 (SPF-1)

Tag: ES-1
Product: Varia Ecoresin
Color: Thatch Linear
Gauge: ¼”
Surface Finish: F02 Patina on both sides
UV Protection: Not required
Edge Sealing: not required
Expansion/Contraction Allowance:
Orientation: Pattern direction parallel top 4 foot size.

Solid Polymer Fabrication #1 (SPF-1)

Tag: ES-2
Product: Varia Ecoresin
Color: Ensign, Linear
Gauge: ¼”
Surface Finish: Sandstone, FO1 both sides
UV Protection: Not required
Edge Sealing: not required
Expansion/Contraction Allowance:
Orientation: Pattern direction parallel top 4 foot size.
SECTION 06066 - TRANSLUCENT RESIN PANEL SYSTEM

Solid Polymer Fabrication #1 (SPF-1)

Tag: ES-3

Product: Varia Ecoresin
Color: Lina Grays - Linear
Gauge: ¼”
Surface Finish: F02 Patina on both sides
UV Protection: Not required
Edge Sealing: not required
Expansion/Contraction Allowance: 10%
Orientation: Pattern direction parallel top 4 foot size

END OF SECTION 06066
SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Framing with dimension lumber.
   2. Framing with engineered wood products.
   3. Wood furring, grounds, nailers, and blocking.
   4. Sheathing.
   5. Subflooring.

1.3 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise specified.

B. Exposed Framing: Dimension lumber not concealed by other construction and indicated to receive a stained or natural finish.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for the following products:
   1. Engineered wood products.
   2. Underlayment.
   3. Insulating sheathing.

C. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee's (ALSC) Board of Review.

D. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:
SECTION 06100 - ROUGH CARPENTRY

1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: To qualify for approval, an independent testing agency must demonstrate to Architect's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

B. Single-Source Responsibility for Engineered Wood Products: Obtain each type of engineered wood product from one source and by a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 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 or approved equal:

1. Wood-Preservative-Treated Materials:
   b. Chemical Specialties, Inc.
   c. Continental Wood Preservers, Inc.
   d. Osmose Wood Preserving, Inc.
   e. or approved equal

2. Laminated-Veneer Lumber:
   a. Alpine Structures.
   b. Georgia-Pacific Corp.
   d. or approved equal

3. Prefabricated Wood I-Joists:
   b. Alpine Structures.
   c. Georgia-Pacific Corp.
SECTION 06100 - ROUGH CARPENTRY

d. or approved equal

4. Gypsum Sheathing Board:
   a. Georgia-Pacific Corp.
   c. United States Gypsum Co.
   d. or approved equal

2.2 LUMBER, GENERAL


B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
   1. NELMA - Northeastern Lumber Manufacturers Association.
   2. NLGA - National Lumber Grades Authority (Canadian).
   3. RIS - Redwood Inspection Service.
   4. SPIB - Southern Pine Inspection Bureau.
   5. WCLIB - West Coast Lumber Inspection Bureau.
   6. WWPA - Western Wood Products Association.

C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

D. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
   1. Provide dressed lumber, S4S, unless otherwise indicated.
   2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.

B. Pressure treat wood members in contact with ground or freshwater with waterborne preservatives to a minimum retention of 0.40 lb/cu. ft. (6.4 kg/cu. m).

C. All preservative treated materials should all be secured by stainless steel screws or fasteners with isolated material to all metal members.
SECTION 06100 - ROUGH CARPENTRY

2.4 DIMENSION LUMBER

A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

B. Non-Load-Bearing Interior Partitions: Provide framing of the following grade and species:

1. Grade: No. 2.
2. Species: Eastern softwoods; NELMA.
3. Species: Northern species; NLGA.
4. Species: Mixed southern pine; SPIB.
5. Species: Western woods; WCLIB or WWPA.

C. Exterior and Load-Bearing Walls: Provide framing of the following grade and species:

D. Framing Other than Non-Load-Bearing Partitions: Provide framing of the following grade and species:

1. Grade: No. 2.
2. Species: Spruce-pine-fir south; NELMA.
3. Species: Hem-fir north; NLGA.
4. Species: Spruce-pine-fir north; NLGA.
5. Species: Mixed southern pine; SPIB.
6. Species: Hem-fir; WCLIB or WWPA.
7. Species: Any species above.

2.5 BOARDS

A. Exposed Boards: Where boards will be exposed in the finished work, provide the following:

1. Moisture Content: 19 percent maximum.
2. Species and Grade: Spruce-pine-fir, C & Btr per WCLIB rules or C Select per NLGA or WWPA rules.
3. As noted on plans by Architect.

B. Concealed Boards: Where boards will be concealed by other work, provide lumber with 19 percent maximum moisture content and of following species and grade:

1. Species and Grade: Eastern softwoods, No. 3 Common per NELMA rules.
2. Species and Grade: Mixed southern pine, No. 2 per SPIB rules.
3. Species and Grade: Spruce-pine-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.
4. Species and Grade: Western woods, Standard per WCLIB rules or No. 3 Common per WWPA rules.
5. Species and Grade: Any species above.
2.6 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.

D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC’s NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.7 ENGINEERED WOOD PRODUCTS

A. General: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that evidence compliance with building code in effect for Project.

1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Laminated-Veneer Lumber: Lumber manufactured by laminating wood veneers in a continuous press using an exterior-type adhesive complying with ASTM D 2559 to produce members with grain of veneers parallel to their lengths and complying with the following requirements:

1. Extreme Fiber Stress in Bending: 2500 psi (17 MPa) for 12-inch nominal- (286-mm actual-) depth members.
2. Modulus of Elasticity: 2,000,000 psi (13 800 MPa).
3. Tension Parallel to Grain: 1850 psi (13 MPa).
5. Compression Perpendicular to Grain: 400 psi (3 MPa) perpendicular to and 500 psi (3.5 MPa) and parallel to glue line.
6. Horizontal Shear: 285 psi (2 MPa) perpendicular to and 190 psi (1.3 MPa) parallel to glue line.

C. Prefabricated Wood I-Joists: Units manufactured by bonding stress-graded lumber flanges to wood-based structural-use panel webs with exterior-type adhesives complying with ASTM D 2559, to produce I-shaped joists complying with the following requirements:

1. Flange Material: Laminated-veneer lumber.
2. Web Material: Oriented-strand board (OSB) complying with DOC PS 2.
4. Web Material: Either material indicated above, as standard with joist manufacturer.
5. Structural Capacities: Establish and monitor structural capacities according to ASTM D 5055.
6. Sizes: Depths and widths as indicated, with flanges not less than 1-1/2 inches (38 mm) in actual width.
7. I-Joists shall be installed with all required anchors, stiffeners and bracing in accordance with manufacturer requirements.

2.8 CONCEALED, PERFORMANCE-RATED STRUCTURAL-USE PANELS

A. General: Where structural-use panels are indicated for the following concealed types of applications, provide APA-performance-rated panels complying with requirements designated under each application for grade, span rating, exposure durability classification, and edge detail (where applicable).

1. Thickness: Provide panels meeting requirements specified but not less than thickness indicated.

B. Subflooring: APA-rated sheathing.
1. Exposure Durability Classification: Exposure 1.
4. Floor sheathing shall be tongue and groove and installed with both construction adhesive and required nailing.

C. Wall Sheathing: APA-rated sheathing.
1. Exposure Durability Classification: Exposure 1.
2. Span Rating: As required to suit stud spacing indicated.
3. Minimum thickness indicated on plan.

D. Roof Sheathing: APA-rated sheathing.
4. Roof sheathing shall be installed with panel clips.

2.9 STRUCTURAL-USE PANELS FOR BACKING

A. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant-treated plywood panels with grade, C-D Plugged Exposure 1, in thickness indicated or, if not otherwise indicated, not less than 15/32 inch (11.9 mm) thick.
2.10 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure treated lumber or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.


C. Power-Driven Fasteners: CABO NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M)

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

G. All fasteners to secure pressure treated lumber/plywood shall be Type 304 Stainless Steel.

2.11 METAL FRAMING ANCHORS

A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated and as follows:

1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with building code in effect for Project.

2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G60 (ASTM A 653M, Z180) coating designation; structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.

C. Joist Hangers: U-shaped joist hangers with 2-inch- (50-mm-) long seat and 1-1/4-inch- (32-mm-) wide nailing flanges at least 85 percent of joist depth.

1. Thickness: 0.064 inch (1.6 mm).

D. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
SECTION 06100 - ROUGH CARPENTRY

1. Strap Width: 2 inches (50 mm).
2. Thickness: 0.064 inch (1.6 mm).

E. Bridging: Rigid, V-section, nailless type, 0.064 inch (1.6 mm) thick, length to suit joist size and spacing.

F. Rafter Tie-Downs (Hurricane Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-5/8 inches (41 mm) wide by 0.052 inch (1.3 mm) thick minimum. Tie-Downs must be selected to meet uplift forces as calculated in the wood truss design.

2.12 THERMO-PLY SHEATHING

A. Standard Grade – Green, 0.78” for use in attic to secure under truss rafter for supporting glass fiber insulation board.

B. Pre-cut to 24” wide strip for easy field installation.

C. Perm Rating: Minimum 0.63.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.

C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.


2. Roof sheathing shall be installed with 1/8” spacing at all edge and end joints for expansion per APA recommendations in above-referenced guide.

F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. CABO NER-272 for power-driven staples, P-nails, and allied fasteners.
2. Published requirements of metal framing anchor manufacturer.

G. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

H. Use double hot-dip galvanized or stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.

I. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.2 WOOD FRAMING, GENERAL


B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Install framing members of size and at spacing indicated.

D. Do not splice structural members between supports.

E. Firestop concealed spaces of wood-framed walls and partitions at each floor level and at ceiling line of top story. Where firestopping is not inherent in framing system used, provide closely fitted wood blocks of 2-inch nominal- (38-mm actual-) thickness lumber of same width as framing members.

3.3 THERMO-PLY SHEATHING:

A. Provide conceal envelope in attic to support board insulation and to act as a vapor barrier.

B. Pre-cut 24" wide strip to secure under wood truss rafter. Cut edge to clear truss web member.

C. Tape joint between rafter without wood backing.

END OF SECTION 06100
1.1 GENERAL

A. Interior architectural woodwork includes all interior wood work, cabinets, casework, shelves, counters wood furring, blocking, shims, and hanging strips unless concealed within other construction prior to woodwork installation.

B. Submittals: In addition to product data, submit the following:

1. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
2. Samples of lumber and panel products for each species and cut indicated for transparent finish, and each material indicated for opaque finish, with one-half of exposed surfaces finished.
3. Samples of laminate-clad panel products, for each type, color, pattern, and surface finish.
4. Samples of thermoset decorative-overlay surfaced panel products, for each type, color, pattern, and surface finish.
5. Samples of solid surfacing materials.


D. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet-work is completed, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.2 PRODUCTS

A. Woodwork Fabricators: Subject to compliance with requirements, provide interior architectural woodwork by one of the following:

B. Panel Products: As follows:


C. High-Pressure Decorative Laminate: NEMA LD 3.

1. PL-1: Amber Cherry - #7919K-78 by Wilsonart or approved equal.

D. Thermoset Decorative Overlay: Decorative surface of thermally fused polyester or melamine-impregnated web, bonded to specified substrate and complying with ALA 1992.
SECTION 06402 - INTERIOR ARCHITECTURAL WOODWORK

E. Fire-Retardant-Treated Materials: Where indicated, use materials pressure impregnated with Exterior or Interior Type A fire-retardant chemical to comply with AWPA C20. Kiln-dry material after treatment. Discard material that does not comply with referenced woodworking standard.

F. Fire-Retardant Particleboard: Panels made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame spread of 25 or less and smoke developed of 25 or less per ASTM E 84.

G. Cabinet Hardware: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section "Door Hardware."

1. Cabinet Hardware Schedule: Match hardware used in manufacturer made units. See Specification Section 08710.

2. Hardware Standard: Comply with BHMA A156.9 for items indicated by reference to BHMA numbers or referenced to this standard.

3. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA code number indicated.
   a. Chromium Wire Brushed: BHMA 626 for brass or bronze base; BHMA 652 for steel base.

4. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of BHMA A156.9.

H. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.

I. Fabrication, General: Complete fabrication, including assembly and finishing, before shipment to Project site to maximum extent possible. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Backout or groove backs of flat trim members, kerf backs of other wide, flat members, except for members with ends exposed in finished work.

2. Assemble casings in plant except where limitations of access to place of installation require field assembly.

3. Shop-cut openings, to maximum extent possible. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges with a water-resistant coating.

J. Laminate-Clad Cabinets (Plastic-Covered Casework): As follows:

1. AWI Type of Cabinet Construction: Flush overlay.

2. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
   a. Horizontal Surfaces Other than Tops: GP-50, 0.050-inch (1.270-mm) nominal thickness.
   b. Vertical Surfaces: GP-50, 0.050-inch (1.270-mm) nominal thickness.
   c. Edges: Same thickness matching laminate in color, pattern, and finish to vertical and horizontal surfaces.
3. Materials for Semi-exposed Surfaces: Provide surface materials indicated below:
   b. PL-1: Amber Cherry - #7919K-78 by Wilsonart or approved equal.

4. Colors, Patterns, and Finishes: Provide colors and textures of laminate surfaces complying with the following:
   a. Laminate Surface: PL-1 – Amber Cherry - #7919K-78 by Wilsonart or approved equal.
   b. Match manufacturer's made furniture unit in the same room.
   c. Match color, pattern, and finish indicated by reference to laminate manufacturer's standard designations.
   d. Provide Architect's selections from laminate manufacturer's full range of colors and finishes.

5. Provide dust panels of ¼-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers except where located directly under tops.

K. Countertops: As follows:

1. Type of Top: Solid Surface as follows:
   a. Grade: GP-50, 0.050-inch (1.270-mm) nominal thickness
   b. Colors, Patterns, and Finishes: Provide colors and textures of laminate surfaces complying with the following
      1) Match manufacturer’s made furniture unit in the same room from the laminate manufacturer’s standard
   c. Edge treatment: Solid hardwood matching the wood furniture in the same room or PVC mold edge as noted on the drawings for construction and details.
   d. SS-2 – Granite Mocha #719-A by Meganite or approved equal.

2. Countertop High-Pressure Plastic Laminate: As indicated on the drawings.
   a. High-pressure plastic laminate, textured finish .048 inch (1.22 mm) thickness or .042 inch (1.07 mm) postforming grade as detailed. Color as selected from manufacturer's stock standard patterns and solid colors.
   b. Heavy gauge neutral colored backing sheet for balanced construction.
   c. PL-2 – Sandy Topaz #4862K-07 by Wilsonart or approved equal.

1.3 EXECUTION

A. Preparation: Condition woodwork to average prevailing humidity conditions in installation areas, and examine and complete work as required, including back priming and removal of packing, before installing.
B. Install woodwork to comply with AWI Section 1700 for the same grade specified above for type of woodwork involved.

1. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

2. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.

C. Standing and Running Trim: Install with minimum number of joints, using full-length pieces to the greatest extent possible. Stagger joints in adjacent and related members. Fill gaps, if any, between top of base and wall with plastic wood filler and sand smooth.

D. Tops: Anchor securely to base units. Seal space between backsplash and wall.

END OF SECTION 06402
SECTION 06650 – SOLID SURFACE FABRICATIONS

1.01 SUMMARY

A. Section Includes: Provide solid surfacing fabrications including but not limited to following:

1. Window sills.

B. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

1. Section 07920 - Joint Sealants.

1.02 REFERENCES

A. Definitions:

1. Solid Surface: Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

B. Reference Standards:

1. ASTM D638-10 - Standard Test Method for Tensile Properties of Plastics
2. ASTM D785-08 - Standard Test Method for Rockwell Hardness of Plastics
5. ASTM E84-14 - Standard Test Method for Surface Burning Characteristics of Building Materials
8. ASTM G22-76(96) - Standard Practice for Determining Resistance of Plastics to Bacteria

1.03 SUBMITTALS

A. Product Data: Indicate Product description including solid surface sheets, sinks, bowls and illustrating full range of standard colors, fabrication information and compliance with specified performance requirements. Submit Product data with resistance to list of chemicals.

B. Shop Drawings: Submit Shop Drawings for work of this Section in accordance with Section 01300. Indicate plans, sections, dimensions, component sizes, edge details, thermosetting requirements, fabrication details, attachment provisions, sizes of furring, blocking, including concealed blocking and coordination requirements with adjacent work. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacles and other items installed in solid surface.
SECTION 06650 – SOLID SURFACE FABRICATIONS

C. Samples: Submit samples in accordance with Section 01300. Submit minimum 6" x 6" samples. Cut sample and seam together for representation of inconspicuous seam. Indicate full range of color and pattern variation. Approved samples will be retained as standards for work.

1.04 QUALITY ASSURANCE

A. Qualifications:
   1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

B. Mock-Ups:
   1. Prior to final approval of Shop Drawings, erect 1 full size mock-up of each component at Project site demonstrating quality of materials and execution for Architect review.
   2. Should mock-up not be approved, rework or remake until approval is secured. Remove rejected units from Project site.
   3. Approved mock-up will be used as standard for acceptance of subsequent work.
   4. Approved mock-ups may remain as part of finished work.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements: Deliver no components to Project site until areas are ready for installation.

B. Storage and Handling Requirements:
   1. Store components indoors prior to installation.
   2. Handle materials to prevent damage to finished surfaces.

1.06 WARRANTY

A. Manufacturer Warranty: Provide manufacturer’s standard warranty for material only for period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Architect and at no expense to Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
   1. Meganite; www.meganite.com
   2. Corian® by DuPont; www.corian.com
   3. Samsung Chemical USA; www.staron.com
4. Wilsonart Contract; www.wilsonartcontract.com
5. Or Approved Equal

2.02 MATERIALS

A. Description: Provide solid surface window sills at all windows or as noted on the drawings.

B. Colors and Patterns: As selected by Architect from manufacturer's full range.

C. Performance/Design Criteria:

<table>
<thead>
<tr>
<th>Property</th>
<th>Requirement (min or max)</th>
<th>Test Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Surface Based Products:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Tensile Strength</td>
<td>6000 psi min</td>
<td>ASTM D638</td>
</tr>
<tr>
<td>b. Tensile Modulus</td>
<td>$1.5 \times 10^6$ psi min</td>
<td>ASTM D638</td>
</tr>
<tr>
<td>c. Tensile Elongation</td>
<td>0.4% min.</td>
<td>ASTM D638</td>
</tr>
<tr>
<td>d. Flexural Strength</td>
<td>10000 psi min</td>
<td>ASTM D790</td>
</tr>
<tr>
<td>e. Flexural Modulus</td>
<td>$1.2 \times 10^6$ psi min</td>
<td>ASTM D790</td>
</tr>
<tr>
<td>f. Hardness</td>
<td>&gt;85-Rockwell &quot;M&quot; scale min</td>
<td>ASTM D785</td>
</tr>
<tr>
<td>g. Thermal Expansion</td>
<td>$2.2 \times 10^{-4}$ in./in./°F</td>
<td>ASTM E228</td>
</tr>
<tr>
<td>h. Fungi and Bacteria</td>
<td>No microbial growth</td>
<td>ASTM G21 &amp; G22</td>
</tr>
<tr>
<td>i. Microbial Resistance</td>
<td>Highly resistant to mold growth</td>
<td>UL 2824</td>
</tr>
<tr>
<td>j. Ball Impact</td>
<td>No fracture - 1/2 lb. Ball:</td>
<td>ASTM G155</td>
</tr>
<tr>
<td></td>
<td>6 mm slab - 36&quot; drop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 mm slab - 144&quot; drop</td>
<td></td>
</tr>
<tr>
<td>k. Weatherability</td>
<td>$\Delta E*94&lt;5$ in 1,000 hrs</td>
<td></td>
</tr>
<tr>
<td>l. Flammability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. Flame Spread</td>
<td>$&lt;25$</td>
<td>$&lt;25$</td>
</tr>
<tr>
<td>n. Smoke Developed</td>
<td>$&lt;25$</td>
<td>$&lt;25$</td>
</tr>
<tr>
<td>o. Class Safety Code</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>NFPA 101®, Life</td>
<td></td>
</tr>
</tbody>
</table>

D. Solid Surface Material: Non-porous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment; not coated, laminated or of composite construction; meeting following criteria:

1. Flammability: Class 1 and A when tested to UL 723.

E. Adhesive for Bonding to Other Products: One component silicone to ASTM C920.
SECTION 06650 – SOLID SURFACE FABRICATIONS

F. Sealant: A standard mildew-resistant, FDA/UL® [and NSF/ANSI 51 compliant in Food Zone area.] recognized silicone color matched sealant or clear silicone sealants.

2.03 COMPONENTS

A. Window Sills: 1/2" thick solid surfacing material, adhesively joined with inconspicuous seams, edge details as indicated on Drawings. Color as selected by Architect from manufacturer’s full color range.

B. Fabrication:

1. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and solid polymer manufacturer requirements. Form joints between components using manufacturer’s standard joint adhesive without conspicuous joints. Provide factory cutouts for plumbing fittings and bath accessories as indicated on Drawings.

2. Where indicated, thermoform corners and edges or other objects to shapes and sizes indicated on Drawings, prior to seaming and joining. Cut components larger than finished dimensions and sand edges to remove nicks and scratches. Heat entire component uniformly prior to forming.

3. Ensure no blistering, whitening and cracking of components during forming.

4. Fabricate joints between components using manufacturer's standard joint adhesive. Ensure joints are inconspicuous in appearance and without voids. Attach 50 mm (2") wide reinforcing strip of solid polymer material under each joint. Reinforcing strip of solid polymer material is not required when using DuPont™ Joint Adhesive 2.0.

5. Rout and finish component edges to a smooth, uniform finish. Rout cutouts, then sand edges smooth. Repair or reject defective or inaccurate work.

6. Finish: Ensure surfaces have uniform finish:

a. Matte, with a 60° gloss rating of 5 - 20.

7. Fabrication Tolerances:

a. Variation in Component Size: +/-1/8".

b. Location of Openings: +/-1/8" from indicated location.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:

1. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.

2. Verify actual site dimensions and location of adjacent materials prior to commencing work.

3. Notify Architect in writing of any conditions which would be detrimental to installation.
SECTION 06650 – SOLID SURFACE FABRICATIONS

B. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.02 INSTALLATION

A. Install components plumb, level, rigid, scribed to adjacent finishes in accordance with reviewed Shop Drawings and Product installation details.

B. Fabricate field joints using manufacturer's recommended adhesive, with joints being inconspicuous in finished work. Exposed joints/seams are not permitted. Keep components and hands clean when making joints. Reinforce field joints as specified herein. Cut and finish component edges with clean, sharp returns.

C. Route radii and contours to template. Anchor securely to base component or other supports. Align adjacent components and form seams to comply with manufacturer’s written recommendations using adhesive in color to match work. Carefully dress joints smooth, remove surface scratches and clean entire surface.

D. Install sills with no more than 1/8" sag, bow or other variation from a straight line.

E. Seal between wall and components with joint sealant as specified herein and in Section 07920, as applicable.

3.03 REPAIR

A. Repair minor imperfections and cracked seams and replace areas of severely damaged surfaces in accordance with manufacturer’s “Technical Bulletins”.

3.04 SITE QUALITY CONTROL

A. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Architect at no cost to Owner.

3.05 CLEANING

A. Remove excess adhesive and sealant from visible surfaces.

B. Clean surfaces in accordance with manufacturer’s “Care and Maintenance Instructions”.

3.06 PROTECTION

A. Provide protective coverings to prevent physical damage or staining following installation for duration of construction phase.

B. Protect surfaces from damage until date of Substantial Completion of the Work.

END OF SECTION
SECTION 06651 - SOLID SURFACE COUNTERTOPS

1.1 SUMMARY

A. Section Includes solid surfacing fabrication including but not limited to the following:

1. Solid surface material countertops.
2. Solid surface material backsplashes.
3. Solid surface material end splashes.
4. Solid surface material apron fronts.
5. Solid surface material sinks.

1.2 SUBMITTALS

A. Product Data: For countertop materials and sinks.

B. Shop Drawings: Submit Shop Drawings for work of this Section in accordance with Section 01300. Indicate plans, sections, dimensions, component sizes, edge details, thermosetting requirements, fabrication details, attachment provisions, sizes of furring, blocking, including concealed blocking and coordination requirements with adjacent work. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacles and other items installed in the solid surface.

C. Samples: For each type of material exposed to view.

1.01 QUALITY ASSURANCE

A. Qualifications:

1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

B. Mock-Ups:

1. Prior to final approval of Shop Drawings, erect 1 full size mock-up of each component at Project site demonstrating quality of materials and execution for Architect review.
2. Should mock-up not be approved, rework or remake until approval is secured. Remove rejected units from Project site.
3. Approved mock-up will be used as standard for acceptance of subsequent work.
4. Approved mock-ups may remain as part of finished work.

1.02 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements: Deliver no components to Project site until areas are ready for installation.

B. Storage and Handling Requirements:

1. Store components indoors prior to installation.
SECTION 06651 - SOLID SURFACE COUNTERTOPS

2. Handle materials to prevent damage to finished surfaces.

1.03 WARRANTY

A. Manufacturer Warranty: Provide manufacturer’s standard warranty for material only for period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Architect and at no expense to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer List: Products of the following manufacturers are acceptable subject to conformance to requirements of the Drawings, Schedules and Specifications:
1. Meganite; www.meganite.com Corian by Dupont; www.corian.com
2. Samsung Chemical USA; www.staron.com
3. Wilsonart Contract; www.wilsonartcontract.com
4. Or Approved Equal.

2.2 SOLID SURFACE COUNTERTOP MATERIALS

A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
1. Type: Provide Standard type unless Special Purpose type is indicated.
2. Integral Sink Bowls: Comply with CSA B45.5/IAPMO Z124.
3. Colors and Patterns: As selected by Architect from manufacturer's full range.

B. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

2.3 COUNTERTOP FABRICATION

A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."

B. Configuration:
1. Front: Radius edge with separate apron
2. Backsplash: Straight, slightly eased at corner.

C. Countertops: 1-inch-thick, solid surface material with radius edge built up with same material.

D. Backsplashes: 1/2-inch-thick, solid surface material.

E. Joints: Fabricate countertops without joints.
SECTION 06651 - SOLID SURFACE COUNTERTOPS

2.4 INSTALLATION MATERIALS

A. Adhesive: Product recommended by solid surface material manufacturer.

B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work. Proceed with installation only after unsatisfactory conditions have been corrected.

2. Verify actual site dimensions and location of adjacent materials prior to commencing work.

3. Examine cabinets upon which counter tops are to be installed. Verify cabinets are level to within 1/8" in 10' - 0".

4. Notify Architect in writing of any conditions which would be detrimental to installation.

B. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 INSTALLATION

A. Install components plumb, level, rigid, scribed to adjacent finishes in accordance with reviewed Shop Drawings and Product installation details.

B. Fabricate field joints using manufacturer's recommended adhesive, with joints being inconspicuous in finished work. Exposed joints/seams are not permitted. Keep components and hands clean when making joints. Reinforce field joints as specified herein. Cut and finish component edges with clean, sharp returns.

C. Route radii and contours to template. Anchor securely to base component or other supports. Align adjacent components and form seams to comply with manufacturer's written recommendations using adhesive in color to match work. Carefully dress joints smooth, remove surface scratches and clean entire surface.

D. Install countertops/sills with no more than 1/8" sag, bow or other variation from a straight line.

E. Seal between wall and components with joint sealant as specified herein and in Section 07920, as applicable.
SECTION 06651 - SOLID SURFACE COUNTERTOPS

F. Provide backsplashes and endsplashes as indicated on Drawings. Adhere to countertops using a standard color-coordinated silicone sealant. Adhere applied sidesplashes to countertops using a standard color-matched silicone sealant. Provide coved backsplashes and sidesplashes at walls and adjacent millwork. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on reviewed Shop Drawings. Adhere to countertops using manufacturer’s standard color-coordinated joint adhesive.

G. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Ensure components are clean on date of Substantial Completion of the Work.

3.3 REPAIR

A. Repair minor imperfections and cracked seams and replace areas of severely damaged surfaces in accordance with manufacturer’s “Technical Bulletins”.

3.4 SITE QUALITY CONTROL

A. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Architect at no cost to Owner.

3.5 CLEANING

A. Remove excess adhesive and sealant from visible surfaces.

B. Clean surfaces in accordance with manufacturer’s “Care and Maintenance Instructions”.

3.6 PROTECTION

A. Provide protective coverings to prevent physical damage or staining following installation for duration of construction phase.

B. Protect surfaces from damage until date of Substantial Completion of the Work.

END SECTION 06651
SECTION 07160 - BITUMINOUS DAMPPROOFING

1.1 GENERAL

A. Submittals: Submit product data for each type of product specified, including data substantiating that materials comply with local regulations controlling use of volatile organic compounds (VOCs).

1.2 PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:

1. Cold-Applied, Cut-Back Asphalt Dampproofing:
   b. Karnak Chemical Corporation.
   d. Or approved equal.

B. Bituminous Dampproofing, General: Provide products recommended by manufacturer for designated application.

1. Odor Elimination: Provide material warranted by manufacturer to be odor free after drying for 24 hours under normal conditions.

C. Cold-Applied, Cut-Back Asphalt Dampproofing: Asphalt and solvent compound providing a firm, moisture-resistant, vapor-resistant, elastic coating.

1. Trowel Grade: Asphalt roof cement complying with ASTM D 4586, Type I.

D. Primer: Asphalt primer complying with ASTM D 41, for asphalt-based dampproofing.

E. Glass Fabric: Woven glass fabric, treated with asphalt, complying with ASTM D 1668, Type I.

1.3 EXECUTION

A. Preparation: Clean substrate and comply with recommendations of prime materials manufacturer.

1. Fill voids, seal joints, and apply bond breakers as recommended by prime materials manufacturer.
2. Install separate flashings and corner protection stripping as recommended by prime materials manufacturer.
3. Prime substrate as recommended by prime materials manufacturer.
4. Protection of Other Work: Prevent spillage and migration onto other surfaces of adjoining work.

B. Application: Apply dampproofing where indicated on Drawings. Apply 2 coats as recommended by manufacturer.
SECTION 07160 - BITUMINOUS DAMPPROOFING

1. Reinforcement: At changes in plane or as shown, install lapped course of glass fabric in first coat of dampproofing compound.
2. Apply vertical dampproofing down walls from finished-grade line (below brick veneer) to top of footing, extend over top of footing, and down a minimum of 6 inches (150 mm) over outside face of footing. Extend 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when the Project is completed.

C. Cold-Applied, Cut-Back Asphalt Dampproofing: Apply on exterior surfaces only.

1. Trowel Grade: Apply at a minimum rate of 7 gal./100 sq. ft. (2.8 L/sq. m), to produce an average, dry-film thickness of 70 mils (1.8 mm) but not less than 30 mils (0.8 mm) at any point.
2. Apply a second coat, as specified above, after allowing 24 hours for first coat to dry. Apply second coat at a rate of 0.8 to 1.25 gal./100 sq. ft. (0.3 to 0.5 L/sq. m). Double the thickness of second coat where first application has failed to produce a smooth, shiny, impervious coat.

D. Protect exterior, below-grade dampproofing membrane from damage until backfill is completed. Remove over spray and spilled materials from surfaces not intended to receive dampproofing.

1. “APS Protection Course” or approved equal.

END OF SECTION 07160
SECTION 07170 - ULTRA SEAL® (OR APPROVED EQUAL) WATERPROOFING SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All of the Contract Documents, including General and Supplementary Conditions, and Division 1 General requirements, apply to the work of this section.

1.02 WORK SUMMARY

A. The contractor must provide and install at least 2,000 SF of material or greater regardless of the quantity required for this project to obtain the warranty.

B. The work of this section includes, but is not limited to the furnishing and installing the following materials, per project specifications and drawings, or as directed by waterproofing manufacturer:

1. Ultra Seal SP by CETCO (or approved equal) waterproofing membranes with all applicable accessory products.

1.034 SYSTEM DESCRIPTION

A. Provide waterproofing system to prevent the passage of liquid water and install without defects, damage or failure. Waterproofing shall be an active-polymer core technology with all applicable accessory products.

1.045 SUBMITTALS

A. General: Prepare and submit specified submittals in accordance with "Conditions of the Contract" and Division 1 Submittals Sections.

B. Product Data: Submit manufacturer’s product data, with complete general and specific installation instructions, recommendations, and limitations.

C. Product Samples: Submit representative samples of the following for approval:

1. Ultra Seal SP by CETCO (or approved equal) waterproofing membranes

D. Material Certificates: Submit certificate(s) signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements. Submit certification that waterproofing system and components, drainage and protection materials are supplied by a single-source manufacturer. This information must be job specific for this project.

E. Contractor Certificate: At time of bid, submit written certification/letter that installer has current Approved Applicator status with waterproofing material manufacturer.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Installing company should have at least three (3) years’ experience in work of the type required by this section, who can comply with manufacturer's warranty requirements, and who is an Approved Applicator as determined by waterproofing/drainage system manufacturer. Submit references.
SECTION 07170 - ULTRA SEAL® (OR APPROVED EQUAL) WATERPROOFING SYSTEM

B. Manufacturer Qualifications: Waterproofing membranes and all accessory products shall be provided by a single manufacturer with a minimum of 30 years’ experience in the direct production and sales of waterproofing systems. Manufacturer shall be capable of providing field service representation during construction, approving an acceptable installer, and recommending appropriate installation methods.

C. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field installation to establish procedures to maintain required working conditions and to coordinate this work with related and adjacent work. Verify that final waterproofing and waterstop details comply with waterproofing manufacturer's current installation requirements and recommendations. Pre-con meeting attendees should include representatives for the owner, architect, inspection firm, general contractor, waterproofing contractor, concrete contractor, excavating/backfill contractor, and mechanical and electrical contractors if work penetrates the waterproofing.

D. Materials: Obtain waterproofing with accessory products and prefabricated drainage materials from a single manufacturer to assure material compatibility.

E. Inspection: Manufacturer’s representative shall inspect waterproofing installation periodically during application to verify that waterproofing has been installed in accordance with manufacturer’s guidelines and recommendations.

F. Water Sample Test: Waterproofing contractor shall supply project site water sample to waterproofing membrane manufacturer for analysis. Manufacturer shall conduct test free of charge. Contractor is responsible for collection and shipment of one liter of actual site water. Water should be shipped in uncontaminated, sealed plastic container to: CETCO (or approved equal manufacturer), 2870 Forbs Ave, Hoffman Estates, IL 60192, Attn: BMG Field Services. Also provide project name, city and state along with return address to forward test results.

G. Independent Inspection: The Contractor shall make all arrangements and payments for an independent inspection service to monitor waterproofing material installation compliance with the project contract documents and manufacturer's published literature and site specific details. Independent Inspection Firm shall be an approved company participating with the waterproofing manufacturer’s Certified Inspection Program. Inspection service shall produce reports and digital photographs documenting each inspection. Reports shall be made available to the Contractor, waterproofing installer, waterproofing material manufacturer, Construction Manager, and Architect. Inspections should include substrate examination, beginning of waterproofing installation, at least two (2) times per week, and final inspection prior to concrete or backfill placement against the waterproofing. Pre-approved independent inspectors are listed below. Other inspectors will be considered in accordance with Specification Section 01300 - Submittals and approved by the product manufacturer.

Maintenance Management, Inc. Construction Services, 500 Harper Avenue, Drexel Hill, PA 19026 610-626-8211

David Blackmore and Associates, Inc., 3335 West Ridge Pike, Pottstown, PA 19464 610-495-6255

Atlantic Engineering, 41 Murray Street, Rahway, NJ 07065 752-815-0400
SECTION 07170 - ULTRASEAL® (OR APPROVED EQUAL) WATERPROOFING SYSTEM

Contractor may use another inspector subject to review and approval by the Construction Manager and Architect.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery and Handling: Deliver materials in factory sealed and labeled packaging. Sequence deliveries to avoid delays, while minimizing on-site storage. Handle and store following manufacturer's instructions, recommendations and material safety data sheets. Protect from construction operation related damage, as well as, damage from weather, excessive temperatures and prolonged sunlight. Remove damaged material from site and dispose of in accordance with applicable regulations.

B. Storage: Do not double-stack pallets during shipping or storage. Protect waterproofing materials from moisture, excessive temperatures and sources of ignition. Provide cover, top and all sides, for materials stored on-site, allowing for adequate ventilation.

1.07 PROJECT CONDITIONS

A. Substrate Condition: Proceed with work only when substrate construction and preparation work is complete and in condition to receive waterproofing system. Both the Installer and Independent Inspector must provide written acceptance of the substrate prior to start of installation.

B. Weather Conditions: Perform work only when existing and forecasted weather conditions are within the guidelines established by the manufacturer of the waterproofing materials. Do not apply waterproofing materials in areas of standing or active water; or over ice and snow. Though exposure to precipitation and ground water seepage typically will not adversely affect the waterproofing membrane, the Contractor shall maintain site conditions to remove standing water from precipitation or ground water seepage in a timely manner. Should the waterproofing membrane be subjected to pre-hydration as a result of prolonged immersion, inspection of the material and written acceptance from CETCO (or approved manufacturer) is required prior to concrete or backfill placement.

1.08 WARRANTY

A. Waterproofing Warranty: Upon completion and acceptance of the work required by this section, the waterproofing materials manufacturer will provide a written ten (10) year warranty, covering both materials and labor, to the project owner. Issuance of Manufacturer's HydroShield Warranty (or approved equal’s manufacturer warranty) requires the following: (1) System waterproofing products and drainage composite products shall have been provided by a single manufacturer; (2) Installation of waterproofing products and prefabricated drainage composite by Manufacturer's Approved Applicator; (3) Installation inspected by Independent Inspection Firm per Section 1.06; (4) In Section 3 work, Waterstop-RX (or approved equal) must be installed in all applicable horizontal and vertical cold pour concrete construction joints and around applicable penetrations. Manufacturer's warranty shall be independent from any other warranties made by the Contractor under requirements of the Contract Documents and may run concurrent with the other warranties.

NOTE: The contractor must provide and install at least 2,000 SF of material or greater regardless of the quantity required for this project to obtain the warranty.
SECTION 07170 - ULTRALEASE® (OR APPROVED EQUAL) WATERPROOFING SYSTEM

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Provide waterproofing membranes and applicable accessories as manufactured by the following or approved equal:

1. Colloid Environmental Technologies Company (CETCO), 2870 Forbs Ave, Hoffman Estates, IL 60192,, USA. Phone: (847) 851-1800; Fax: (847) 851-1899; Web-site: http://www.cetco.com/bmg; local representative: Rich Kline Email: Richard.kline@mineraltech.com. Phone (610) 349-6698.

2. Clem Corp.

3. Claymax Corp

4. or approved equal.

2.02 MATERIALS

A. APC WATERPROOFING MEMBRANES

1. The basis of design shall be the ULTRALEASE SP MEMBRANE (or approved equal): 200-mil (4.7 mm) thick composite membrane consisting of a active-polymer core (APC) encapsulated by a geomembrane liner and a geotextile using a proprietary mechanical process. ULTRALEASE SP (or approved equal) application - under structural slabs. Roll size: 4’ x 25’ (1.2 x 7.62 m)

Membrane Performance Properties:

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<thead>
<tr>
<th>PROPERTY</th>
<th>TEST METHOD</th>
<th>TYPICAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrostatic Pressure Resistance</td>
<td>ASTM D 5385 mod.</td>
<td>231 ft. (70 m)</td>
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<tr>
<td>Permeability</td>
<td>ASTM D 5084</td>
<td>&lt;1 x 10⁻¹¹ cm/sec.</td>
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<tr>
<td>Grab Tensile Strength</td>
<td>ASTM D 4632</td>
<td>300 lbs.</td>
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<tr>
<td>Puncture Resistance</td>
<td>ASTM D 4833</td>
<td>130 lbs.</td>
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<tr>
<td>Low Temperature Flexibility</td>
<td>ASTM D 1970</td>
<td>Unaffected at -25°F (-32°C)</td>
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<td>Elongation</td>
<td>ASTM D 4632</td>
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<tr>
<td>Peel Adhesion to Concrete</td>
<td>ASTM D 903 mod.</td>
<td>10 lbs./in.</td>
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C. ACCESSORY WATERPROOFING PRODUCTS: All accessory waterproofing materials shall be provided by the same waterproofing manufacturer or approved equal.

1. Bentoseal® (or approved equal): Trowel grade sodium bentonite compound used as a detailing mastic around penetrations, corner transitions and grade terminations.

2. Hydrobar Tubes (or approved equal): 2” (50 mm) diameter x 2’ (60 cm) long, water soluble tube container filled with granular sodium bentonite

3. Waterstoppage® (or approved equal): 50 lbs. (22.7 kg) bag of granular Volclay sodium bentonite

4. SeamTape® (or approved equal): 2” (50 mm) wide butyl rubber sealant tape.

5. Termination Bar: Min. 1” (25 mm) wide aluminum bar with pre-punched holes on 12” (300 mm) centering for fastening.

6. Cementitious Wall Board: ½” thick cementitious board for protection of waterproofing during the removal of metal soldier pile cap and top lagging boards.
SECTION 07170 - ULTRA SEAL® (OR APPROVED EQUAL) WATERPROOFING SYSTEM

7. CETSEAL – single-component polyether general adhesive and sealant
8. TB-Boots – pre-molded thermoplastic tie-back covers
9. GF-40SA – general flashing membrane used for grade detailing.

PART 3 – EXECUTION

A. Comply with contract documents and manufacturer's product data, including product application and installation instructions.

3.01 SUBSTRATE INSPECTION AND CONDITIONS

A. The installer, with the Owner’s Independent Inspector present, shall examine conditions of substrates and other conditions under which this section work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected and are acceptable for compliance with manufacturer's warranty requirements. General substrate conditions acceptable for the waterproofing installation are listed below. For conditions not covered in this Section, contact the waterproofing manufacturer for guidance.

B. SOIL SUBSTRATES: Site conditions allowing, the waterproofing membrane applications do not require a mud-working slab. Grade substrates should consist of well-leveled soils without voids and debris, and compacted to a minimum of 85% Modified Proctor density. If substrate consists of large aggregate, place a high-strength geotextile layer over the aggregate and then provide several inches of compacted soil or sand for uniform support and containment of waterproofing sheets.

C. WOOD TIMBER SHORING: Wood lagging shoring should extend to the lowest level of the waterproofing installation with any voids or cavities exterior of the lagging timbers filled with compacted soil or cementitious grout. Interior surface of lagging boards should be planar and tight together with gaps less than 1” (25 mm). Gaps in excess of 1” should be filled with cementitious grout, compacted soil, wood, extruded polystyrene (40 psi min.) or CETCO (or approved equal’s manufacturer) approved polyurethane spray foam. Do not use plywood or other surface treatment over large lagging gaps that leave the cavity void. In areas where lagging gaps are 2-1/2” (63 mm) or less, Aquadrain (or approved equal) sheet drainage can be installed over lagging to provide uniform surface to mount the waterproofing without requirement of filling gaps. Aquadrain sheet and 100BD base drain system should be connected to an operative water discharge system.

D. CUT ROCK FACE OR AUGER CAST CAISSON SHORING WALLS: Interior surface of cut rock and concrete auger pile retention walls should be planar without irregular surface conditions, voids, and sharp transitions that would leave a void space to the outside of the drainage and waterproofing installation. Irregular rock, void pockets, cracks, sharp concave transitions should be completely filled or smoothed with cementitious grout, shotcrete, or other approved solid material.

E. MECHANICAL OR OTHER PENETRATIONS: Mechanical, structural, or architectural materials that will pass through the plane of the waterproofing membrane shall be properly installed and secured in their final position prior to installation of the waterproofing system.
SECTION 07170 - ULTRASEAL® (OR APPROVED EQUAL) WATERPROOFING SYSTEM

F. CONCRETE: Concrete to be waterproofed shall be properly placed and consolidated. Reinforced structural slabs should be a minimum of 6" (150 mm) thick when placed on a working mud slab. Reinforced concrete slab(s) on compacted grade shall be a minimum of 4" (100 mm) thick. When hydrostatic conditions exist, install the waterproofing membrane under all footings, elevator pits and grade beams. Cast-in-place concrete to receive waterproofing shall be of sound structural grade with a smooth finish, free of debris, oil, grease, laitance, dirt, dust, or other foreign matter which will impair the performance of the waterproofing and drainage system and which do not comply with manufacturer's warranty requirements. The waterproofing membrane can be installed on green structural concrete as soon as the forms are removed provided the contractor gains written approval from project structural engineer listing any site specific concrete curing time requirement. Do not apply the waterproofing membrane over lightweight insulating concrete.

1. Horizontal deck or roof concrete surfaces should be sloped for proper drainage.
2. Form fins, ridges, and other protrusions should be level and smooth with monolithic concrete surface.
3. Honeycombing, aggregate pockets, tie-rod holes and other voids should be completely filled with non-shrink cementitious grout and level with monolithic concrete surface.
4. All expansion joints should receive applicable expansion joint sealant product manufactured by others prior to the installation of the Waterproofing System. Expansion joint material is the primary seal at the expansion joint and the expansion joint material manufacturer is responsible for water tightness of the joint.

NOTE: Related work to be completed under Division 3. Waterstop-RX (or approved equal) shall be installed in all applicable vertical and horizontal concrete construction cold pour joints and around applicable penetrations and structural members. Refer to Waterstop-RX (or approves equal) Product Manual for further installation procedures and guidelines.

3.02 SURFACE PREPARATION

A. Remove dirt, debris, oil, grease, cement laitance, or other foreign matter which will impair or negatively affect the performance of the waterproofing and drainage system.

B. Protect adjacent work areas and finish surfaces from damage or contamination from waterproofing products during installation operations.

3.03 GENERAL INSTALLATION GUIDELINES

A. Property Line Walls, install the waterproofing membrane with the white liner side facing down. Overlap the waterproofing membrane edges minimum 4" (100 mm). Backfilled walls and roofs of earth covered structures.

B. Expansion Joints: The waterproofing membrane is not an expansion joint filler or sealant, but may be used as an expansion joint cover over a properly installed expansion joint material placed during substrate preparation. To use the waterproofing membrane as an expansion joint cover, trowel 1/8" (3 mm) thick, 6" (150 mm) wide layer of Bentoseal (or approved equal) centered over expansion joint. Install a 24" (60 cm) wide strip of the waterproofing membrane centered over the expansion joint. Then install the main course of the waterproofing membrane.

3.04 UNDER SLAB INSTALLATION
SECTION 07170 - ULTRASEAL® (OR APPROVED EQUAL) WATERPROOFING SYSTEM

A. Reinforced structural foundation slabs should be a minimum of 6" (150 mm) thick when placed on a working mud slab. Reinforced concrete slab(s) on compacted grade shall be a minimum of 4” (100 mm) thick. Install the waterproofing membrane under all footings, elevator pits and grade beams when hydrostatic conditions exist or are anticipated per the historical high ground water elevation reported in the project’s geotechnical documents.

B. Install Unterslab the waterproofing membrane extending to base of shoring wall (tan geotextile side up) fully overlapping the 12" (300 mm) horizontal tail of the waterproofing membrane corner transition sheet installed per Section 3.05 Work. Secure corner edge of membrane with washer-head fasteners or pneumatic staples 12" (300 mm) on center.

C. Place the waterproofing membrane directly on properly prepared substrate (poly side down; tan geotextile side up facing installer) with adjoining edges overlapped a minimum of 4” (100 mm). Stagger sheet end seams a minimum of 24” (60 cm). Mechanically fasten or staple the waterproofing membrane 12” (300 mm) on center to prevent movement from construction operations or concrete placement. When the slab is poured in sections, extend the waterproofing membrane a minimum 12" (300 mm) beyond the slab edge to enable proper overlapping.

D. Detail all slab penetrations, grade beams, and pile caps, install 1/4” (6 mm) thick layer of Waterstop extending a 6” (150 mm) radius. Cut the waterproofing membrane to fit snugly around penetrations and pile caps. Around base of penetrations trowel 3/4” (18 mm) thick fillet of Bentoseal (or approved equal) and extend the Bentoseal (or approved equal) up the penetration 1-1/2” (38 mm) and onto the waterproofing membrane. Around base of pile caps and grade beams trowel 3/4” (18 mm) thick fillet of Bentoseal (or approved equal) and extend the Bentoseal (or approved equal) up the cap and onto the waterproofing membrane a minimum 2” (50 mm).

E. Inspect finished the waterproofing membrane installation and repair any damaged material prior to concrete slab placement.

NOTE: Related work to be completed under Division 3. Waterstop-RX (or approved equal) shall be installed in all slab joints, around applicable slab penetrations and structural members. Refer to Waterstop-RX (or approved equal) Product Manual for further installation procedures and guidelines.

3.05 SLAB/BACKFILLED WALL FOOTING EDGE TRANSITION COURSE

A. Inside the slab/footing form edge, secure the waterproofing membrane sheet horizontally oriented (poly side down; tan geotextile facing installer) to the top inside edge of the exterior slab/footing form with the sheet conforming to the interior form surfaces and then extending out onto the horizontal slab substrate a minimum 12" (300 mm). Overlap edges of adjacent the waterproofing membrane sheets a minimum 4" (100 mm) and secure to prevent sheet movement during construction or concrete placement.

3.06 UNDER SLAB INSTALLATION

A. Install the waterproofing membrane under all footings, elevator pits and grade beams when hydrostatic conditions exist or are anticipated per the historical high ground water elevation reported in the project’s geotechnical documents.
SECTION 07170 - ULTRA SEAL® (OR APPROVED EQUAL) WATERPROOFING SYSTEM

B. Install the waterproofing membrane (poly side down; tan geotextile side up) extending to interior edge of footing/slab edge, fully overlapping the 12” (300 mm) horizontal tail of the waterproofing membrane slab edge sheet installed in Step B, Section 3.04B. Overlap edges of adjacent the waterproofing membrane sheets a minimum 4” (100 mm) and secure to prevent sheet movement during construction or concrete placement.

C. Place the waterproofing membrane directly on properly prepared substrate (poly side down; tan geotextile side up facing installer) with adjoining edges overlapped a minimum of 4” (100 mm). Stagger sheet end seams a minimum of 24” (60 cm). Mechanically fasten or staple the waterproofing membrane 12” (300 mm) on center to prevent movement from construction operations or concrete placement. When the slab is poured in sections, extend the waterproofing membrane a minimum 12” (300 mm) beyond the slab edge to enable proper overlapping.

D. Detail all slab penetrations, grade beams, and pile caps, install 1/4” (6 mm) thick layer of Waterstoppage extending a 6” (150 mm) radius. Cut the waterproofing membrane to fit snugly around penetrations and pile caps. Around base of penetrations trowel 3/4” (18 mm) thick fillet of Bentoseal (or approved equal) and extend the Bentoseal (or approved equal) up the penetration 1-1/2” (38 mm) and onto the waterproofing membrane. Around base of pile caps and grade beams trowel 3/4” (18 mm) thick fillet of Bentoseal (or approved equal) and extend the Bentoseal (or approved equal) up the cap and onto the waterproofing membrane a minimum 2” (50 mm).

E. Inspect finished the waterproofing membrane installation and repair any damaged material prior to concrete slab placement.

NOTE: Related work to be completed under Division 3. Waterstop-RX (or approved equal) shall be installed in all slab joints, around applicable slab penetrations and structural members. Refer to Waterstop-RX (or approved equal) Product Manual for further installation procedures and guidelines.

3.07 BACKFILL EXCAVATED CAST-IN-PLACE CONCRETE WALLS

A. Backfill shall be placed promptly after the waterproofing membrane waterproofing has been installed. Closely coordinate with contractor responsible for Backfill work by informing them each time a waterproofed area is ready for backfill. Care should be used during backfill operation to avoid damage to the waterproofing system. Backfill operations shall follow generally accepted practices for placement and compaction. Backfill should be added in 6" to 12" (150 - 300 mm) lifts and compacted to a minimum 85% Modified Proctor density. If gravel backfill, specify angular aggregate <3/4” (18mm) with fines.

3.08 CLEAN UP

A. In areas where adjacent finished surfaces are soiled by work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their recommendations and instructions. Remove all tools, equipment and remaining product on-site. Dispose of section work debris and damaged product following all applicable regulations.

END OF SECTION 07170
SECTION 07190 - VAPOR BARRIER

PART 1 – GENERAL

1.1 SUMMARY

A. Products supplied under this section:
   1. Vapor barrier, seam tape, mastic, pipe boots, detail strip for insulation under concrete slabs.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM E 1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
   5. ASTM E 1643 Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

B. American Concrete Institute (ACI):
   1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

1.3 SUBMITTALS

A. Quality control/assurance:
   1. Full set of test results as per paragraph 8.3 of ASTM E 1745.
   2. Manufacturer's samples, literature.
   3. Manufacturer's installation instructions for placement, seaming and penetration repair instructions.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Vapor barrier must have all of the following qualities:
   1. Permeance as tested after conditioning of less than 0.03 Perms [grains/(ft² · hr · inHg)] as tested in accordance with ASTM E 1745 Paragraphs 7.1.2-5.
   2. Other performance criteria:
      a. Strength: ASTM E 1745 Class A.
      b. Minimum thickness of the plastic retarder material: 10 mils.

B. Vapor barrier products:
   2. Or approved equal.
SECTION 07190 - VAPOR BARRIER

2.2 ACCESSORIES

A. Seam tape:
   2. Or approved equal.

B. Vapor-proofing mastic:
   2. Or approved equal.

PART 3 – EXECUTION

3.1 PREPARATION

A. Ensure that base material is approved by Architect or Geotechnical Engineer.
   1. Level and compact base material.

3.2 INSTALLATION

A. Install vapor barrier retarder in accordance with manufacturer’s instructions and ASTM E 1643.
   1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement.
   2. Lap vapor barrier over footings and/or in recessed haunches for a continuous installation. Seal the vapor barrier to the foundation walls.
   3. Overlap joints 6 inches and seal with manufacturer’s tape.
   4. Seal all penetrations (including pipes) per manufacturer’s instructions.
   5. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
   6. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all sides with tape.

END OF SECTION
SECTION 07200 - WATER REPELLENTS (For Brick Veneer & Concrete Masonry Unit)

1.1 GENERAL

A. Submit Product Data for each product specified.

B. Warranty: 5-Year Manufacturer's Authorized Warranty. Test should be done before the application to determine the material needed to coat the surface.

1.2 PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:

1. BASF – Master Builders Solutions – MasterProtect H 177 for Brick
2. MAB - Modac Products Company - Siloxane 40
3. STO Concrete Restoration Division - STO Penetration Sealer CR650

B. Siloxanes: Penetrating water repellent. Alkylalkoxysiloxanes that are oligomeric with alcohol, ethanol, mineral spirits, water, or other proprietary solvent carrier.

1. With more than 8.3-lb/gal. (400-g/L) VOCs.

C. Silane/Siloxane Blends: Consisting of silanes and siloxanes blended to achieve a particular penetration and protection on a specific substrate.

1. With more than 8.3-lb/gal. (400-g/L) VOCs.

2.1 EXECUTION

A. A preconstruction on site meeting is required with the manufacturer's representative to verify the existing conditions, moisture test and sample area completed prior to the preconstruction meeting conform to the manufacturer's installation requirements and warranty.

B. Preparation: Clean substrate and test for moisture content according to repellent manufacturer's written instructions.

1. Concrete Masonry Unit: Remove oil, curing compounds, laitance, and other substances that could prevent adhesion or penetration of water repellents.
2. Clay Brick Masonry: Clean clay brick masonry per ASTM D 5703.

C. Test for pH level, according to water repellent manufacturer's written instructions, to ensure chemical bond to silicate minerals.

D. Protect Adjoining Work: Cover nearby surfaces of aluminum and glass. Cover live plants and grass.

E. Coordination with Sealants: Do not apply water repellent until sealants have been installed and cured.
SECTION 07200 - WATER REPELLENTS (For Brick Veneer & Concrete Masonry Unit)

F. Application: Apply at the end of the project after the masonry has been completed for a minimum of six (6) months. If the Substantial Completion date is prior to this, the Contractor shall re-mobilize and complete this scope following the Substantial Completion date. Comply with manufacturer's written instructions. Apply a mist coat and a heavy-saturation coat using low-pressure spray equipment. Apply a second coat per manufacturer's written instructions.

G. Remove protective coverings from adjacent surfaces and other protected areas.

H. Clean adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses per manufacturer's written cleaning instructions. Repair damage caused by water-repellent application.

2.2 LOCATION

A. The following areas are to be coated by this product.

1. All new brick, CMU and Cast Stone veneer work
2. All areas as shown on the Contract Drawings.

END OF SECTION 07200
SECTION 07210-BUILDING INSULATION

1.1 GENERAL

A. Submittals: Product Data for each type of insulation product specified.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated as determined by testing identical products per NFPA 285, ASTM E 84, ASTM E 119, or ASTM E 136 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1.2 PRODUCTS

A. General: Provide insulating materials that comply with requirements and with referenced standards.

1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer’s standard thickness, widths and lengths.

B. For below slab insulation: Extruded-Polystyrene Board Insulation: ASTM C 578 for type indicated below:

1. Under Slab Type IV, 1.60-lb/cu. ft. (26-kg/cu. m) minimum density.

C. For masonry cavity insulation: Board Insulation: Polyisocyanurate Foam – Board Insulation: ASTM C 1289, foil faced, Type I, Class 1 or 2. Do not tape the Board joints. Leave joints open for vapor permeability.


D. For all interior walls at Workforce Development and the Second Floor of Rowan Medicine: Unfaced Mineral-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing) of type described below:

1. Mineral-Fiber Type: Fibers manufactured from glass. (3 5/8" R=13, 6" R=19).
2. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indices of 25 and 50, respectively.

E. For all interior Walls at the First Floor of Rowan Medicine: Slag-Wool-Fiber Board Safing Insulation: Semirigid boards designed and produced by combining slag-wool fibers with thermosetting resin binders to comply with ASTM C 612, Type IA and IB; nominal density of 4 lb/cu. ft. (64kg/cu. m); passing ASTM E 136 for combustion characteristics; thermal resistivity of 4 deg. F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).

2. Pack insulation and cut around all outlets, wiring and devices to provide a maximum acoustic separation and sound deadening.
SECTION 07210-BUILDING INSULATION

F. For all Exterior Walls or Attic Spaces: Unfaced Mineral-Fiber Blanket Insulation: ASTM C 665, Type III, Class A.

   1. Mineral-Fiber Type: Fibers manufactured from glass. (6" R=19)

G. For use as fire stop at openings between edge of slab and exterior wall panels: Provide a fire tested assembly where required. Slag-Wool-Fiber Board Safing Insulation: Semirigid boards designed and produced by combining slag-wool fibers with thermosetting resin binders to comply with ASTM C 612, Type IA and IB; nominal density of 4 lb/cu. ft. (64kg/cu. m); passing ASTM E 136 for combustion characteristics; thermal resistivity of 4 deg. F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).

   1. Calking Compound: Material approved by manufacturer of safing insulation for sealing joint between foil backing of safing insulation and edge of concrete floor slab against penetration of smoke.

   2. Safing Clips: Galvanized steel safing clips approved by manufacturer of safing insulation for holding safing insulation in place.

H. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of hoisting insulation, of thickness indicated, securely in position indicated with self-locking washer in place; and complying with the following requirements:

   1. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.

   2. Spindle: Copper-coated low carbon steel, fully annealed, 0.105 inches (2.67 mm) in diameter, length to suit depth of insulation indicated.

1.3 EXECUTION

A. Installation, General: Comply with insulation manufacturer's written instructions applicable to products and application indicated.

   1. Install insulation that is undamaged, dry, unsoiled, and has not been exposed at any time to ice and snow.

   2. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

   3. Apply single layer of insulation to produce thickness indicated.

   4. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

   5. Seal joints between closed-cell (nonbreathing) insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant.

   6. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:

      a. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
b. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

7. Install insulation in curtain-wall construction where indicated on Drawings according to curtain-wall manufacturer's written instructions.

8. Retain insulation in place by metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass. Maintain cavity width of dimension indicated between insulation and glass.

9. Install insulation where it contacts perimeter fire-containment system to prevent insulation from bowing under pressure from perimeter fire-containment system.

10. Stuff glass-fiber, loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

11. Attic insulation board should be a tight fit at the bottom of the rafters. Apply thermo-ply sheathing under insulation board to act as vapor barrier and insulation board support.

12. In between bathroom walls and cavity walls where there is no gypsum wall board sheathing on the inside face, provide horizontal metal straps between studs at 48” on center to hold insulation in place.

B. Protect below-grade insulation on vertical surfaces from damage during backfilling by applying protection board. Set in adhesive according to written instructions of insulation manufacturer.

C. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors.

D. Place loose-fill insulation into spaces and onto surfaces as shown, either by pouring or by machine blowing to comply with ASTM C 1015.

E. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84 for surface-burning characteristics, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

END OF SECTION
SECTION 07250 - GYPSUM BOARD WEATHER-RESISTANT BARRIER AND AIR BARRIER SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Work of this section includes coated fiberglass-mat gypsum sheathing board system with integral weather-resistant barrier (WRB) and air barrier (AB) features, and all accessory materials required for covering sheathing joints, fasteners, penetrations, rough openings, and material transitions, for use under exterior wall claddings.

B. Fluid-applied membrane air barrier

1.2 RELATED SECTIONS

A. Section 01400 Quality Requirements coordination with owners’ independent testing and inspection agency.

B. Section 05400 Cold-Formed Metal Framing

C. Section 06100 Rough Carpentry

D. Section 07920 Joint Sealants; sealant materials and installation techniques

E. Section 09255 Gypsum Board Assemblies

F. Exterior wall claddings

1.3 DEFINITIONS

A. Air Barrier (AB): Air tight barrier made of material that is relatively air impermeable but moisture vapor permeable, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.

B. Weather-Resistant Barrier (WRB): Water-shedding barrier made of material that is moisture-resistant, installed to shed water, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.

C. Rough Openings: Openings in the wall to accommodate windows and doors.

D. Material Transitions: Areas where the WRB / AB coated fiberglass-mat gypsum sheathing connects to beams, columns, slabs, parapets, foundation walls, roofing systems, and at the interface of dissimilar materials.

1.4 REFERENCE STANDARDS


SECTION 07250 - GYPSUM BOARD WEATHER-RESISTANT BARRIER AND AIR BARRIER SYSTEM


L. ICC ES AC212 Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing.


1.5 SUBMITTALS

A. Submittals: Submit in accordance with Division 1 requirements.

B. Product Data and Installation Instructions: Submit manufacturer's product data including sheathing and accessory material types, composition, descriptions and properties, installation instructions and substrate preparation recommendations.

C. Shop Drawings: Submit shop drawings indicating locations and extent of WRB / AB system, including details of typical conditions, special joint conditions, intersections with other building envelope systems and materials; counter flashings and details showing bridging of envelope at substrate changes, details of sealing penetrations, and detailed flashing around windows and doors.

D. Test Reports: Submit test reports indicating compliance with specified performance characteristics and requirements.

E. Sample warranty: Submit a sample warranty identifying the terms and conditions of the warranty as herein specified.
SECTION 07250 - GYPSUM BOARD WEATHER-RESISTANT BARRIER AND AIR BARRIER SYSTEM

F. Evaluation reports: Accredited laboratory testing for materials.

G. Installer Qualifications: Provide a letter from the manufacturer approving the installer for this project. Include a list of three (3) similar projects completed in the last three (3) years.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to perform Work of this Section who has specialized in installing exterior sheathing similar to that required for this Project; who is approved, authorized, or licensed by the sheathing system’s manufacturer to install manufacturer's product; and who is eligible to receive the manufacturer's warranty.

B. Preliminary Installation Conference: Before starting construction, conduct conference at Project site. Meet with the same participants and review the same items listed for the pre-installation conference. In addition, review status of submittals and coordination of work related to roof construction. Notify participants at least 5 working days before conference.

C. Pre-installation Conference: Before installing the system, conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Notify participants at least 5 working days before conference.

1. Meet with Owner; Architect; Owner's insurer, if applicable; testing and inspecting agency representative; sheathing installer; system manufacturer's representative; and installers whose work interfaces with the system.

2. Review methods and procedures related to the system’s installation, including manufacturer's written instructions.

3. Review flashings, special details and condition of other construction that will affect exterior sheathing.

4. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.

5. Review temporary protection requirements for the system during and after installation.

6. Review observation and repair procedures after installation.

7. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

8. Review all openings, sizes, and location.

9. If temperatures are forecasted to be below 40 degrees F, review procedures and requirements for storing and installing materials. Do not install products when temperatures are below freezing unless temporary enclosures and heating are provided.

1.7 WARRANTY

A. Provide manufacturer’s exposure warranty that offers twelve (12) months of coverage against in-place exposure damage (delamination, deterioration) beginning with the date of installation of the product.

B. Provide manufacturer's standard warranty for sheathing to be free of manufacturing defects that make it unsuitable for its intended use. Warranty period shall be Ten (10) years from the date of Purchase.
C. Installer’s Warranty: Provide an Installer’s Warranty for two (2) years from the date of Substantial Completion.

1.8 QUALITY ASSURANCE - MOCK UP

A. Provide a stand-alone WRB / AB sheathing wall with sealed joints and penetrations in a 4’ x 8’ mock-up sample wall showing base flashings, inside corner and window/door details. A portion of the proposed project’s wall can be used if applicable and approved by the Architect. The product’s manufacturer shall review and approve the mock-up wall and details prior to requesting review and approval by the Architect.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store WRB / AB coated fiberglass mat gypsum sheathing under cover and keep dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack sheathing flat and supported on risers on a flat platform to prevent sagging.

B. Protect fluid applied material, primers and accessory materials from damage, weather, excessive temperatures and construction traffic.

C. Store fluid applied material and primers at temperatures of 40 degrees F or above.

D. Apply fluid applied material to clean surfaces free of contaminants. Chemical residues, surface coatings or films may adversely affect adhesion. Pressure-treated wood and other contaminated surfaces should be cleaned with a solvent wipe before application.

1.10 FIELD CONDITIONS

A. Application standards where applicable are in accordance with Gypsum Association Publication GA-253 for gypsum sheathing and ASTM C1280.

B. Do not install sheathing that is moisture damaged. Indications that panels are moisture damaged include, but not limited to, discoloration, sagging, or irregular shape.

C. Allow installed sheathing to be dry to the touch before sealing joints, penetrations, rough openings, and material transitions.

D. Do not attempt to seal joints, corners, penetrations, rough openings, and material transitions when installed sheathing surface is frozen or has frost on the surface.

E. Do not apply sealing materials to sheathing when air or surface temperature is below 40F for fluid applied materials.

F. Sequencing. Do not install air barrier material before the roof assembly has been sufficiently installed to prevent a buildup of water in the interior of the building.
SECTION 07250 - GYPSUM BOARD WEATHER-RESISTANT BARRIER AND AIR BARRIER SYSTEM

G. Compatibility. Do not allow air barrier materials to come in contact with chemically incompatible materials.

H. Ultra-violet exposure. Do not expose air barrier materials to sunlight longer than as recommended by the material manufacturer.

PART 2 PRODUCTS

2.2 WEATHER BARRIER ASSEMBLIES

A. The Basis of design for this system is DensElement Barrier System as manufactured by Georgia-Pacific Gypsum, LLC. Approved equal manufacturer's will be considered in accordance with Specification Section 01300 – Submittals.

1. Sheathing: DensElement or approved equal Sheathing.
2. Fluid-applied flashing materials: Fluid-applied flashing as approved by Georgia-Pacific Gypsum, LLC or approved equal's manufacturer.
3. Primers, backer rods and accessory materials: As approved by Georgia-Pacific Gypsum, LLC or approved equal.

B. System Description: Weather-Resistant Barrier and Air Barrier assembly installed at exterior stud walls under exterior cladding, consisting of the following components as herein specified:

2. Fluid-applied flashing to seal sheathing joints, inside and outside corners, penetrations, rough openings, and material transitions.
3. Primer to seal raw gypsum edges before applying fluid applied flashing.

2.2 WEATHER-RESISTANT BARRIER (WRB) AND AIR BARRIER (AB) GYPSUM SHEATHING

A. Description: Coated fiberglass mat gypsum sheathing with integral weather-resistant barrier (WRB) and air barrier (AB) complying with applicable requirements of ICC-ES AC212, ASTM E2178, ASTM E2357.

B. Vapor Permeability: When tested as system in accordance with ASTM E96 (water method) the WRB and AB system has a minimum vapor permeance of 20 perms with sealed joints and fasteners.

C. The WRB and Air Barrier Gypsum Sheathing has a moisture absorption rate < 6%.

D. Air Barrier performance requirements:

1. Air permeance of sheathing: Sheathing with an air permeability not greater than 0.001 cfm/ft2 (0.02L/s/m2) when tested in accordance with ASTM E2178.
SECTION 07250 - GYPSUM BOARD WEATHER-RESISTANT BARRIER AND AIR BARRIER SYSTEM

2. Air permeance of assembly: Assembly of sheathing and sealing components with an average air leakage not greater than 0.04 cfm/ft² (0.2L/s/m²) when tested in accordance with ASTM E2357.

2.3 FLUID-APPLIED FLASHING AND ACCESSORY MATERIALS FOR JOINTS, INSIDE AND OUTSIDE CORNERS, FASTENERS, ROUGH OPENINGS, AND MATERIAL TRANSITIONS

A. Substrate requirements:

1. Sheathing joint and transition gaps to receive fluid-applied flashing shall be less than 1/4" (6.4 mm).
2. Gaps that are more than 1/8" and less than 1/4" shall be filled with a backer rod to support the fluid applied flashing at the transition joint.
3. For gaps larger than 1/4" use fluid-applied flashing as approved by Georgia-Pacific Gypsum, LLC or approved equal.

B. Fluid applied flashing for panel joints, inside and outside corners, and penetrations

1. Description: Water based fluid applied flashing.
2. Properties:
   a. Acceptable substrate: Georgia-Pacific Gypsum LLC DensElement Sheathing or approved equal.
   b. Adhesion to fiberglass mat faced sheathing: No delamination from face of sheathing.
   d. Air permeance: meets 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
   e. Water vapor permeance: >10 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.
   f. Ultraviolet and weathering resistance: Approved for 12 months weather exposure.
   g. Comply with applicable requirements of AAMA 714

3. Primer: Provide primer to seal the cut edges of gypsum sheathing.

C. Fluid applied flashing for sealing fasteners:

1. Description: Water based fluid applied flashing.
2. Properties:
   a. Acceptable substrate: Georgia-Pacific Gypsum LLC DensElement Sheathing or approved equal.
   b. Adhesion to fiberglass mat faced sheathing: No delamination from face of sheathing.
   d. Air permeance: meets 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
e. Water vapor permeance: >10 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.
f. Ultraviolet and weathering resistance: Approved for 12 months weather exposure.
g. Comply with applicable requirements of AAMA 714.

D. Fluid applied flashing for sealing rough openings

1. Fluid applied flashing: Water based fluid applied flashing.
2. Primer: Water based primer to seal the cut edges of gypsum exposed in rough openings for windows and doors. Apply primer to raw gypsum board edges by brushing on a thin, uniform coat.
3. Properties:
   a. Acceptable substrate: Georgia-Pacific Gypsum LLC DensElement Sheathing or approved equal.
   b. Flashing adhesion to fiberglass mat faced sheathing: No delamination from face of sheathing.
   d. Flashing air permeance: meets 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
   e. Flashing water vapor permeance: >10 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.
   f. Ultraviolet and weathering resistance: Approved for 12 months weather exposure.
   g. Flashing comply with applicable requirements of AAMA 714.

E. Material transitions using fluid applied flashing:

1. Refer to substrate requirements for treatment of gaps as specified herein. Gaps from 1/8” to 1/4” shall be filled with a backer rod prior to applying fluid applied flashing. Gaps greater than 1/4” shall be sealed with fluid-applied flashing as approved by Georgia-Pacific Gypsum, LLC or approved equal.
2. Fluid applied flashing for material transitions: Water based fluid applied flashing.
3. Properties:
   a. Acceptable substrate: Georgia-Pacific Gypsum LLC DensElement Sheathing or approved equal.
   b. Adhesion to fiberglass mat faced sheathing: No delamination from face of sheathing.
   c. Applied wet film thickness: 16 mils
   d. Air permeance: 0.004 cubic feet per minute per square foot (0.02L/s/sq m), maximum, when tested in accordance with ASTM E2178
   e. Water vapor permeance: >10 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M
   f. Ultraviolet and weathering resistance: Approved for 12 months weather exposure
   g. Comply with applicable requirements of AAMA 714
PART 3 EXECUTION

3.1 PREPARATION
   A. Remove projections, protruding fasteners, loose or damaged sheathing material at edges of panel that might interfere with proper installation to seal joints, corners, fasteners, penetrations, openings, or material transitions.
   B. Wipe down the sheathing surface to receive sealing materials with a clean cloth.
   C. Ensure field conditions are met as outlined in Part 1 – General Requirements.

3.2 INSTALLATION OF WEATHER-RESISTANT BARRIER (WRB) AND AIR BARRIER (AB) SHEATHING
   A. WRB / AB Coated fiberglass mat sheathing:
      1. Install and fasten DensElement Sheathing or approved equal system according to manufacturer's detailed installation instructions
      2. Fastener and penetration treatment: Treat all countersunk fasteners (penetrating through the fiberglass mat) with specified fluid applied flashing used for sealing joints.

3.3 FLUID APPLIED FLASHING FOR SEALING SHEATHING JOINTS, INSIDE AND OUTSIDE CORNERS, FASTENERS, ROUGH OPENINGS, AND MATERIAL TRANSITIONS
   A. Sealing DensElement or approved equal Sheathing Joints using specified Fluid Applied Flashing
      1. Apply fluid applied flashing over the joint in a zig-zag or ribbon pattern dispensed from a tube type container. Cover a minimum of 1" on both sides of the joint.
      2. With a 4 or 6" straight edge knife or trowel, spread evenly over the sheathing joint.
      3. Apply at a rate to achieve a wet mil thickness of 16 mils over the entire joint area.
   B. Sealing DensElement or approved equal Sheathing Vertical Corners using specified Fluid Applied Flashing
      1. Prime exposed gypsum edges with specified primer.
      2. Apply fluid applied flashing over the inside and/or outside corner in a zig-zag or ribbon pattern dispensed from a tube type container. Cover a minimum of 2" on both sides of the corner.
      3. With a 4 or 6" straight edge knife or trowel, spread evenly over the sheathing corner.
      4. Apply at a rate to achieve a wet mil thickness of 16 mils over the corner area.
   C. Sealing DensElement or approved equal Sheathing Fasteners using specified Fluid Applied Flashing: Apply the fluid applied flashing material to fasteners, and wipe down with a straight edge tool; provide a minimum 16 mil thick coating over the fastener.
   D. Sealing DensElement or approved equal Sheathing Rough Openings using specified Fluid Applied Flashing.
SECTION 07250 - GYPSUM BOARD WEATHER-RESISTANT BARRIER AND AIR BARRIER SYSTEM

1. Prime exposed gypsum edges with specified primer
2. Apply a bead of fluid applied flashing into the entire width of the inside corners of the opening dispensed from a tube type container.
3. Apply fluid applied flashing onto:
   a. Sills of openings
   b. Jambs of openings
   c. Headers of openings
4. Apply fluid applied flashing 2" over the entire width of the opening sill, jamb, and header on exterior set windows and doors. Apply fluid applied flashing over the entire width of the opening sill, jamb, and header on interior set windows and doors. Apply in a zig-zag or ribbon pattern dispensed from a tube type container.
5. Apply fluid applied flashing over the sheathing adjacent to the opening sill, jamb, and header in a zig-zag or ribbon pattern dispensed from a tube type container. Cover a minimum of 2" of the sheathing surface adjacent to the opening.
6. With a 4 or 6" straight edge knife or trowel, spread fluid applied flashing over entire width of the sill, jamb, header, and sheathing surface adjacent to the opening.
7. Apply at a rate to achieve a wet mil thickness of 16 mils over the opening area.

E. Sealing DensElement or approved equal sheathing material transitions using specified Fluid Applied Flashing

1. Sheathing joint and transition gaps to receive fluid-applied flashing shall be less than 1/4" (6.4 mm).
2. For gaps larger than 1/4" use shall be sealed with fluid-applied flashing as approved by Georgia-Pacific Gypsum, LLC or approved equal
3. Gaps that are more than 1/8" and less than 1/4" shall be filled with a backer rod to support the fluid applied flashing at the transition joint.
4. If necessary, prime the adjacent material with primer per the material manufacturer's recommendations.
5. Apply fluid applied flashing over the sheathing and adjacent material in a zig-zag or ribbon pattern dispensed from a tube type container. Ensure the flashing is a minimum of 2" on each substrate material surface.
6. With a 4 or 6" straight edge knife or trowel, spread fluid applied flashing over material transition joint.
7. Apply at a rate to achieve a wet mil thickness of 16 mils.

3.4 SEALING EXTERIOR WALL PENETRATIONS

A. Exterior wall penetration shall be sealed to prevent air and water infiltration. Penetrations may be sealed with fluid applied flashing.

B. For round or square pipe/duct penetrations use specified fluid applied flashing, refer to DensElement or approved equal Barrier System Technical Guide for instructions for proper sealing.

3.5 FIELD QUALITY CONTROL
SECTION 07250 - GYPSUM BOARD WEATHER-RESISTANT BARRIER AND AIR BARRIER SYSTEM

A. Do not cover installed WRB / AB assembly until required inspections have been completed and installation has been accepted. Provide a Field Inspection Report by the Manufacturer’s representative following the Final Inspection and Acceptance. This shall be emailed to the Owner’s Representative and Architect prior to installing the finish veneer.

B. Where applicable, allow for owner’s inspection and air barrier testing and reporting.

3.6 PROTECTION

A. Protect WRB / AB assembly from damage during installation and during the construction period.

END OF SECTION
SECTION 07251 - SPRAYED-ON FIREPROOFING

1.1 GENERAL

A. Submittals: In addition to product data and manufacturer's certificates evidencing compliance of fireproofing with specifications for each sprayed-on fireproofing product indicated, submit the following:

1. Test reports for sprayed-on fireproofing from a qualified independent testing agency, employed and paid by Contractor or manufacturer, indicating proposed sprayed-on fireproofing products comply with specified requirements for physical properties.

2. Test reports for primers and other coatings on structural steel from a qualified independent testing agency, employed and paid by Contractor, indicating their compatibility with sprayed-on fireproofing as determined by testing per ASTM E 736 according to requirements for coating materials in UL "Fire Resistance Directory." Include verification that fireproofing manufacturer has not found primers or coatings to be incompatible with fireproofing.

B. Fire-Test-Response Characteristics: Provide sprayed-on fireproofing products identical to those used in assemblies tested for the following fire-test-response characteristics, per test method indicated below, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: As indicated by reference to fire-resistive designs tested per ASTM E 119 and listed in UL "Fire Resistance Directory," or in the comparable publication of another testing and inspecting agency acceptable to authorities having jurisdiction.

2. Surface-Burning Characteristics: As indicated for each sprayed-on fireproofing product required, tested per ASTM E 84.

C. Provide fireproofing products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.

1.2 PRODUCTS

A. Concealed Sprayed-On Fireproofing: For sprayed-on fireproofing concealed from view behind other construction when the Work is completed, provide products whose composition and physical properties comply with the following requirements:

1. Material Composition: Sprayed-fiber fireproofing consisting of factory-mixed, dry formulation of inorganic binders, mineral fibers, fillers, and additives conveyed in a dry state by pneumatic equipment and mixed with water at the spray nozzle to form a damp, as-applied product.

2. Physical Properties: Minimum values, unless otherwise indicated or higher values required to attain designated fire-resistance ratings, measured per standard test methods referenced with each property listed below:
a. Bond Strength: Shall meet the latest version of the Code. 430 psf as determined per ASTM E 736 by field testing sprayed-on fireproofing applied to flanges of wide-flange structural steel members on surfaces matching remainder of steel receiving fireproofing. If surfaces of structural steel receiving sprayed-on fireproofing are primed, perform series of bond tests specified in UL "Fire Resistance Directory" for coating materials. Minimum sprayed-on fireproofing thickness tested in laboratory shall be 0.75 inch.

b. Compressive Strength: 5.21 lbf per sq. inch as determined in the laboratory per ASTM E 761. Minimum sprayed-on fireproofing thickness tested shall be 0.75 inch and the minimum dry density shall be as specified, but not less than 15 pcf.

c. Corrosion Resistance: No evidence of corrosion as determined per ASTM E 937.

d. Deflection: No cracking, spalling, delamination or the like as determined per ASTM E 759.

e. Effect of Impact on Bonding: No cracking, spalling, delamination or the like as determined per ASTM E 760.

f. Air Erosion: Maximum weight loss of 0.025 gram per sq. ft. in 24 hours as determined per ASTM E 859. For laboratory tests, the minimum thickness is 0.75 inch, the maximum dry density is 15 pcf, test specimens are not prepurged by mechanically induced air velocities, and tests are terminated after 24 hours.

g. Dry Density: 15 pcf for average and individual densities regardless of density noted in referenced fire-resistive design, or greater if required for fire-resistance ratings indicated, as determined per ASTM E 605 or Appendix A "Alternate Method for Density Determination" of AWCI Technical Manual 12-A.

h. Minimum Average Thickness: As required for fire-resistive design indicated per the following criteria, but not less than 0.375 inch, as determined per ASTM E 605.

1) Where the referenced fire-resistive design lists a thickness of one inch or greater, the minimum allowable individual thickness is the design thickness minus 0.25 inch.

2) Where the referenced fire-resistive design lists a thickness of less than one inch but more than 0.375 inch, the minimum allowable individual thickness is the greater of 0.375 inch or 75 percent of the design thickness.

3) No reduction in average thickness is permitted for those fire-resistive designs rated at densities of less than 15 pcf.

i. Surface-Burning Characteristics: Maximum flame-spread value of 10 and smoke-developed value of 0.

3. Products: Subject to compliance with requirements, provide one of the following or approved equal:
SECTION 07251 - SPRAYED-ON FIREPROOFING

a. Sprayed-Fiber Fireproofing:
   1) Cafco Blaze-Shield, Isoltek International Corp.
   2) Cafco Deck-Shield, Isoltek International Corp.
   3) SprayDon Standard JN, Structural Coatings Inc.
   4) Or approved equal.

B. Auxiliary Fireproofing Materials: Provide auxiliary fireproofing materials that are compatible with sprayed-on fireproofing products and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in the fire-resistive designs indicated.

1. Substrate Primers: For use on each different substrate and with each different sprayed-on fireproofing product, provide primer complying either with requirements specified in UL "Fire Resistance Directory" for coating materials or one that is identical to those used in fire-rated assemblies.


C. Topcoats: Type as recommended by manufacturer of each fireproofing material required for applications indicated.

1.3 EXECUTION

A. Conduct tests according to sprayed-on fireproofing manufacturer's recommendations to verify that substrates are free of oil, rolling compounds, and other substances capable of interfering with bond where there is any doubt as to their presence.

B. Clean substrates of substances that could impair bond of fireproofing, including oil, grease, rolling compounds, incompatible primers, and loose mill scale.

C. Comply with fireproofing manufacturer's instructions for mixing materials, application procedures, and types of equipment used to convey and spray on fireproofing materials as required to achieve fire-resistance ratings indicated.

D. Apply concealed fireproofing in thicknesses and densities indicated, but not less than those required to achieve fire-resistance ratings designated for each condition and to comply with requirements for thickness specified above under "Products."

E. Field Quality Control: A qualified independent testing agency, employed and paid by Owner, will perform field quality-control testing in successive stages in areas of extent described below; do not proceed with fireproofing of next area until test results for previously completed fireproofing show compliance with requirements.

F. Remove and replace fireproofing where test results indicate that it does not comply with specified requirements for cohesion and adhesion or for density or both.

SPRAYED-ON FIREPROOFING
SECTION 07251 - SPRAYED-ON FIREPROOFING

G. Apply additional fireproofing per manufacturer's directions where test results indicate that the thickness does not comply with specified requirements.

H. Cleaning: Remove material over-spray and fall-out from surfaces of other construction and clean exposed surfaces to remove soiling.

END OF SECTION 07251
SECTION 07270 - FIRESTOPPING

1.1 GENERAL

A. System Performance Requirements: Provide firestopping systems that are produced and installed to resist the spread of fire, according to the Room Finish Schedule Fire Rating indicated. The system shall resist the passage of smoke and other gases.

1. Provide through-penetration firestop systems with F ratings indicated, as determined per ASTM E 814, but not less than the fire-resistance rating of the constructions penetrated.
2. Provide through-penetration firestop systems with T ratings as well as F ratings, as determined per ASTM E 814.
3. Provide joint sealants with fire-resistance ratings indicated, as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.
4. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
5. For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84.
6. Provide penetration firestopping with mold and mildew resistance rating of one (1) or less as tested per ASTM G21

B. Submittals: Provide a complete tested assembly of products with a specific tested assembly system. In addition, provide product data for each type of product in the assembly. Submit the following:

1. Certification by firestopping manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs) and are nontoxic to building occupants.
2. Shop drawings detailing materials, installation methods, and relationships to adjoining construction for each through-penetration firestop system, and each kind of construction condition penetrated and kind of penetrating item along with design designation of qualified testing and inspecting agency.
3. Product certificates signed by manufacturers of firestopping products certifying compliance of their products with specified requirements.
4. Product test reports from a qualified testing and inspecting agency evidencing compliance of firestopping with requirements based on comprehensive testing of current products. Test reports must indicate T and F ratings and all system performance requirements.

C. Fire-Test-Response Characteristics: Provide firestopping that complies with the following requirements and those specified under the "System Performance Requirements" paragraph:

1. Firestopping tests are performed by a qualified testing and inspecting agency, including UL, Warnock Hersey, or an approved equal agency performing testing and follow-up inspection services, that is acceptable to authorities having jurisdiction.
2. Through-penetration firestop systems are identical to those tested per ASTM E 814 under conditions where positive furnace pressure differential of at least 0.01 inch of water is maintained at a distance of 0.78 inch below the fill materials surrounding the penetrating items in the test assembly.

3. Fire-resistive joint sealant systems are identical to those tested for fire-response characteristics per ASTM E 119 under conditions where the positive furnace pressure differential is at least 0.01 inch of water, as measured 0.78 inch from the face exposed to furnace fire.

4. Ratings of Firestopping: As indicated by reference to designations of UL in their "Fire Resistance Directory" or by another qualified testing and inspecting agency.

1.2 PRODUCTS

A. Through-Penetration Firestop Systems: Comply with the following requirements in providing system components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating firestops under conditions of service and application, based on testing and field experience. Subject to compliance with requirements provide products manufactured by Hilti, 3M Fire Protection Products, STI – Specified Technologies, Inc., or approved equal.

1. Accessories: Provide the following components for each firestopping system as needed to install fill materials and to comply with "System Performance Requirements" paragraph:

   a. Permanent forming/damming/backing materials including the following:

      1) Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
      2) Joint fillers for joint sealants.

   b. Temporary forming materials.

   c. Substrate primers.

   d. Collars.

   e. Steel sleeves.

2. Fill Materials: Provide through-penetration firestop systems composed of the fill materials indicated below:


   c. Intumescent Putty: Nonhardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.

   d. Intumescent Wrap Strips: Single-component, elastomeric sheet with aluminum foil on one side.

   e. Job-Mixed Vinyl Compound: Prepackaged vinyl-based powder product for mixing with water at Project site to produce a paintable compound, passing ASTM E 136, with flame-spread and smoke-developed ratings of zero per ASTM E 84.
f. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogenous mortar.

g. Pillows/Bags: Re-usable, heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.

h. Silicone Foam: Two-component, silicone-based liquid elastomer that, when mixed, expands and cures in place to produce a flexible, nonshrinking foam.


k. Mineral Wool Insulation (ASTM C 518): 4pcf actual density; .23 BTU in/hr SF 24°F; 4.3 R value; 0 Flame; 0 Smoke Developed.

l. Drop-In Firestop Devices: Factory-assembled devices for use with combustible or noncombustible penetrants in cored holes within concrete floors. Device shall consist of galvanized steel sleeve lined with an intumescent strip, an extended rectangular flange attached to one end of the sleeve for fastening to concrete floor, and neoprene gasket

B. Fire-Resistive Elastomeric Joint Sealants: Chemically curing, elastomeric sealants of base polymer indicated complying with ASTM C 920 requirements and requirements specified in this Section applicable to fire-resistive joint sealants.

1. Sealant Colors: Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

2. Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) O.

   a. Additional capability, when tested per ASTM C 719, to withstand the following percentage changes in joint width as measured at time of installation and still comply with other requirements of ASTM C 920:

   1) 100 percent movement in extension and 50 percent movement in compression for a total of 150 percent movement.

3. Multicomponent, Nonsag, Urethane Sealant: Type M; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, A, and (as applicable to joint substrates indicated) O.

   a. Additional capability, when tested per ASTM C 719, to withstand the following percentage changes in joint width as measured at time of installation and still comply with other requirements of ASTM C 920:

   1) 50 percent movement in both extension and compression for a total of 100 percent movement.
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4. Single-Component, Nonsag, Urethane Sealant: Type S; Grade NS; Class 25; and Uses NT, M, A, and (as applicable to joint substrates indicated) O.

1.3 EXECUTION

A. Install through-penetration firestops to comply with the "System Performance Requirements" paragraph and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.

B. Install fire-resistive joint sealant to comply with the "System Performance Requirements" paragraph, with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.

END OF SECTION 07270
SECTION 07412 – ALUMINUM COMPOSITE METAL WALL PANELS

PART 1 - GENERAL

1.1 SCOPE

A. Section Includes

1. The extent of panel system work is indicated on the drawings and in these specifications.
2. Panel system requirements include the following components:
   a. Aluminum faced composite panels with mounting system. Panel mounting system including anchorages, shims, furring, fasteners, gaskets and sealants, related flashing adapters, and masking (as required) for a complete watertight installation.
   b. Parapet coping, column covers, soffits, sills, border, and filler items indicated as integral components of the panel system or as designed.
   c. Interior panel system work that basically matches exterior panel system work.

B. Related Documents

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, and Technical Specification Divisions 2 through 16 apply to this Section.

1.2 QUALITY ASSURANCE

A. Quality Assurance Requirements

1. Composite Panel Manufacturer shall have a minimum of 5 years experience in the manufacturing of this product.
2. Composite Panel Manufacturer shall be solely responsible for panel manufacture and application of the finish.
3. Fabricator/installer shall be acceptable to the composite panel manufacturer.
4. Fabricator/Installer shall have a minimum 5 years experience of metal panel work similar in scope and size to this project.
5. Field measurements should be taken prior to the completion of shop fabrication whenever possible. However, coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of work. Field fabrication may be allowed to ensure proper fit. However, field fabrication shall be kept to an absolute minimum with the majority of the fabrication being done under controlled shop conditions.
6. Shop drawings shall show the preferred joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on the inside face of the panel system as determined by ASTM E 331. Systems not utilizing a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated System) shall provide a means of concealed drainage with baffles and weeps for water which may accumulate in members of the system.
7. Maximum deviation from vertical and horizontal alignment of erected panels: 6mm (1/4”) in 6m (20’) non-accumulative.
8. Panel fabricator/installer shall assume undivided responsibility for all components of the exterior panel system including, but not limited to attachment to sub-construction, panel to panel joinery, panel to dissimilar material joinery, and joint seal associated with the panel system.

9. Composite panel manufacturer shall have established an Installer Certification Program which by the installation company is pre-qualified.

1.3 REFERENCES

A. Aluminum Association
1. AA-C22-A41: Anodized - Clear Coatings.

B. American Architectural Manufacturers Association
1. AAMA 508-05: Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems

C. American Society For Testing And Materials
1. E 330 Structural Performance of Exterior Windows, Curtain Walls, and Doors Under the Influence of Wind Loads
2. E 283 Rate of Leakage through Exterior Windows, Curtain Walls, and Doors
3. D 1781 Climbing Drum Peel Test for Adhesives
4. E 84 Surface Burning Characteristics of Building Materials
5. D 3363 Method for Film Hardness by Pencil Test
7. D 3359 Methods for Measuring Adhesion by Tape Test
10. D 822 Practice for Operating Light and Water Exposure Apparatus (Carbon-Arc Type) for Testing Paint, Varnish, Lacquer, and Related Products
14. D 635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

1.4 SUBMITTALS

A. Submittals shall be in conformance with Section 01300 - Submittals.

B. Samples
1. Panel System Assembly: Two samples of each type of assembly. 304mm (12") x 304mm (12") minimum.
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2. Two samples of each color or finish selected, 76mm (3") x 102mm (4") minimum.

C. Shop Drawings: Submit shop drawings showing project layout and elevations; fastening and anchoring methods; detail and location of joints, sealants, and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.

D. Affidavit Certifying Material Meets Requirements Specified.

E. Two copies of manufacturer’s literature for panel material.

F. Provide a certification letter from the composite panel manufacturer stating that the installer is qualified perform this job specific project.

1.5 DELIVERY, STORAGE AND HANDLING

A. Protect finish and edges in accordance with panel manufacturer’s recommendations.

B. Store material in accordance with panel manufacturer’s recommendations.

PART 2 - PRODUCTS

2.1 PANELS

A. Composite Panels

1. The Basis of design is ALUCOBOND material manufactured by Alcan Composites USA, Inc. 208 West 5th Street, Benton, KY 42025 (800-626-3365 or 270-527-4200)

2. Approved equal manufacturers will be considered in accordance with Specification Section 01300 – Submittals.

B. Thickness: 4MM

C. Product Performance

1. Bond Integrity:

   a. When tested for bond integrity, in accordance with ASTM D1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin nor b) cohesive failure of the core itself below the following values:

   b. Peel Strength: 115 N mm/mm (22.5 in lb/in) as manufactured, 115 N mm/mm (22.5 in lb/in) after 21 days soaking in water at 70°F

2. Fire Performance:

   a. ASTM E 84 Flame Spread Index must be less than 25, Smoke Developed Index must be less than 450.

   b. ASTM D 1929 A self ignition temperature of 650°F or greater
c. ASTM D-635 Requires a CC1 classification

D. Finishes

1. Coil coated KYNAR® 500 or HYLAR® 5000 based Polyvinylidene Fluoride (PVDF) or Fluoro Ethylene – Alkyl Vinyl Ether (FEVE) resin in conformance with the following general requirements of AAMA 2605.

   a. Color: Standard color as selected by the owner / architect / engineer from manufacturer’s standard color palette.
   b. Coating Thickness: Colors - 1.0 mil (±0.2 mil).
   d. Impact:

      1) Test method: ASTM D-2794; Gardner Variable Impact Tester with 5/8” mandrel.
      2) Coating shall withstand reverse impact of 1.5”/pounds per mil substrate thickness.
      3) Coating shall adhere tightly to metal when subjected to #600 Scotch Tape pick-off test. Slight minute cracking permissible. No removal of film to substrate.

   e. Adhesion:

      2) Coating shall not pick off when subjected to an 11” x 11” x 1/16” grid and taped with #600 Scotch Tape.

   f. Humidity Resistance

      1) Test Method: ASTM D-2247.
      2) No formation of blisters when subject to condensing water fog at 100% relative humidity and 100°F for 4000 hours.

   g. Salt Spray Resistance:

      1) Test Method: ASTM B-117; Expose coating system to 4000 hours, using 5% NaCl solution.
      2) Corrosion creepage from scribe line: 1/16” max.
      3) Minimum blister rating of 8 within the test specimen field.

   h. Weather Exposure

      1) Outdoor:
          a. Ten-year exposure at 45° angle facing south Florida exposure.
          b. Maximum color change of 5 Delta E units as calculated in accordance with ASTM D-2244.
          c. Maximum chalk rating of 8 in accordance with ASTM D-4214.
          d. No checking, crazing, adhesion loss.

   i. Chemical Resistance:
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1) ASTM D-1308 utilizing 10% Muriatic Acid for an exposure time of 15 minutes. No loss of film adhesion or visual change when viewed by the unaided eye.

2) ASTM D-1308 utilizing 20% Sulfuric Acid for an exposure time of 18 hours. No loss of film adhesion or visual change when viewed by the unaided eye.

3) AAMA 2605 utilizing 70% reagent grade Nitric Acid vapor for an exposure time of 30 minutes. Maximum color change of 5 Delta E units as calculated in accordance with ASTM D-2244.

2. Urethane Coating: For small quantity aluminum accent panels or custom color applications, provide a multi coat urethane finish in accordance with the paint manufacturer’s requirements.

2.2 PANEL FABRICATION

A. Composition: Two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials. The core material shall be free of voids and/or air spaces and not contain foamed insulation material. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.

B. Aluminum Face Sheets:

1. Thickness: 0.50mm (0.0197”) (nominal)
2. Alloy: AA3000 Series (Painted material) AA5000 Series (Anodized material)

C. Panel Weight:

1. 4mm (0.157”): 1.12 lbs./ft²

D. Tolerances

1. Panel Bow: Maximum 0.8% of any 1828mm (72”) panel dimension.
2. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.
3. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
4. Maximum deviation from panel flatness shall be 1/8” in 5’0” on panel in any direction for assembled units. (Non-accumulative - No Oil Canning)

E. System Characteristics

1. Plans, elevations, details, characteristics, and other requirements indicated are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable, provided their details and characteristics comply with size and profile requirements, and material/performance standards.
2. System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.
3. System shall comply with the applicable provisions of the “Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual” by AAMA and ANSI/AAMA 302.9 requirements for aluminum windows.

4. Fabricate panel system to dimension, size, and profile indicated on the drawings based on a design temperature of 70°F.

5. Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight.

6. The finish side of the panel shall have a removable plastic film applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

F. System Type

1. The Basis of Design shall be AMD Series 2000 rout and return dry joint system.
2. Approved equal systems will be considered in accordance with Section 01300 – Submittals.

G. System Performance

1. Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Architect and/or the local building code.

   a. Wind Load – 95 MPH

      If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:

      Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E330 to obtain the following results.

      Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or 3/4”, whichever is less.

      Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span.

      Maximum anchor deflection shall not exceed 1/16”.

      At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16”.
b. Air/Water System Test

If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:

Air Infiltration - When tested in accordance with ASTM E283, air infiltration at 1.57 psf must not exceed 0.06 cfm/ft² of wall area.

Water Infiltration - Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 psf after 15 minutes of exposure in accordance with ASTM E331.

c. Pressure Equalized Rain Screen Systems shall comply with AAMA 508-05 Voluntary

Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems

H. ACCESSORIES

1. Extrusions, formed members, sheet, and plate shall conform with ASTM B209 and the recommendations of the manufacturer.

2. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.

3. Sealants and gaskets within the panel system shall be as per manufacturer’s standards to meet performance requirements.

4. Fabricate flashing materials from 0.030” minimum thickness aluminum sheet painted to match the adjacent curtain wall / panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.

5. Fasteners (concealed/exposed/non-corrosive): Fasteners as recommended by panel manufacturer. Do not expose fasteners except where unavoidable and then match finish of adjoining metal.

PART 3 - EXECUTION

3.1 INSPECTION

A. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.
SECTION 07412 – ALUMINUM COMPOSITE METAL WALL PANELS

B. Surfaces to receive panels shall be structurally sound as determined by a registered Architect/Engineer.

3.2 INSTALLATION

A. Erect panels plumb, level, and true.

B. Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20°F to +180°F. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted. Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation.

C. Panels shall be erected in accordance with an approved set of shop drawings.

D. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.

E. Conform to panel fabricator’s instructions for installation of concealed fasteners.

F. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraised, and broken members.

G. Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for refabrication, if possible, or for replacement with new parts.

H. Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

I. Installation must be performed by a prequalified installation firm from the fabricator.

3.3 ADJUSTING AND CLEANING

A. Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement shall become the responsibility of the Contract.

B. Repair panels with minor damage.

C. Remove masking (if used) as soon as possible after installation. Masking intentionally left in place after panel installation on an elevation, shall become the responsibility of the Contract.

D. Any additional protection, after installation, shall be the responsibility of the Contract.

E. Make sure weep holes and drainage channels are unobstructed and free of dirt and sealants.
F. Final cleaning shall not be part of the work of this section.

END OF SECTION
SECTION 07530 – EPDM ROOF

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. “Or Equal” Roof System: The Contractor will use the system described under Part 2 product section insure the physical characteristics of the submitted product meet the requirements of the specification.

1.2 SUMMARY

A. This Section includes the following:

1. JM EPDM NR FIT Fully adhered roof system or Firestone RubberGard Platinum™ Fully Adhered Roofing System or approved equal.
2. Roof expansion assemblies.
3. Roofing Insulation.
4. Cover Board
5. Roof flashings and counter flashings.
6. .090 non-reinforced EPDM roof membrane
7. Walkways.

1.3 PERFORMANCE REQUIREMENTS

A. General: Install a watertight, modified bituminous membrane roofing and base flashing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.

1. Roofing system shall comply with the following:

   a. 100 mile per hour wind speed in 3 second gusts.
   b. IBC 2015 building code compliance, NJ edition

1.4 SUBMITTALS

Provide one complete roof system shop drawing with an index, table of contents, and all related products.

A. Product Data: For each type of roofing product specified. Include data substantiating that materials comply with requirements.

B. Shop Drawings: Include plans, sections, details, and attachments to other work, for the following:

1. Base flashings and membrane terminations.
2. Flat and tapered insulation, including finished slopes at a minimum ¼” per foot.
3. Crickets, saddles, and tapered edge strips, including slopes.
C. Samples for Verification: Of the following products:

1. 12-by-12-inch (300-by-300-mm) square of non-reinforced EPDM
2. 12-by-12-inch (300-by-300-mm) square of roofing insulation.
3. 12-by-12-inch (300-by-300-mm) square of walkway pads.
4. 6 insulation fasteners of each type, length, and finish.
5. Flashing and counter flashing.

D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, and licensed by manufacturer to install specified roofing system and is eligible to receive the no dollar limit roofing manufacturer's warranty.

E. Manufacturer Certificates: Signed by roofing system manufacturer certifying that the roofing system complies with requirements specified in the "Performance Requirements" Article. Upon request, submit evidence of complying with requirements.

F. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

G. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of components of roofing system with requirements based on comprehensive testing of current product compositions.

H. Research/Evaluation Reports: Evidence of roofing system's compliance with building code in effect for Project from a model code organization acceptable to authorities having jurisdiction.

I. Maintenance Data: For roofing system to include in the maintenance manuals specified in Division 1.

J. Warranty: Sample copy of no dollar limit roofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty. Provide sample of the Installer's Warranty.

K. Inspection Report: Copy of roofing system manufacturer's inspection report and a qualified independent testing agency's report of completed roof installation.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to perform Work of this Section who has specialized in installing roofing similar to that required for this Project; who is approved, authorized, and licensed by the roofing system manufacturer to install manufacturer's product; and who is eligible to receive the no dollar limit roofing manufacturer's warranty.
SECTION 07530 – EPDM ROOF

B. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7.

1. Corner Uplift Pressure: 52.6 lbf/sq. ft. (kPa/sq. m).
2. Perimeter Uplift Pressure: 33.8 lbf/sq. ft. (kPa/sq. m).
3. Field-of-Roof Uplift Pressure: 18.8 lbf/sq. ft. (kPa/sq. m).

C. Pre-installation Conference: Before installing roofing system, conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Notify participants at least 5 working days before conference.

1. Meet with Owner, Construction Manager, Architect; Owner's insurer, if applicable; testing and inspecting agency representative; roofing installer; roofing system manufacturer's representative; deck installer; and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods of removing the existing roofing and cover board. Examine existing roof deck structure, slope and area of replacing roofing for daily output.
3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and attachment to structural members.
5. Review loading limitations of deck during and after roofing.
6. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
7. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.
10. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.
11. Review all roofing openings, sizes, location, curb or post supports.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weather tight location to ensure no significant moisture pickup and maintain at a temperature exceeding roofing system manufacturer's written instruction. Store membrane and other sheet materials on pallets or other raised surfaces under a waterproof cover.

1. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.

B. Do not leave unused membrane and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 deg F (10 deg C).
C. Deliver and store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

D. Protect roofing insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

1. Insulation shipping wrap is not weather protection. Provide additional weather protection of insulation materials complying to manufacturer's written instruction and PIMA technical bulletin #109.

1.7 INSTALLER QUALITY ASSURANCE

A. The EPDM membrane roofing system must achieve a UL Class A.

B. Materials: All materials and adhesives must comply with New Jersey and local requirements limiting volatile organic compounds (VOC).

C. The manufacturer must have a minimum of 20 years experience in the manufacturing of vulcanized thermal set sheeting.

D. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.

E. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply EPDM roofing systems and having installed at least one (1) roofing application or similar systems of equal or greater size within one year.

F. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.

G. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the specifier's consideration.

H. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.
SECTION 07530 – EPDM ROOF

I. The roofing system manufacturer will provide, when the project is in progress, the following:

1. Keeping the Owner informed as to the progress and quality of the work as observed.
2. Provide job site inspections a minimum of four days per week.
3. Reporting to the Owner in writing, any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor’s attention.
4. Confirming, after completion of the project and based on manufacturer’s observations and tests, that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported.

1.8 JOB CONDITIONS, CAUTIONS AND WARNINGS

A. Refer to the manufacturer’s requirements. JM EPDM Application Guide for a 30-year no dollar limit Peak Advantage Guarantee or Firestone’s Application Guide for 30 Platinum warranty design requirements. Approved equal manufacturer’s will be considered in accordance with Specification Section 01300 – Submittals.

B. Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage and application of materials.

C. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.

D. When loading materials onto the roof, the Manufacturer’s Licensed Contractor must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.

E. Proceed with roofing work only when weather conditions are in compliance with the manufacturer’s recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer’s requirements and recommendations.

F. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.

G. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.

H. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.

I. New roofing shall be complete and weathertight at the end of the work day.
SECTION 07530 – EPDM ROOF

J. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

1.9 WARRANTY

A. Roofing Manufacturer’s Warranty: Provide a 30-year no dollar limit leak proof labor and material warranty by the roofing manufacturer from the date of substantial completion following approval by the roof manufacturer’s agent. The single source warranty shall include all roofing system products, all edge/coping metal products and all wall panels. The maximum wind speed coverage shall be peak gusts of 100 mph measured at 10 meters above ground level. Certification is required with the shop drawing submittal indicating the manufacturer has reviewed and agreed to such wind coverage. Warranty shall also include Manufacturer’s coverage for accidental puncture for the duration of the 30 year warranty.

B. Installer’s Warranty: Submit installer’s warranty letter, signed by the Installer, covering work of this section, including all roofing system components and all metal components for two (2) years from the date of Substantial Completion following approval by the roof manufacturer’s agent.

C. Pro-rated System Warranties shall not be accepted.

PART 2 - PRODUCTS

2.1 GENERAL

A. All components of the specified roofing system shall be products of Johns Manville (JM) or Firestone Building Products, LLC (Firestone) or approved equal.

B. Unless otherwise approved by the specifier and accepted by the membrane manufacturer, all products (including insulation, fasteners, fastening plates and edgings) must be manufactured and supplied by the roofing system manufacturer and covered by the warranty.

2.2 MEMBRANE

A. Furnish JM EPDM NR 90 mil - FIT non-reinforced EPDM or Firestone RubberGard 90 mil RubberGard Platinum™ Non-Reinforced EPDM. (Ethylene, Propylene, Diene Terpolymer) in the largest sheet possible. The membrane shall conform to the minimum physical properties of ASTM D4637, type 1. When a 10 foot wide membrane is to be used, the membrane shall be manufactured in a single panel with no factory splices to reduce splice intersections. Approved equal manufacturers will be considered in accordance with Specification Section 01300 – Submittals.

2.3 INSULATION MATERIALS
SECTION 07530 – EPDM ROOF

A. General: Provide preformed, roofing insulation boards that comply with requirements, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: Rigid, cellular Polyisocyanurate thermal insulation complying with ASTM C 1289, Class 1, Grade 2 (20 PSI) classified by facer type as follows:

1. Facer Type: Type II, felt or glass-fiber mat on both major surfaces. Finished slope is to be 1/4”:12”. Minimum thickness drains 3.5”.

2. Minimum long term thermal resistance (LTTR): 5.7 per inch determined in accordance with CAN/ULC 770 @ 75 degrees F.

3. Provide preformed saddles, cricket, tapered edge strips, and other insulation shapes where indicated or required for sloping to drain. No standing water shall be permitted and the Contractor shall provide this insulation as necessary.

C. Cover Board: ASTM C 1289, Type II, Class 4, Grade 1. 1/2” High-Density Polyisocyanurate Foam Core, or manufacturer’s approved cover board for the roof system.

1. Product: JM ProtectoR HD, 1/2” High-Density Polyiso Cover Board, Firestone 1/2” ISO Guard or approved equal.

2.4 ADHESIVES AND CLEANERS

All products shall be furnished by Johns Manville (JM) or Firestone Building Products, LLC (Firestone) or approved equal and specifically formulated for the intended purpose.

A. Bonding Adhesive: JM LVOC Membrane Adhesive or Firestone Single Ply LVOC Bonding Adhesive (or approved equal).

B. Splicing Cement: Splice Adhesive

C. Splice Tape and Primer: JM EPDM 4” Seam Tape Plus with Tape Primer (Low VOC) or Firestone QuickSeam 3” Tape and LVOC QuickPrime+ (or approved equal).

D. Cleaning Solvent: JM Weathered Membrane Cleaner or Firestone Clear Splice Adhesive (or approved equal).

E. External seam sealant: JM Single-ply LVOC caulk or Firestone Lap Sealant (or approved equal).

F. Sealer: Pourable Sealer

G. Reinforced Termination Strip: JM EPDM reinforced termination strip with tape (RTS) (or approved equal).
2.5 FASTENERS AND PLATES

To be used for mechanical attachment of insulation and to provide additional membrane securement:

A. Insulation Fastening Plates: a 3 inch diameter FM approved metal plate used for insulation attachment in conjunction with Heavy Duty Fastener must achieve a minimum pullout of 300 pounds for fully adhered roof systems. Comply with manufacturer’s recommendations for minimum quantity of pull out tests.

B. Seam Fastening Plates: A 2 inch diameter FM approved metal plate meeting corrosion resistance provisions in FMG 4470, designed for fastening membrane to substrate and acceptable to the membrane roof system manufacturer.

C. QuickSeam RPF Strip: a 6 inch wide, 100 foot long strip of RubberGard reinforced EPDM membrane.

The 6 inch wide QuickSeam shall be utilized horizontally or vertically (in conjunction with Seam Fastening Plates) below the EPDM membrane for additional membrane securement.

2.6 METAL EDGING AND MEMBRANE TERMINATIONS

A. JM Presto-Tite Edge One Fascia or Firestone AnchorGard (or approved equal): a metal fascia system with an extruded aluminum anchor bar and 0.050 inch thick aluminum fascia. Metal fascia color shall be as designated by the Owner’s Representative or to match existing.

B. JM Presto-Lock Coping or Firestone Coping (or approved equal): incorporates a 20 gauge galvanized steel anchor clips with 4, a concealed joint cover and 10 foot continuous sections of coping cap. Metal coping cap color shall be as designated by the Owner’s Representative.

C. Manufacturer’s Termination Bar: a 1 inch wide and .106 inch thick extruded aluminum bar pre-punched 6 inches on center; incorporates a sealant ledge to support AP Sealant and provide increased stability for membrane terminations.

D. All metal coping / edge system to meet ANSI / SPRI ES-1 wind design standard.

2.7 WALKWAYS

A. Protective surfacing for roof traffic shall be provided by the manufacturer, factory formed, nonporous, heavy duty, slip resistant surface textured walkway pads sourced from the roofing system manufacturer. The pad shall be installed in accordance with the manufacturer’s installation requirements to resist wind blow off. Provide walk pads from the roof access point or hatch to each mechanical unit and around each mechanical unit in accordance with the equipment service requirements.
SECTION 07530 – EPDM ROOF

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions under which roofing will be applied, with Installer present, for compliance with requirements.

B. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.

C. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thicknesses of insulation required.

   1. Verify that wood nailer strips are located perpendicular to roof slope and are spaced according to requirements of roofing system manufacturer.

D. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.5 mm) out of plane.

E. Verify that all abandoned equipment, dunnage, vents, pipes, pitch pockets, etc. have been removed and the deck patched.

3.2 PREPARATION

A. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast. Verify that all roof drains are connected to roof drainage system.

B. Inspect the deck to verify integrity. Bring any areas of questionable integrity to the Architect’s attention. Do not cover any areas of questionable welds or deck out of plane.

3.3 INSULATION AND COVER BOARD INSTALLATION

A. Comply with roofing system manufacturer's written instructions for installing roofing insulation. Do not install more cover board than can be covered with roofing material the same day.

B. Comply with membrane roofing system manufacture written instructions for installing insulation.

C. Install insulation with long joints of insulation in continuous straight lines with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

   1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

D. Install new tapered insulation crickets where designated but between all drains and scuppers.
E. Mechanically fasten common fastener through tapered insulation system and base layer insulation to roof deck using proper manufactures fasteners.

1. Fasten at the rate of 16 fasteners per 4’x 8’ in the field of the roof, 24 fasteners per 4’x 8’ in the perimeter of the roof and 32 fasteners per 4’x 8’ in the corner of the roof.

F. Adhere Cover board: Install cover board and secure to tapered system insulation using twin pack adhesive.

1. Adhere the bead spacing at the rate of 12” apart in the field for a 4’ x 4” board, 6’ apart in the perimeter for a 4’ x 4’ board and 4” apart in the corner for a 4’ x 4’ board on the roof

3.4 ROOFING MEMBRANE INSTALLATION, GENERAL

G. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.

H. Where roof slope exceeds 1/2 inch per 12 inches (1:24), contact the membrane manufacturer for installation instructions regarding installation direction and backnailing.

I. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

J. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.

1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.

2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

3. Remove and discard temporary seals before beginning work on adjoining roofing.

3.5 MEMBRANE PLACEMENT AND BONDING

A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.

B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.

1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
2. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.

C. Install adjoining membrane sheets in the same manner, overlapping edges approximately 4 inches. Do not apply bonding adhesive to the splice area.

3.6 MEMBRANE SPLICING (Factory Applied Tape Splice)

A. Overlap adjacent sheets and mark a line out from the top sheet as recommended by roof manufacturer.

B. Fold the top sheet back and clean the dry splice area of membrane sheet with Sure-Seal Primer as required by the membrane manufacturer.

C. Position 4” JM Tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch.

D. Install additional 6” EPDM Peel & Stick Sealing Strip over seam as outlined in the manufacturer’s 30 year detail requirements.

E. Remove the release film and press the top sheet onto the tape using hand pressure.

F. Roll the seam toward the splice edge with a 2 inch wide steel roller.

3.7 FLASHING

A. Wall and curb flashing shall be cured EPDM membrane. Mechanically fasten 6” wide Strip at 12” on center in accordance with manufacturer’s recommendations. Continue the deck membrane as wall flashing where practicable.

B. Follow manufacturer’s Platinum flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.8 WALKWAYS

A. Install walkways at all traffic concentration points such as roof hatches, access doors, rooftop ladders, etc. Provide walk pads from the roof access point or hatch to each mechanical unit and around each mechanical unit in accordance with the equipment service requirements.

B. Install walk pads to the EPDM membrane in accordance with the manufacturer’s requirements to resist wind blow-off.

3.9 DAILY SEAL

A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
SECTION 07530 – EPDM ROOF

B. Manufacturer's Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

3.10 PROTECTION AND CLEANING

A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

C. Protect roofing system from damage and wear during remainder of construction period.

D. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

E. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.11 FIELD QUALITY CONTROL

A. The roofing contractor shall employ and pay for a qualified inspection agent for daily inspection work for this project, 3 days per week minimum or daily as required for the warranty to be provided. A weekly report shall be emailed weekly to the CM, Architect and Owner for their records. See Specification Section 01400, Quality Control for details.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to the CM, Architect and Owner.

1. Notify CM, Architect and Owner 48 hours in advance of the date and time of inspection.

C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.13 ROOFING INSTALLER'S WARRANTY

A. WHEREAS <NAME> of <ADDRESS>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner:
2. Address:
3. Building Name/Type:
4. Address:
5. Area of Work: As per the Construction Documents.
6. Acceptance Date:
7. Warranty Period: Twenty (20 years)
8. Expiration Date:

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
   a. lightning;
   b. peak gust wind speed exceeding 100 mph;
   c. fire;
   d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
   e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
   f. vapor condensation on bottom of roofing; and
   g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof has been paid by Owner or by another responsible party so designated.

3. The Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void, unless Roofing Installer, before starting
SECTION 07530 – EPDM ROOF

said work, shall have notified Owner in writing, showing reasonable cause for
claim, that said alterations would likely damage or deteriorate work, thereby
reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed and it becomes used
   for, but was not originally specified for, a promenade, work deck, spray-cooled
   surface, flooded basin, or other use or service more severe than originally
   specified, this Warranty shall become null and void on date of said change, but
   only to the extent said change affects work covered by this Warranty.

6. The Owner shall promptly notify Roofing Installer of observed, known, or
   suspected leaks, defects, or deterioration and shall afford reasonable opportunity
   for Roofing Installer to inspect work and to examine evidence of such leaks,
   defects, or deterioration.

7. This Warranty is recognized to be the only warranty of Roofing Installer on said
   work and shall not operate to restrict or cut off Owner from other remedies and
   resources lawfully available to Owner in cases of roofing failure. Specifically,
   this Warranty shall not operate to relieve Roofing Installer of responsibility for
   performance of original work according to requirements of the Contract
   Documents, regardless of whether Contract was a contract directly with Owner or
   a subcontract with Owner's General Contractor.

END OF SECTION 07530
SECTION 07620 – SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections apply to this section.

1.2 SUMMARY

A. Provide all labor, equipment, and materials to fabricate and install the following.

1. Edge strip and flashing.
2. Fascia, scuppers, and trim.
3. Expansion joint and area divider covers.
4. Fascia and edge metal.
5. Gutters, scuppers and down spouts.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy-Coated (galvannealed) by the Hot-Dip Process.

B. Warnock Hersey International, Inc., Middleton, WI (WH)

C. Factory Mutual Research Corporation (FMRC)

D. Underwriters Laboratories (UL)

E. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)


F. National Roofing Contractors Association (NRCA).

1. Roofing and Waterproofing Manual

G. Single Ply Roofing Institute (SPRI).

1. Wind Design Guide for Use with Low Slope Roofing
1.4 SUBMITTALS FOR REVIEW

A. Product Data:
   1. Provide manufacturer's specification data sheets for each product.
   2. Metal material characteristics and installation recommendations.
   3. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specified can be approved.

B. Samples: Submit two (2) samples, illustrating typical metal edge, coping, gutters, fascia extenders for material and finish.

C. Shop Drawings:
   1. For manufactured and shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
   2. Indicate material profile, jointing pattern, jointing details, fastening methods, flashing, termination's, and installation details.
   3. Indicate type, gauge and finish of metal.

D. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

1.5 SUBMITTALS FOR INFORMATION

A. Design and Test Reports: Provide the following certified test reports from an independent testing laboratory:
   1. Independent laboratory testing report for system design load and seam integrity.
   2. Professional engineer's documentation that system incorporates sufficient allowance for stress and movement.
   3. A letter from an officer of the manufacturing company certifying that the materials furnished for this project are the same as represented in tests and supporting data.
   4. Manufacturer's verifications that the panels are factory roll-formed.
   5. UL 1897: Test report must be submitted for windstorm rating no less than that specified in Design and Performance Criteria article. The proposed roof system must have approval over specified substrate with steel framing spaced no further apart than as specified.

B. Mill production reports certifying that the steel thicknesses are within allowable tolerances of the nominal or minimum thickness or gauge specified.

C. Qualification Data for Installer. Refer to Quality Assurance Article below.

D. Certification of work progress inspection. Refer to Quality Assurance Article below.

E. Certifications:
1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.

2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.6 CONTRACT CLOSEOUT SUBMITTALS

A. General: Comply with Requirements of Section 01700 – Contract Closeout.

B. Special Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.

C. Roofing Maintenance Instructions. Provide a manual of manufacturer’s recommendations for maintenance of installed roofing systems.

D. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.7 QUALITY ASSURANCE

A. Engage an experienced roofing contractor specializing in sheet metal flashing work with a minimum of five (5) years’ experience.

B. Maintain a full-time supervisor/foreman who is on the job-site at all times during installation. Foreman must have a minimum of five (5) years’ experience with the installation of similar system to that specified.

C. Source Limitation: Obtain components from a single manufacturer. Secondary products which cannot be supplied by the specified manufacturer shall be approved in writing by the primary manufacturer prior to bidding.

D. Upon request fabricator/installer shall submit work experience and evidence of financial responsibility. The Owner’s representative reserves the right to inspect fabrication facilities in determining qualifications.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.

B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials which may cause discoloration or staining.

1.9 PROJECT CONDITIONS

A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal edge system.
SECTION 07620 – SHEET METAL FLASHING AND TRIM

1.10 DESIGN AND PERFORMANCE CRITERIA

A. Thermal expansion and contraction:

1. Completed metal edge flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

B. ANSI/SPRI ES-1 tested and approved.


1.11 WARRANTIES

A. Owner shall receive one (1) warranty from manufacturer of roofing materials covering all of the following criteria. Multiple warranties are not acceptable.

1. Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.

2. Changes: Changes or alterations in the edge metal system without prior written consent from the manufacturer shall render the system unacceptable for warranty(ies).

3. Warranty shall commence on date of substantial completion or final payment, whichever is agreed by contract.

4. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

5. Installing roofing contractor shall be responsible for the installation of the edge metal system in general accordance with the membrane manufacturer’s recommendations.

6. Installing contractor shall certify that the edge metal system has been installed per the manufacturer’s printed details and specifications.

7. One manufacturer shall provide a single warranty for all accessory metal for flashings, metal edges and copings, along with the warranty for metal roof areas, membrane roof areas, and any transitions between two different material types.

PART 2 PRODUCTS

2.1 PRODUCTS, GENERAL

A. Refer to Division 01 Section “Common Product Requirements.”
SECTION 07620 – SHEET METAL FLASHING AND TRIM

B. Basis of Design: Materials, manufacturer’s product designations, and/or manufacturer’s names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.

1. Proposals shall be accompanied by a copy of the manufacturer’s standard specification section. That specification section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.

2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner’s Representative.

3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.

4. The Owner’s decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2 ACCEPTABLE MANUFACTURERS

A. The design is based upon sheet metal flashing and trim systems engineered and manufactured by or approved equal:

1. Garland Co., Inc. (The)
2. Tremco
3. Approved equal

2.3 MATERIALS

A. General: Product designations for the materials used in this section shall be based on performance characteristics of the R-MER Edge System manufactured by the Garland Company, Cleveland, OH, and shall form the basis of the contract documents. Substitutions will be approved in accordance with Specification Section 01300.

B. Materials:

1. Exposed base metal material:

2. Unexposed base metal material:
   a. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0299 nom. / 22 gauge; 36” to 48” by coil length, chemically treated, commercial or lock-forming quality.


C. Finishes:

1. Exposed surfaces for coated panels:
   a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer. Weathering finish as referred by National Coil Coaters Association (NCCA).

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Fluorocarbon*</th>
</tr>
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<tbody>
<tr>
<td>Pencil</td>
<td>ASTM D-3363</td>
<td>HB-H</td>
</tr>
<tr>
<td>Hardness</td>
<td>NCAA II-2</td>
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<tr>
<td>Bend</td>
<td>ASTM D-4145</td>
<td>O-T</td>
</tr>
<tr>
<td>Cross-Hatch Adhesion</td>
<td>ASTM D-3359</td>
<td>no loss of adhesion</td>
</tr>
<tr>
<td>Gloss (60° angle)</td>
<td>ASTM D-523</td>
<td>25+/-5%</td>
</tr>
<tr>
<td>Reverse Impact</td>
<td>ASTM D-2794</td>
<td>no cracking or loss of adhesion</td>
</tr>
</tbody>
</table>

Nominal Thickness:
- primer 0.2 mils
- topcoat 0.8 mils
- TOTAL 1.0 mils

*Subject to minimum quantity requirements

b. Include optional Aluminum Anodized finish for all exposed metal to match existing finishes.

c. Finish color to be selected by Owner from Manufacturer’s full range of standard and premium Fluorocarbon and Anodized finish color options.

2. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, shall be as shipped from the mill.
SECTION 07620 – SHEET METAL FLASHING AND TRIM

2.4 RELATED MATERIALS AND ACCESSORIES

A. Metal Primer: Zinc chromate type.
B. Plastic Cement: ASTM D 4586
C. Sealant: Specified in Section 07920 or on drawings.
D. Underlayment: ASTM D2178, No15 asphalt saturated roofing felt.
E. Downspout material to match existing (4” x 4” x 1/8”) thick mill finished aluminum.
F. Fasteners:
   1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.
   2. Fastening shall conform to Factory Mutual 1-90 requirements or as stated on section details, whichever is more stringent.
G. Downspout Anchorage Devices “See drawings for location of attachment (minimum of 2 per downspouts) and material type.
H. Scupper boxes are to be welded and post painted.

2.5 SOFFIT

A. Materials.
   1. Panel material:.032” thickness aluminum, 3105-H14 alloy, smooth as per ASTM B209-96.
   2. Flashing and flat stock material: Fabricate from .032” thick aluminum in profiles indicated on drawings of same material and finish as soffit system, unless indicated otherwise.

B. Finish on surfaces:
   1. Exposed surfaces for coated panels:
      a. Two coat coil applied, baked-on full-strength (70% resin) fluorocarbon coating system (polyvinylidene fluoride, PVF2), applied by manufacturer’s approved applicator.
      b. Coating system shall provide nominal one point zero (1.0) mil dry film thickness, consisting of primer and color coat.
      c. Color: Custom color selected by architect. Color shall be [specify color].
   2. Unexposed surfaces for coated panels shall be baked-on polyester coating with .20 - .30 dry film thickness (TDF).
C. Characteristics:

1. Fabrication: Panels shall be factory roll-formed from the specified metal. Field rolled panels will not be allowed.

2. Configuration: Interlocking flush/flat seams incorporating concealed screw type fastener. Concealed clip systems are not acceptable.

3. Panel width: twelve (12) inch nominal.

4. Panel lengths: Full length without joints to the extent as is practical. For lengths which exceed twenty-five (25) feet, shorter panels may be butted end-to-end (no overlap). End joints shall be staggered.

5. Panels shall have one (1) V-groove mechanically formed reveal at the center of the pan.

6. All panels shall be vented.

D. Accessories:

1. Fasteners:
   
a. Concealed fasteners: Corrosion resistant steel screws, #10 x 1" long, pancake head, Phillips drive. Use self-drilling, self-tapping for metal substrate or A-point for plywood substrate.

   b. Exposed fasteners: Series 410 stainless steel screws or one eighth (1/8) inch diameter stainless steel waterproof rivets. All exposed fasteners shall be factory painted to match the color of the soffit panels.

2. Provide all miscellaneous accessories for complete installation.

3. 3/4" high x 24 gauge (minimum) Galvalume steel furring hat sections to soffit structural substrate. Hat sections shall be installed perpendicular to panel seams, and shall be spaced 24" o.c. (maximum) to accommodate the panel fastener spacing given in section 3.2 C.

2.6 SNOW RETENTION SYSTEM FOR EXISTING STANDING SEAM METAL ROOFS

A. Roof Attachment Clamps: Provide aluminum standing seam roof clamp. Carbon steel or plastic parts are not acceptable. No fastener penetrations of the roof membrane will be permitted. Clamp to attach to the standing seam will have two stainless steel set screws (3/8" minimum diameter) having rounded point. One clamp shall be installed per standing seam for each row. Color to match roof.
B. Cross member: Extrusion with receptacle in face to provide for insert of color strip. Color strip is to be the same pre-finished material and originate from the same supplier as the roof panels. Cross member is to be continuous and include splice connectors to join adjacent sections, ensuring alignment and structural continuity. Cross member is attached to clamps using 3/8" diameter stainless steel bolts.

C. Snow/Ice Clips: "Snow Clips" are to be aluminum or stainless steel, with rubber "foot". Clip to attach to cross member and rest on panel flat, between panel seams to retard movement of snow/ice beneath cross member. Use one clip per panel.

PART 3 – EXECUTION

3.1 EXECUTION, GENERAL

A. Refer to Division 07 Section Common Work Results for Thermal and Moisture Protection.

3.2 PROTECTION

A. Isolate metal products from dissimilar metals, masonry or concrete with bituminous paint, tape, or slip sheet. Use gasketed fasteners where required to prevent corrosive reactions.

3.3 GENERAL

A. Secure fascia to wood nailers at the bottom edge with a continuous cleat.

B. Fastening of metal to walls and wood blocking shall comply with SMACNA Architectural Sheet Metal Manual, and manufacturer's recommendations whichever is the most stringent standard.

C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.

D. Allow sufficient clearances for expansion and contraction of linear metal components.

E. Secure metal using fasteners as required by the system. Exposed face fastening will be rejected.

3.4 INSPECTION

A. Verify that curbs are solidly set and nailing strips located.

A. Perform field measurements prior to fabrication.

B. Coordinate work with work of other trades.

C. Verify that substrate is dry, clean and free of foreign matter.
SECTION 07620 – SHEET METAL FLASHING AND TRIM

D. Commencement of installation shall be considered acceptance of existing conditions.

3.5 MANUFACTURED SHEET METAL SYSTEMS

A. Furnish and install manufactured fascia, fascia extender and coping cap systems in strict accordance with manufacturer's printed instructions.

B. Provide factory-fabricated accessories including, but not limited to, fascia extenders, miters, scuppers, joint covers, etc. Refer to Source limitation provision in Part 1.

3.6 SHOP-FABRICATED SHEET METAL (ACCESSORY TRIM & SCUPPER BOX)

A. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices. Fabricate scuppers as shown of drawing

B. Hem exposed edges.

C. Angle bottom edges of exposed vertical surfaces to form drip.

D. Lap corners with adjoining pieces fastened and set in sealant.

E. Install sheet metal to comply with referenced SMACNA and NRCA standards.

3.7 FLASHING MEMBRANE INSTALLATION

A. Scupper Through Roof Edge

1. Install lead coated copper scupper box in a one-quarter (1/4) inch bed of mastic. Assure all box seams are soldered and have minimum four (4) inch flange. Make sure all corners are closed and soldered.

2. Prime metal edge at a rate of one-hundred (100) square feet per gallon and allow to dry.

3. Fabricate scupper cover to wrap new lead coated copper scupper boxes on the outside. See detail for exact requirements

B. Snap On Facia Detail

1. Position base plies of the Modified Roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.

2. Install fascia extender cleat, facia extender, scupper boxes and miters first.

3. Cant Dam: Install Cant Dam with #10 fasteners six (6) inches on center through the top of metal flange and outside face.
4. Prime Cant Dam at a rate of one-hundred (100) square feet per gallon and allow to dry. Strip in Cant Dam with base flashing membrane extending six (6) inches into roof field, followed with a cap sheet extending nine (9) inches into the roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer’s recommendations. Attach top of flashing into cant dam 9” o. c. with pan head screw.

5. Fascia Cover: Install fascia cover with splice plate under one end by pressing downward firmly until “snap” occurs and cover is engaged along entire length of miter. Field cut where necessary with fine tooth saw. Sealant is to be placed between splice plates on metal edge pieces, one bead, approximately 1” in from fascia cover joint.

6. End caps are required at both sides of all scupper boxes. These must be pre-fabricated and provided by the manufacturer.

7. The bottom of the metal edge facia must line up with the top of the scupper. The facia extender shall extend as necessary to cover exposed blocking and top of brick.

C. Coping Cap Detail

1. Install miters first.

2. Position base flashing of the Built-Up and/or Modified Roofing membrane over the wall edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer’s recommendations.

3. Install minimum twelve (12) inch wide anchor chair at 30” on center.

4. Install 8” wide splice plate by centering over 12” wide anchor chair. Apply two beads of sealant to either side of the splice plate’s center. Approximately 2” in from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until “snap” occurs and hem is engaged on the entire chair.

D. Slip Flashing Detail

1. Install new slip flashing under existing metal and terminate with fasteners 8” on center incorporating neoprene washers.

2. All slip flashing shall be fabricated to mirror the substrate to which they are attached and include a hemmed drip edge.

E. Pitch Pocket

1. All pitch pockets are to be fabricated a minimum of 4” high and shall be fabricated from 16 oz copper, lead coated copper or stainless. All pitch pockets shall have closed corners and be soldered. Field soldering is required for the fourth corner.
3.8 SOFFIT INSTALLATION

A. All details will be shown on manufacturer's shop drawings to successful bidder; install soffit and flashings in accordance with approved shop drawings and manufacturer's product data, within specified erection tolerances.

B. Prepare soffit for the installation of panels, including:
   1. Install all sheathing, framing, and/or furring members as indicated in this specification and bid documents.
   2. Install all insulation, vapor retarder, and/or air infiltration barriers as indicated in this specification and bid documents.
   3. Install all temporary water proofing materials as required in this specification and bid documents.

C. Directly over the completed soffit substrate, install metal soffit panels. All panels will be fastened into the structural substrate with screw type fasteners at twenty-four (24) inches o.c. maximum spacing along each panel seam.

D. Seal laps and joints in accordance with roofing system manufacturer's product data.

E. Coordinate flashing and sheet metal work to provide weathertight conditions at soffit terminations. Fabricate and install in accordance with standards of SMACNA Manual.

F. Installed system shall be true to line and plane and free of dents, and physical defects. In light gauge panels with wide flat surfaces, some oil canning may be present. Oil canning does not affect the finish or structural integrity of the panel and is therefore not cause for rejection.

G. Form joints in linear sheet metal to allow for one quarter (1/4) inch minimum expansion at twenty (20) feet zero (0) inch on-center maximum and eight (8) feet zero (0) inch from corners.

H. At joints in linear sheet metal items, set sheet metal items in two (2) one quarter (1/4) inch beads of butyl sealant. Extend sealant over all metal surfaces. Mate components for positive seal. Allow no sealant to migrate onto exposed surfaces.

I. Remove damaged work and replace with new, undamaged components.

J. Touch up exposed fasteners using paint furnished by soffit panel manufacturer and matching exposed panel surface finish.

K. Clean exposed surfaces of soffit and accessories after completion of installation. Leave in clean condition at date of substantial completion. Touch up minor abrasions and scratches in finish.
3.9 SNOW RETENTION SYSTEM INSTALLATION

A. Layout: Carefully lay out desired assembly locations true-to-line prior to installing clamps or Versa brackets. Clamps shall avoid panel attachment clips if the clip is a single piece design.

B. Clamp Installation: Assemble set screws to clamp and clamp to seam following all manufacturers printed instructions. Both set screws are to be at the same side of clamp. When application relies upon tested load-to-failure values, manufacturer's minimum recommended set screw tension shall be randomly verified using calibrated torque wrench per manufacturer's instructions.

C. System Installation: Install snow retention assemblies straight and true-to-line. Secure all color strip material to ColorGard per manufacturer's instructions. Join adjacent sections with splice pieces provided. Do not cantilever cross member more than 6" past the last clamp in an assembly.

D. Fall Protection: Provide necessary fall and other hazard protection in accordance with OSHA regulations when installing snow retention assemblies.

E. Cleaning: Clean roof of any residual debris resulting from installation.

3.10 CLEANING

A. Clean installed work in accordance with the manufacturer’s instructions.

B. Replace damaged work than cannot be restored by normal cleaning methods.

3.11 CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated. Comply with requirements of authorities having jurisdiction.

3.12 FINAL INSPECTION

A. At completion of installation and associated work, meet with Contractor, Architect, installer, installer of associated work, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.

B. Inspect work and flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

C. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Notify the Architect upon completion of corrections.

E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.
SECTION 07620 – SHEET METAL FLASHING AND TRIM

F. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty-four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

3.13 DEMONSTRATION AND TRAINING

A. At a time and date agreed to by the Owner, instruct the Owner’s facility manager, or other representative designated by the Owner, on the following procedures:

1. Troubleshooting procedures.
2. Notification procedures for reporting leaks or other apparent roofing problems.
4. The Owner’s obligations for maintaining the warranty in effect and force.
5. The Manufacturer’s obligations for maintaining the warranty in effect and force.

END OF SECTION
SECTION 07720 - ROOF ACCESSORIES

1.1 GENERAL

A. Submittals: Per Conditions of Contract and Division 1.
B. Product data for each type of product specified.
C. Shop drawings showing fabrication and installation of each roof accessory specified.
D. Samples representing color, texture, shape, and sizes of each roof accessory specified.

1.2 PRODUCTS

A. Prefabricated Curbs and Equipment Supports: Comply with loading and strength requirements for units supporting other work. Coordinate with equipment to be supported.
   1. Fabricate of structural-quality, hot-dip galvanized or galvalume sheet steel, factory-primed and prepared for painting with welded or sealed mechanical corner joints.
   2. Provide complete with cant strips and base profile coordinated with roof insulation thickness. Provide preservative-treated wood nailers at tops of curbs, coordinate with thickness of insulation and roof flashing as indicated, tapered as necessary to compensate for roof deck slopes.
   3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Curbs, Inc.
      b. Custom Curb, Inc.
      c. The Pate Co.
      d. Roof Products and Systems Corp.
      e. ThyCurb Div./ThyBar Corp.
      f. Or approved equal.

B. Galvanized Steel Sheet: ASTM A 526 G 90 (ASTM A 526M, Z 275), commercial quality, or ASTM A 527, G 90 (ASTM A 527M, Z 275), lock-forming quality, hot dipped galvanized, mill phosphatized where indicated for painting; not less than 0.0396 inch (1.0 mm) thick, unless otherwise indicated.

C. Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the items indicated.

D. Roof Hatches:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
      a. Babcock-Davis Hatchways, Inc.
      b. Bilco Company
      c. Bristolite Skylights
      d. Custom Curb, Inc.
      e. Dur-Red Products, Inc.
2. General: Frame with minimum 12-inch high, integral-curb, double-wall construction with 1-1/2 inch (38-mm) insulation, formed cants and cap flashing (roofing counterflashings), with welded or sealed mechanical corner joints. Provide double-wall cover (lid) construction with 1-inch-(25mm) thick insulation core. Provide gasketing and equip with corrosion-resistant or hot-dip galvanized hardware including pindle hinges, hold-open devices, interior padlock hasps, and both interior and exterior latch handles.

   a. Fabricate units to withstand 40-lbf/sq. ft. (1.9-kPa) external and 20-lbf/sq. ft. (0.95-kPa) internal loading pressure.

3. Single-Leaf Personnel Hatches:

   a. Size: As indicated 30 x 36 inches for ladder access.
   b. Material: Manufacturer's standard
   c. Baked-Enamel Finish: Manufacturer's standard two-coat thermocured system.
      (i) Color and Gloss: As selected from manufacturer's full range.

4. Sloping Roofs: Where slope or roof deck exceeds 1/4 inch per foot (1:48), fabricate hatch curbs with height tapered to match slope to level tops of units.

E. Roof Hatch Safety Railing System: Provide for all existing roof hatches. Provide size to fit on all hatches by Nesea Corp or approved equal.

1. Product Model#: RHSS-SS
2. Product Description: Roof Hatch Safety Railing System for safe egress and ingress through roof type access hatches and for protection of roof opening while roof hatch is up. Meets OSHA Standard CFR 29 1910.23 and CFR 29 1910.27.
3. Product Selection Criteria: For roof hatches such as 2'6" x 3" and with hatchway ladder mounted on 2'6" side of hatch opposite of hatch lid hinge.
4. Type of Installation: Permanent bolt on installation of right and left handed railings, guard railings, mid railings and chain as per supplied instructions and hardware.
5. Materials:

   a. Flat bar: 2" x 3/8" thickness A36 mild steel.
SECTION 07720 - ROOF ACCESSORIES

b. Pipe: 1 1/4" ID A53 Grade B seamed steel.
c. Weld filler: Metal NR211 E70XX (AWS).
d. Finish: Galvanized (hot dipped).
e. Chain System: 3/16" proof coil ASTM specification, zinc plated with quick links and 2 1/2" zinc plated hoops on each end.
f. Pipe caps: weather and light resistant vinyl 1 1/2" deep and to fit snugly over pipe ends.
g. Bolts and washers: Hex head bolts 3/8" x 2 1/2" grade Z, zinc plated. Fender washers for inside of hatch curb and standard flat washers outside.
h. Railing clamps: Kee Klamp manufactured models 10-7 and 45-7 for 1 1/4" pipe.

6. Sealant for Brackets: Brackets shall be sealed per roof manufacturer's approved methods.
7. Labels: Safety no hoisting warning label, model and serial # label, manufacturer identification label, patent or patent pending label.
8. Warranty: 5 years manufacturer's parts only warranty.

F. Baked Enamel Finish: Thermosetting-modified acrylic enamel primer and topcoat system complying with AAMA 603.8, except with a minimum dry film thickness of 1.5 mils, medium gloss.

2. Color: As selected by Architect.

1.3 EXECUTION

A. Installation: Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units. Coordinate with vapor barriers, roof insulation, roofing and flashing installation to ensure that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses, as well as inward and outward loading pressures.

1. Except as otherwise indicated, install roof accessory items according to construction details of NRCA "Roofing and Waterproofing Manual."

B. Clean exposed metal and plastic surfaces according to manufacturer's instructions. Touch up damaged metal coatings.

END OF SECTION 07720
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes joint sealants for the following applications, including those specified by reference to this Section:
   1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
   2. Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1.2 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Preconstruction field test reports.

D. Compatibility and adhesion test reports.

E. Product test reports.

1.4 QUALITY ASSURANCE

A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

B. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates according to the method in ASTM C 1193 that is appropriate for the types of Project joints.
SECTION 07920 - JOINT SEALANTS

C. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

2. All test samples shall be approved and accepted by the Owner, Architect, Construction Manager and Manufacturer's field inspection personnel. Coordinate work and testing schedule with Manufacturer's field inspection personnel.

1.5 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Installers five (5) year workmanship warranty from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles or approved equal.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.
SECTION 07920 - JOINT SEALANTS

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Suitability for Immersion in Liquids. Where elastomeric sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.

D. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

E. Single-Component Neutral-Curing Silicone Sealant for all exterior and interior joints application except as listed for other applications:

1. Products:
   a. Dow Corning Corporation; 790.
   b. GE Silicones; SilPruf LM SCS2700.
   c. Tremco; Spectrem 1 (Basic).
   d. Or approved equal.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 100/50.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
7. Paintable surface.

F. Single-Component Neutral-Curing Silicone Sealant for structural glazing and aluminum framing:

1. Products:
   a. Dow Corning Corporation; 795.
   b. GE Silicones; UltraGlaze SSG4000.
   e. Tremco; Proglaze SG.
   f. Tremco; Tremasil 600.
   g. Or approved equal.
SECTION 07920 - JOINT SEALANTS

2. Type and Grade: S (single component) and NS (nonsag).
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.
6. Paintable surface.

G. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant for all interior wet areas including all ceramic tiles:

1. Products:
   a. Pecora Corporation; 898.
   b. Tremco; Tremsil 600 White.
   c. Or approved equal.

2. Type and Grade: S (single component) and NS (nonsag).
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.

2.4 ACOUSTICAL JOINT SEALANTS – For all interior paintable gypsum / wood joints.

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products:
   a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
   c. Or approved equal.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission for concealed gypsum / wood joints.

1. Products:
   a. Pecora Corporation; BA-98.
   b. Tremco; Tremco Acoustical Sealant.
   c. Or approved equal.

2.5 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
SECTION 07920 - JOINT SEALANTS

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), O (open-cell material), B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.

   a. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.

2. Remove laitance and form-release agents from concrete.
SECTION 07920 - JOINT SEALANTS

a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

B. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
4. Complete sealant all the way of the full joint length, everywhere.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
SECTION 07920 - JOINT SEALANTS

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

G. Installation of Preformed Silicone-Sealant System: Comply with manufacturer's written instructions.

H. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

I. Conditions that should be avoided when working with Silicone Building Sealant:
   1. **DO NOT** “wet tool” with solvents or soaps as this can inhibit the surface of this sealant, the rest of the sealant bulk may cure normally but the surface will remain tacky and gummy indefinitely.
   2. **DO NOT** apply this sealant to a backer rod that is contaminated with solvent or primer.
   3. **DO NOT** apply this sealant to a surface that has been cleaned with a solvent or primer.
   4. **DO NOT** apply this sealant to EPOXY containing surfaces (unless they have been tested by The Americas Construction Test Lab) since they can inhibit the cure.

J. Do not use silicone sealant for:
   1. Below-grade applications.
   2. Surfaces to be immersed in water for prolonged time.
   3. Brass and copper surfaces.
   5. Structural glazing and adhesive.
   6. Surfaces to be painted.
   7. Surfaces in direct contact with food.
   8. Medical and pharmaceutical applications.

K. Do not apply in totally confined spaces without ventilation for curing.

END OF SECTION 07920