COUNTY OF BUCKS

Doylestown, Pennsylvania

INVITATION TO BID

RESTORATION AND RENOVATION OF THE FARMHOUSE
FOR THE AFRICAN AMERICAN MUSEUM OF BUCKS COUNTY

Bucks County Commissioners
Robert J. Harvie Jr.,Chair
Diane M. Ellis-Marseglia LCSW, Vice Chair
Gene DiGirolamo, Secretary

Chief Clerk
Gail Humphrey

Solicitor
Joseph J. Khan, Esq.

Controller
Pamela Van Blunk

Director of Purchasing
Elizabeth A. Gates

Due Date: 11:15 AM July 25, 2022 Spec No.: 39-07/22

Construction- Bonds Required
Rev 4/2022

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SECTION 00 21 13 - INSTRUCTIONS TO BIDDERS

RESPONDING TO THIS BID

1. All sections of the electronic Bid, including downloads and RFI's shall be submitted with the bid and acknowledges the Bidder affirms, understands, and will abide by the requirements of the Bid. Failure to do so may cause the Bid to be rejected as non-responsive.
2. The submission of a bid will be considered as conclusive evidence of complete examination of specifications and samples.
3. The County of Bucks reserves the right to accept and award an Agreement to the lowest responsive, responsible bidder. The County reserves the right to reject any or all bids or any part thereof. The County reserves the right to award an Agreement based on evaluation of specific criteria found in these specifications.
4. No verbal instructions or information to bidders will be binding. The specifications will be considered clear and complete unless written attention is called to any apparent discrepancies or incompleteness thereof, before the opening of bids. Should any written inquires be received by the Commissioners, these inquiries will be answered in the form of addenda and issued to all providers. These addenda shall then be considered a part of these specifications.
5. Each bid must be submitted electronically by 11:15 A.M. on the day of the bid opening.
6. The bids will be opened and read publicly in Conference Room 557 on the 5th floor of the Administration Building, 55 E. Court Street, Doylestown PA by the Commissioners or their Representative at 11:30 A.M. on the day the bid is due.
7. The Commissioners of Bucks County reserve the right to reject any or all bids or parts thereof, as deemed to be in the best interest of the County.
8. If information is not included with your bid, and you receive a request from the County to provide it, you MUST deliver the information to the person making the request within 72 hours (excluding weekends). Any information not received within 72 hours may result in your bid being excluded from the evaluation and award process.

QUALIFICATIONS OF BIDDERS

9. The County's Purchasing Department and PennBid are the sole authorities to provide this bid package to interested companies or individuals. Bidders who are working from a bid package obtained from any other source may be working from an incomplete set of documents. The County assumes no responsibility for a bid's errors, omissions, or misinterpretations resulting from a Bidder's use of an incomplete bid package.
10. Bidders who have received the bid package from a source other than the County Purchasing Department or PennBid are not an official vendor of record for the bid. These bidders must download the document from PennBid to become a vendor of record. This will ensure that the bidder will receive all communication such as Addenda and Clarifications regarding the bid.
11. The County of Bucks may make such investigation, as it deems necessary to determine the ability of bidder to perform the work. The County reserves the right to reject any bid if investigation of such bidder fails to satisfy the County that such bidder is properly qualified to carry out the obligations of the Agreement, and to complete the work contemplated therein.
12. Bidders may be required to submit the names and addresses of the officers or principals of the Corporation, firm or partnership submitting a bid. Failure to comply could result in the rejection of such bid as non-responsive.

13. Unless required to complete the Questionnaire and Financial Statement as may be indicated elsewhere in these specifications, all bidders must be prepared to present suitable evidence of their financial standing, and to furnish a list of similar work recently completed.
14. The County has the right to reject any and all bids from any bidder that is in or contemplates bankruptcy of any chapter or nature. Said bidder must notify the County in writing of any existing condition or knowledge of same.

SECURITY DEPOSIT – REQUIREMENT

15. A security deposit (cash, a certified check or cashier's check-- drawn on a bank authorized to do business in the Commonwealth of Pennsylvania, or a properly executed bid bond-- if a corporation, **signed by a properly authorized representative of the providing company with the corporate seal**; if unincorporated, **signed by a properly authorized representative of the providing company with a witness signature** as well as a signature and seal by a properly authorized representative of the providing company with a witness signature as well as a signature and seal by a properly authorized officer of the bonding company with proof of the authority to sign on behalf of the bidder and the bonding company accompanying the bond) in the amount of 5% of the total bid. Said security must be made payable to the County of Bucks. Security deposit of cash or certified check must be deposited with the County Controller at least one-quarter hour before the time set for opening of bids. A Bid Bond security deposit must be uploaded with the bid response. The security deposit shall guarantee that the bidder will fully and faithfully comply with all of the terms of the bid, and give bond in accordance therewith.
16. Bid Bonds will be covered with surety of a company authorized to do business in the Commonwealth of Pennsylvania.
17. Bid Bonds provided as surety will not be returned to the bidder after award unless bidder specifically requests the County do so.
18. In the event the successful bidder (when security deposit is required) fails or refuses give surety as required within 20 days after the Bid has been awarded, bidder's security deposit may be declared forfeited as liquidated damages, the letter of acceptance of his bid may be voided, and all obligations of the Commissioners in connection herewith will be cancelled.
19. A security deposit in the required amount must be furnished. No bid will be considered unless the security deposit is furnished in the required amount.

FORM OF AGREEMENT

20. **Bidders shall execute the Agreement contained in the Invitation to Bid and upload it with their bid response.** It is expressly understood and agreed by the bidders that the contractual obligations of the County to the bidders are effective only after the execution of an Agreement signed by all parties AND the issuance of a purchase order by the Bucks County Purchasing Department for the goods and/or services requested. It is further expressly understood and agreed that the mere issuance of an Agreement between the County and a bidder will not oblige the County in any fashion unless and until a purchase order is received by the bidder.
21. Copies of any signatures and electronic signatures shall be considered original signatures.
22. Any changes to the Agreement contained in the Invitation to Bid are strictly prohibited and shall not be accepted.

DISCLOSURE OF CONTENTS

23. All proposals/bids and other material submitted becomes the property of the County and may be returned only at the County's option. Information contained in the proposals/bids will not be disclosed during the evaluation process. Under Pennsylvania's "Right to Know" laws public records are required to be open to reasonable inspection and reproduction. All proposal/bid information, including detailed price and cost information, will be held in confidence during the evaluation process and prior to the time a Notice of Intent to Award is issued. Thereafter all proposals/bids will become public information; subject to inspection and reproduction in accordance with the PA Right to Know Law (Act 3 of 2008), unless otherwise exempt under the Act.
24. Notwithstanding any terms or conditions contained herein, Consultant/Vendor agrees to comply with all Local, State and Federal laws and regulation. Consultant/Vendor specifically agrees to produce all documents that may be subject to public disclosure pursuant to the Pennsylvania Open Records Law.
25. Trade secrets and other proprietary data contained in a proposal may be held confidential if such data meets the definitions of confidential proprietary information and/or trade secrets under Section 102 of the Right to Know Law. Material considered confidential by the offeror must be clearly identified and the offeror must include a brief statement that sets out the reasons for the confidentiality and how this information meets the criteria of Section 102 of the law.

INTERPRETATION OF SPECIFICATION

26. Should a bidder discover discrepancies in the specifications, the matter shall be at once brought to the attention of the Bucks County Purchasing Department, and the discrepancies corrected before proceeding further.
27. All explanations, interpretations and instructions required under these specifications will be given by the Purchasing Director or designated Representative based on written requests from bidders submitted to the solicitation on the PennBid website. All questions must be submitted by noon seven calendar days prior to the due date; the questions will be answered by 5:00 pm five calendar days prior to the due date.

ADDENDUMS

28. Addendums will be posted to the solicitation on the PennBid website. Sending them in this way is an accommodation and the County of Bucks is not liable for any errors in transmission of the documents. Obtaining all bid documents including addendums is the responsibility of the bidder.

PROTECTION BY BIDDER

29. The bidder agrees to indemnify, defend and save harmless the Commissioners and their representatives from all suits or actions of every nature and description brought against them or any of them, on account of the use of patented or copyrighted appliances, materials, products or processes, and from all legal expenses and costs of suits regarding the same.
30. The bidder shall not assign, transfer, convey, sublet or otherwise dispose of the Agreement or any part thereof to anyone without the consent of the County of Bucks.

GENERAL CLAUSES

RESERVATIONS

31. The County of Bucks reserves the right to reject any or all bids and also reserves the right to waive any irregularities, informalities, deficiencies and/or defects in the bids received.
32. Any bidder who has demonstrated poor performance during either a current or previous agreement with the County of Bucks may be considered as an unqualified source and their bid may be rejected. The County of Bucks reserves the right to exercise this option as is deemed proper and/or necessary.

ACCESS TO ACCOUNTING RECORDS

33. The Contractor shall check all materials, equipment and labor entering into the Work and shall keep such full and detailed accounts as may be necessary for proper financial management under this Agreement and the system shall be satisfactory to the County. The County or its representative shall be afforded access to all the Contractor's records, books, correspondence, instructions, drawings, receipts vouchers, memoranda, and similar data relating to this Agreement, and the Contractor shall preserve all such records for a period of three years, or for such longer period as may be required by law, after the final payment.

ASSIGNMENT OF REFUND RIGHTS

34. The Contractor agrees to assign and transfer to the County all its rights to sales and use tax which may be refunded as a result of a claim for refund for materials purchased in connections with this Agreement. The Contractor further agrees that it will not file a claim for refund for any sales or use tax, which is the subject of this assignment.

AGREEMENTS WITH SUBCONTRACTORS

35. The Contractor agrees to include the "Access to Accounting Records" and "Assignments of Refund Rights" paragraphs, in full, in any Agreements with subcontractors.

DELIVERY

36. In general, deliveries shall be F.O.B. Destination and at such times as may be fixed by the Purchasing Director and shall not be made except upon definite instructions by the Purchasing Director.

PROVISIONS CONCERNING THE AMERICANS WITH DISABILITIES ACT

37. During the terms of this Agreement, the Contractor agrees as follows: Pursuant to federal regulations promulgated under the authority of The Americans with Disabilities Act, 28 C.F.R. Section 35.101 et seq., the Contractor understands and agrees that no individual with a disability shall, on the basis of disability, be excluded from participation in this Agreement or from activities provided for under this Agreement. As a condition of accepting and executing this Agreement, the

Contractor agrees to comply with the "General Prohibitions Against Discrimination," 28 C.F.R. Section 35.130, and all other regulations promulgated under Title II of the Americans with Disabilities Act which are applicable to the benefits, services, programs, and activities provided by the County of Bucks through Agreements with outside contractors.

38. The Contractor shall be responsible for and agrees to indemnify and hold harmless the County of Bucks from all losses, damages, expenses, claims, demands, suits and actions brought by any party against the County of Bucks as a result of the Contractor's failure to comply with the provisions of paragraph A. above.

SPECIAL CLAUSES

MANDATORY PRE-BID MEETING AND SITE VISIT

A **Mandatory** Pre-Bid Meeting and site visit will be held at 1:30 PM on June 22 at the site, 867 Newtown-Langhorne Rd, Langhorne PA. Closest intersection is Newtown-Langhorne Rd (Rt 413) and Heatons Mill Rd.

BONDS AND INSURANCE

All bidders are hereby informed that failure to provide the Bonds and Insurance Certificate with the required limits and coverage within 20 days of receiving a notice of the award may result in the bidder's security deposit being forfeited as liquidated damages and the bid being awarded to the next lowest bidder.

Where the Contract calls for the doing and performing of Public Work and labor necessary for the complete performance of the contract for the construction, reconstruction, alteration or repair of any Public building or other Public Work or Public improvement, including highway work, and where said contract exceeds $10,000 the successful bidder shall furnish to the Purchasing Director a:

PERFORMANCE BOND with surety in the amount of 100% of the contract amount. The Performance Bond shall be conditioned upon the faithful performance of the contract in accordance with the plans, specifications and conditions of the contract.

LABOR AND MATERIAL (PAYMENT) BOND with surety in the amount of 100% of the contract amount. The Labor and Material Bond shall be conditioned upon the prompt payment of all material furnished and/or labor supplied in the prosecution of the work.

Also required is a **MAINTENANCE BOND** with surety in the amount of 10% of the contract amount. The Maintenance Bond shall be surety against defective or inferior materials or workmanship which may develop during a period of one year from date of total completion and acceptance of all work performed under the contract.

INSURANCE REQUIREMENTS

All bidders are hereby informed that failure to provide the Insurance Certificate with the required limits and coverage within 20 days of receiving a notice of the award may result in the bid being awarded to the next lowest bidder.

Insurance Coverages and Limits are shown in the Standard Form of Agreement included in this bid package.

INFORMATION TECHNOLOGY POLICIES
Does Not Apply

EXCLUDED/DEBARRED PARTY CLAUSE FOR AGREEMENTS FOR THE NESHAMINY MANOR NURSING FACILITY
Does Not Apply

BACKGROUND CHECKS REQUIRED
Does Not Apply

CDC and PA DEPARTMENT OF HEATLH GUIDELINES
Bidders are given notice that the employees of the company awarded this contract is required to follow all CDC guidelines and all PA Department of Health guidelines regarding social distancing and the wearing of face masks while on County property.

PRISON RAPE ELIMINATION ACT
Does Not Apply

SPECIAL RESTRICTIONS FOR WORK IN THE CORRECTIONAL FACILITY
Does Not Apply

RULES AND REGULATIONS FOR OUTSIDE CONTRACTORS
It is the practice of Bucks County to require outside contractors to abide by established safety rules and regulations designed to protect our personnel and facilities. The intent of this procedure is to provide sufficient information to allow our contractors to conduct business in all County facilities in a safe and professional manner.

PROCEDURE

A. The General Services Department shall communicate the safety rules and regulations for outside contractors to the contractor or his representative prior to the beginning of work, and inform the contractor that violation of these rules and regulations by the contractor may be **grounds for cancellation of the Agreement** by the County Commissioners or the Chief Operating Officer.

B. All threats to safety involving outside contractors must be reported to the General Services Department.

C. Bucks County Purchasing Department or requesting department, shall send a copy of this procedure to all contractors as part of any bid or quote package issued.

D. The contractor must notify the General Services Department by phone at 215-345-3950 before starting work at any County facility.

RULES

A. The contractor is responsible for adherence to existing local, state and federal codes and regulations.

B. Personal vehicles may be parked in designated areas; all parking regulations as posted must be observed.

C. The possession of any type of weapon on county property is prohibited. The contractor shall not allow his employees to work under the influence of narcotics or intoxicating beverages.

D. Fighting, horse-play and running are prohibited within the entire facility.

E. Smoking is not permitted.

F. Before starting any excavation the contractor must consult with the General Services department for all known underground utilities. The contractor is also responsible to schedule a PA one Call before starting any work. All open pits and excavated areas must be properly protected at all times. Barricades, identification signs or other warning devices must be used at these hazardous locations when no work is being performed.

G. The treatment of injuries sustained by the contractor's employees shall be the responsibility of the contractor.

H. Regardless of the type of fuel used, all fuel-driven machines must be shut down for refueling.

I. Gasoline powered trucks must be equipped with a spark-arrester on tail pipe. No riders, other than the driver, are permitted on either empty or loaded trucks. Refueling must be done outside the building.

J. Adequate and proper eye protection such as safety glasses, face shields or goggles must be properly worn at all times when work offers an eye injury exposure. Safety glasses must also be worn in any posted area requiring their use.

K. Oily or otherwise dirty disposable wiping cloths must be deposited in closed covered containers.

L. Housekeeping is the contractor's responsibility. Clean-up of the respective working areas must be accomplished at the end of the day or shift or more often if an unusual hazard is created.

M. Bulk storage of flammable liquids must be kept outside of buildings. No more than one day's working supply should be inside the building at any time and they must be kept in properly labeled self-closing covered safety containers.

N. Dunnage, binding wire, metal strapping and other types of debris must be cleaned up immediately after use and taken to designated collection areas. At no time shall scrap be permitted to remain

in aisles and areas where it could become a "tripping" or a "slip and fall" hazard.

O. Aisles, exits, walkways and fire protection equipment must be maintained free from obstruction at all times. Fire doors must not be blocked or fastened open. Wires, cables or hoses, etc. shall not pass through a doorway and prevent the fire door from closing completely.

P. Adequate fire protection must be provided at every job site where flame and spark producing equipment is used. This equipment must be inspected by the contractor before it is used to ensure that it is in good working order. A Cutting and Welding Permit must be secured from the General Service Department before starting such work.

Q. General Services, in conjunction with the Fire Marshal's Office shall show the contractor the various methods of transmitting fire alarms within the facility. It is the responsibility of the contractor to familiarize his employees with these methods.

R. When welding and/or cutting are done in storage rooms, flammable liquid area and vapor degreaser areas, the flammable material must be adequately covered with flame retardant tarpaulins. While the cutting and/or welding is being done, at least one person must be stationed in the immediate area with a suitable fire extinguisher.

S. When cutting, welding or grinding work is to be done in the immediate vicinity of county employees, adequate screen protection from flying objects must be provided.

T. If and when it becomes necessary to use a fire extinguisher, it must be reported immediately to the General Services Department.

U. All ladders must be substantially built, free of defects and provided with the necessary safety equipment. Extension ladders, while in use, must be securely fastened to prevent them from falling or skidding. Aluminum ladders are not permitted.

V. Acetylene, oxygen, nitrogen and other compressed gas cylinders must be securely fastened in an upright position.

W. Contractors must store gas cylinders in a specified location. After completion of the work, the contractor is responsible for the removal of all his gas cylinders.

X. Any spillage, regardless of its nature, must be cleaned up immediately.

Y. Safety guards or other devices shall not be removed from tools or equipment except for repairs and must be replaced upon completion of repair.

Z. Scaffolds planks, ladders, ropes, ground wires, etc., shall be inspected by the contractor and replaced if they prove to be defective.

AA. Hard hats should be worn when overhead work is being performed.

BB. Temporary wiring must be properly insulated and substantially supported.

CC. If work necessitates the turning off of any portion of the sprinkler systems or power, General Services Department in conjunction with the Fire marshal's Office, must be notified 24 hours prior

to these systems being turned off or on.

DD. It is the responsibility of the contractor to see that only authorized, qualified (licensed if required) personnel use power actuated (stud) tools. Adequate shields to lessen the danger of flying materials must be erected if work is done in close proximity to county employees.

EE. It is the responsibility of the contractor's representative to familiarize himself with the building or work area layout and to instruct employees in the location of emergency exits and evacuation routes.

FF. The contractors employees will be permitted access only to those areas necessary for the performance of contractual work. Under no circumstances are the contractor's employees allowed to tour or roam around the facility or enter areas not necessary for the performance of their work.

GG. "Strike anywhere" matches are not permitted.

HH. All personnel must wear shirts with sleeves that cover the shoulders and pants that cover the entire leg to the ankle.

II. At no time is work permitted with materials that the employee does not understand or are not aware of the hazard. The contractor is required to have Material Safety Data Sheets for all materials.

SECTION 00 43 13 – CONSENT OF SURETY

CONSENT (OR AGREEMENT) OF SURETY

The undersigned (_____), a corporation organized and existing under
Name of Surety Co.

the laws of the State of _____ and authorized to do business in the Commonwealth of Pennsylvania, does hereby consent and agree with

County of Bucks

that if the proposal of (_____) for
Name of Bidder

Name of Bid: Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22

be accepted and a contract for said work be awarded to the said (_____),
Name of Bidder

it will, upon its being so awarded, become surety for the said (_____) on
Name of Bidder

such surety bonds as are called for in the Request for Bids.

Signed and Sealed (_____)
Date

Name of Surety Co.

By:_____
Attorney-in-fact

POWER OF ATTORNEY MUST BE ATTACHED TO CONSENT OF SURETY

Power of Attroney must be dated as of the same date as the Consent of Surety and the bond. You must provide below the name, address and phone number of a person to be contacted in the event any questions or claims arise regarding the bid and/or performance bond:

Name _____ Title _____

Address _____

Phone # _____

SECTION 00 43 14 – BID BOND

THE COUNTY OF BUCKS HAS PROVIDED THIS SAMPLE BID BOND FOR SUBMISSION TO A BIDDER'S INSURANCE/BONDING COMPANY. LANGUAGE SUBSTANTIALLY SIMILAR TO THIS WILL BE ACCEPTED; HOWEVER, LANGUAGE THAT LIMITS THE BID BOND TO THE "DIFFERENCE" BETWEEN BID AMOUNT AND SUCH LARGER AMOUNT FOR WHICH THE OWNER COULD CONTRACT, SHALL NOT BE ACCEPTABLE.

THIS BOND, made this ____ day of _____, 20__.

WITNESSETH:

KNOW ALL MEN BY THESE PRESENT, that we, the undersigned,
_____, as Principal and

_____ as
Surety, are held firmly bound unto the County of Bucks, as Owner, in the sum of 5% of the Amount of Bid, for the payment of which we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above is such that whereas the Principal has submitted to the County of Bucks a certain Bid, attached hereto and hereby made a part hereof to enter into a contract in writing for
_____.

NOW, THEREFORE,

(a) If said Bid be rejected, or in the alternate,

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Agreement attached hereto (properly completed in accordance with said Bid), and shall in all other respects perform the agreement created by the acceptance of said Bid,

Then this obligation shall be null and void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the 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 in no way be 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 in such of them as are corporations have caused their corporate seals to be hereto affixed and those present to be signed by their proper officers, the day and year first set forth above.

by Principal:_____ **by Surety:**_____

SECTION 00 45 13 - CONTRACTOR'S QUALIFICATION STATEMENT

THE UNDERSIGNED certifies under oath the truth and correctness of all statements and of all answers to questions made hereinafter.

SUBMITTED TO: County of Bucks

ADDRESS: 55 East Court Street
Doylestown, Pennsylvania

SUBMITTED BY: _____

ADDRESS: _____
_____
_____

PRINCIPAL'S NAME: _____

MAILING ADDRESS: _____
(if different than above) _____
_____

CHECK one: Corporation ( ), Partnership ( ), Individual ( ), Joint Venture ( ) or Other ( )

1.0A How long has your organization been in business as a Contractor? _____

1.0B Federal identification number (or SSN for Individual): _____

2.0 How many years has your organization been in business under its present business name? ___

2.1 Under what other or former names has your organization operated?

a. _____

b. _____

c. _____

3.0 If a Corporation, answer the following:

3.1 Date of incorporation: _____

3.2 State of incorporation: _____

3.3 President's name: _____

3.4 Vice Presidents names: _____

3.5 Secretary's name: _____

3.6 Treasurer's name: _____

4.0 If an Individual or a Partnership, answer the following:

4.1 Date of organization: _____

4.2 Type of Partnership: _____

4.3 Name and address of all partners (State whether General or Limited Partnership):

5.0 If other than a Corporation or Partnership, describe organization and name Principals:

6.0 List the States and the categories in which your organization is legally qualified to do business. Indicate registration or license numbers if applicable:

1. _____

7.0 Organization normally performs the following type of work:

1. List the categories of work that your organization normally performs with its own forces:
_____

8.0 Have you ever failed to complete any contract work that was awarded to you?
Yes ( ) or No ( )

If your answer was YES, fully describe the circumstances surrounding that failure.

9.0 Are you currently involved or during the past 10 years been involved with litigation with any current or previous customer either as plaintiff or defendant?
Yes ( ) or No ( )

If your answer was YES, state the nature and status of the litigation and the stated reasons for the dispute.

9.1 Have your firm or your subcontractors ever been debarred by Federal, State or local authorities:
Yes( ) or No ( )

If YES, provide a complete listing of events to that effect.

10.0 Within the last 10 years, has any Officer or Partner of your organization been an Officer or Partner of any other organization that defaulted on a contract?
Yes ( ) or No ( )

If YES, attach a separate sheet explaining the default.

11.0 How would you best describe your company?_____

How many employees are currently on your company payroll?

Full Time_____ Part Time_____

12.0 On a separate sheet of paper list all major contracts that your organization has in process, giving the Name of the Project, the Owner's Name, the Architect, the Contract Amount, Percent Complete and the Scheduled Completion Date.

13.0 On a separate sheet of paper list the major projects your organization has completed in the past five years, giving the Name of the Project, the Owner's Name, Architect's Name, the Date of Completion and the Contract Amount.

14.0 On a separate sheet of paper list the construction experience of the key individuals of your organization, including the project manager, site superintendent and foreman.

15.0 On a separate sheet of paper list the rolling stock and powered equipment that your organization owns or rents. Annotate the type and quantities of the equipment that you intend to use on this job site.

16.0 Trade References:

1. _____ 2. _____

_____ _____
_____ _____
_____ _____

3. _____ 4. _____

_____ _____
_____ _____
_____ _____

17.0 Bank References: 1. _____

_____
_____
_____

2. _____

_____
_____
_____

18.0 Name of Bonding Company with the name and address of agent:

Name: _____

A.M. Best Rating _____
Agent: _____
_____
_____
_____

18.1 Current bonding capacity available to Contractor $_____

19.0 For construction bids in excess of $100,000.00, attach last audited financial statement, including Contractor's latest balance sheet and income statement plus statement of cash flow showing the following:

a. Current Assets,
b. Net Fixed Assets,
c. Other Assets,
d. Current Liabilities,
e. Other Liabilities,
f. Name of firm preparing financial statement and date thereof.

19.1 Is this financial statement for the identical organization named on page one?
Yes ( ) or No ( )

If NO, explain the relationship and financial responsibility of the organization whose financial statement is provided.

Parent ( ), Subsidiary ( ), Other:_____

a. Will this organization act as a guarantor of the contract for construction?
Yes ( ) or No ( )

20.0 It will be required that the General Contractors retain craftsmen skilled and licensed to perform their work. The Owner will award contracts to responsible prospective bidders who have the ability and resources available to perform successfully under the terms and conditions of the proposed contract. The following are guidelines that the Owner may use in determining the lowest responsible bidder:

1. The General Contractor must have been in business for at least five years.
2. In consideration of the Owner's requirement for the provision of quality workmanship, safety prompt and timely completion of the work and the inflexibility of the work schedule it will be required that each Prime Contractor retain craftsmen skilled and licensed to perform their work.
3. The bidder has experience in the Construction of facilities of similar size, and can demonstrate their ability to complete a facility of this size and scope, within the contract guidelines and to the Owner's satisfaction.
4. The General Contractor will be responsible for the general construction work as outlined in all of the documents. The general contractor must be capable of performing 15% of the labor in their portion of the documents with their own forces. General construction "brokers" will not be qualified bidders.

Failure of the Bidder to submit this Contractor's Qualification Statement and required attachments may render the Bidder ineligible for award of the Contract. The Owner may reject any bidder or bid if the evidence submitted by or investigation of such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein.

21.0 Dated at_____this _____ day of _____, 20__

Name of Organization:_____

By: _____

Title: _____

22.0 M_____ Being duly sworn deposes and says that he/she is

the _____ of _____
and that the answers to the foregoing questions and all statements therein contained are true and correct.

Sworn to and Subscribed before me this ____ Day of _____, 20__.

_____
Notary Public My Commission expires:_____

SECTION 00 45 18 – HOLD HARMLESS CLAUSE

HOLD HARMLESS CLAUSE

A. The contractor shall indemnify, defend and save harmless the County of Bucks, their elected and appointed officers, consultants, agents and employees, including its individual members, from and against all losses, claims, demands, payments, suits, actions, recoveries, and judgments of every nature and description brought against or recoverable from the County of Bucks, their elected and appointed officers, consultants, agents and employees, including its individual members, by reason of any act or omission of the contractor, its agents, employees, assigns, and any entity acting in the contractor's behalf and on the contractor's direction in the execution of any work and any activities directly or indirectly incidental thereto. This specifically includes any negligence or carelessness of the contractor in failing to review all plans, specifications, and other documents published by the County of Bucks, their elected and appointed officers, consultants, agents and employees, including their individual members, in connection with the preparation and award of the contract. Such indemnity shall include reasonable attorney's fees and all costs and other expenses arising therefrom or incurred in connection therewith and shall not be limited by reason of the enumeration of any insurance coverage required therein.

B. The contractor shall assume all risk and bear any loss or injury to the property or any person which is caused by the negligence of the contractor, including his negligent failure to notify the County of Bucks, their elected and appointed officers, consultants, agents and employees, including their individual members, or any dangerous condition requiring the County of Bucks, their elected and appointed officers, consultants, agents and employees, including their individual members, action, during the period including periods when the contractor is not present on the site but during the progress of the work provided for in the contract until the same shall have been completed and accepted. The contractor shall also assume all responsibility for any and all loss by reason of the contractor's negligence or violation of any local, state, or federal law, regulation, practice, or order. The contractor shall give to the County of Bucks and all other appropriate authorities all required notices relating to the work for which the contract was let including all notices of any dangerous conditions.

C. The contractor, in executing this Agreement, represents to the County of Bucks, their elected and appointed officers, consultants, agents and employees, including their individual members, that the contents of this hold harmless clause has been communicated to any subcontractors or employees and that this representation is made in behalf of both him/herself and all persons or organizations acting in the contractors' behalf including any subcontractors.

ATTEST: _____ Name of Firm

_____ Witness

_____ Signature

_____ Please Print Name

SECTION 00 45 19 – INSTRUCTIONS FOR NON-COLLUSION AFFIDAVIT

INSTRUCTIONS

1. This Non-Collusion Affidavit is material to any contract awarded pursuant to this bid. According to the Pennsylvania Antibid-Rigging Act, 73 P.S. 1611 et seq., governmental agencies may require Non-Collusion Affidavits to be submitted together with bids.

2. This Non-Collusion Affidavit must be executed by the member, officer or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.

3. Bid rigging and other efforts to restrain competition, and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the Affidavit should examine it carefully before signing and assure himself or herself that each statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation, approval or submission of this bid.

4. In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an Affidavit must be submitted separately on behalf of each party.

5. The term "complementary bid" as used in the Affidavit has the meaning commonly associated with that term in the bidding process, and includes the knowing submission of bids lower than the bid of another firm, any intentionally low or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.

6. Failure to file an Affidavit in compliance with these instructions may result in disqualification of the bid.

(Intentionally left blank)

COUNTY OF BUCKS

NON-COLLUSION AFFIDAVIT

State of _____:
: s.s.
County of_____:

I state that I am_____ of _____
Title Name of Firm

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

1. The price(s) and amount of this bid have been arrived at independently and without consultation, communication or agreement with any other contractor, bidder or potential bidder.

2. Neither the price(s) nor amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

3. No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid lower than this bid, or to submit any intentionally low or noncompetitive bid or other form of complementary bid.

4. The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

5. _____, its affiliates, subsidiaries,
Name of my firm
officers, directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as follows:

I state that _____ understands and acknowledges
Name of my Firm

that the above representations are material and important, and will be relied on by County of Bucks in awarding the contract(s) for which this bid is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from County of Bucks of the true facts relating to the submission of bids for this contract.

_____
Name and Company Position

_____
Signature

Sworn to and Subscribed before me this ____ Day of _____, 20__.

_____
Notary Public

My Commission expires:_____

SECTION 00 45 43 - CORPORATE DISCLOSURE STATEMENT

Name of Business: _____

Principal Place of Business: _____

☐ PARTNERSHIP ☐ CORPORATION ☐ SOLE PROPRIETORSHIP

☐ I certify that the list below contains the names and home addresses of all stockholders holding 10% or more of the issued and outstanding stock of the undersigned. If one or more of the below is itself a corporation or partnership, I have annexed the names and addresses of anyone owning a 10% or greater interest therein.

☐ I certify that no one stockholder owns 10% or more of the issued and outstanding stock of the undersigned.

PLEASE CHECK APPROPRIATE BOXES ABOVE AND SIGN BELOW.

STOCKHOLDERS:

Name	Street Address	City and State
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

I further certify that no officer or employee of Bucks County has any interest, direct or indirect, in this corporation or partnership or in this contract.

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

Sworn to and Subscribed before me
this ____ Day of _____, 20__

_____
Signature of Bidder

_____
Signature of Notary Public

_____
Print or Type Name

Notary Public of _____

_____
Title of Person Signing

My Commission expires_____

SECTION 00 52 13 - Standard Form of Agreement Between Owner and Contractor

PART 1 - GENERAL

1.1 GENERAL

A. The Owner and Contractor shall execute a contract on the 2019 Edition of the AIA Document A132 “Standard Form of Agreement Between Owner and Contractor” as modified by this specifications.

B. A copy of the AIA Document A132 is enclosed and consists of the following pages.

C. The Agreement between Owner and Contractor shall be part of the Contract Documents.

AIA® Document A132™ – 2019

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

(Paragraphs deleted)

AGREEMENT made as of the date of award, ____ day of _____ in the year 20

BETWEEN the Owner:

County of Bucks
55 E. Court Street
Doylestown PA 18901

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

for the following Project:

Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County
General Construction Contract
Spec #39-07/22

The Construction Manager:

Pennoni Associates, Inc
1501 Main Street, Suite 220, Warrington PA 18976

The Architect/Engineer:

Kelly Maiello Associates, 1420 Walnut Street, 15th Floor, Philadelphia PA 19102
Voith & Mactavish Architects, 2401 Walnut Street, 6th Floor, Philadelphia PA 19103

This document has been prepared and significantly modified by the County of Bucks. Please read in its entirety.

The County and Contractor agree as follows.

Rev 1/2022

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

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

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Invitation to Bid, 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 Modifications, 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 the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the County.

The date of commencement will be fixed in a notice to proceed.

If, prior to the commencement of the Work, the County requires time to file mortgages, mechanics' liens and other security interests, the County's time requirement shall be as follows:

N/A

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

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:

N/A

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

Portion of Work	Substantial Completion Date

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

Not later than 365 calendar days from the date of commencement of the Work.

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

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ARTICLE 4 CONTRACT SUM

§ 4.1 The County shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be:

Stipulated Sum, in accordance with Section 4.2 below

§ 4.2 Stipulated Sum

The Contract Sum shall include:

§ 4.2.1 Base Bid: $_____

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, which are described in the Contract Documents and are hereby accepted by the County:

Item	Price
N/A	

§ 4.2.3 Allowances

§ 4.2.3.1 Allowances, if any, included in the Contract Sum:

Item	Price
N/A	

§ 4.2.4 Unit Prices

§ 4.2.4.1 Unit prices, if any:

Item	Units and Limitations	Price per Unit ($0.00)
N/A		

§ 4.3 <Reserved for Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price>

§ 4.4 <Reserved for Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price>

§ 4.5 Liquidated Damages

§ 4.5.1 Liquidated damages, if any:

It is mutually agreed that damages to the County for failure of the Contractor to fully complete the work under this Contract on or before the stipulated date/time within the Contract shall be **$750** for each calendar day after said date that shall elapse before the work is fully completed, which amount shall in no event be considered as a penalty, but as liquidated damages due the County because of said delay. The County may retain the amount thereof from any moneys which otherwise would be payable hereunder to the Contractor.

§ 4.6 The Total Stipulated Sum (Base Bid, Alternates and Allowance(s)) as identified above is:

Total Stipulated Sum:

_____

($ _____), subject to additions and deletions as provided in the Contract Documents

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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§ 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:

N/A

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the 20th day of a month, the County shall make payment of the amount certified to the Contractor not later than the last day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the County not later than 40 days after the Construction Manager receives the Application for Payment.

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 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 Construction Manager and Architect / Engineer may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

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

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 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 County, suitably stored off the site at a location agreed upon in writing; and
- **.3** That portion of Construction Change Directives that the Architect / Engineer determines, in the Architect's professional judgment, to be reasonably justified.

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

- **.1** The aggregate of any amounts previously paid by the County;
- **.2** The amount, if any, for Work that remains uncorrected and for which the Architect / Engineer has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;
- **.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 / Engineer may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and
- **.5** Retainage withheld pursuant to Section 5.1.4.4.

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

§ 5.1.4.4.1 Payment under this Contract shall be subject to a retainage of ten percent (**10%**) of the amount due the Contractor until fifty percent (**50%**) of the Work required by the Contract is completed at which time one half of the retainage will be returned to the Contractor if upon written request to the Architect, CM and Owner their approval is granted to this reduction in retainage. After fifty percent (**50%**) of the Work required by the Contract is completed, the retainage shall be reduced from ten percent (**10%**) to five percent (**5%**) of the value of completed work based on monthly progress payment requests.

§ 5.1.4.4.2 However, in the event a dispute arises between County and the Contractor, which dispute is based upon increased costs claimed by Other Contractors occasioned by delays or other actions of this Contractor, additional retainage in the sum of one and one half (1 ½) times the amount of any possible liability may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless the Contractor causing the additional claim furnishes a bond satisfactory to County to indemnify the County against the claim. However, all such monies retained by County may be withheld from the Contractor until Substantial Completion of the Contract.

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§ 5.1.4.4.3 Not Used.

§ 5.1.5 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

§ 5.1.6 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price>

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the County 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 A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 the Contractor has submitted a final accounting for the Cost of the Work, Determination of the Cost of the Work when payment is on the basis of the Cost of the Work, with or without a Guaranteed Maximum payment; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect / Engineer; such final payment shall be made by the County no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment.

§ 5.2.2 <Reserved for Final Payment Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect / Engineer will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

N/A

§ 6.2 Binding Resolution for Any Unresolved Claims

For any Claim subject to, but not resolved by the Initial Decision Maker, the only method of resolution shall be as follows:

Litigation shall be exclusively held in the Court of Common Pleas of Bucks County.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the County or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the County's convenience in accordance with Article 14 of AIA Document A232–2019, then the County shall pay the Contractor a termination fee as follows:

N/A

§ 7.1.2 The Work may be suspended by the County as provided in Article 14 of AIA Document A232–2019.

§ 7.2 <Reserved for Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price>

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

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§ 8.2 The County's representative:

Bernard Griggs, Project and Diversity Officer
County of Bucks
55 E Court Street
Doylestown PA 18901

§ 8.3 The Contractor's representative:

§ 8.4 Neither the County's nor the Contractor's representative shall be changed without 10 days' prior notice to the other party.

§ 8.5 Insurance and Bonds

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A232–2019.

100% Performance Bond
100% Labor and Materials Payment Bond
10% Maintenance Bond

The vendor awarded this contract is required to provide a Certificate of Insurance that contains a minimum of the following coverage and limits:

Commercial General Liability - (policy to include premises and operations, products/completed operations and blanket contractual liability- the contractual section of the coverage must cover this agreement and limit applies to a project specific basis)

General Aggregate Limit	$2,000,000.
Products & Completed Operations Aggregate Limit	$2,000,000.
Each Occurrence Limit	$1,000,000.

Automobile Liability - to include owned, non-owned and hired vehicles:

Combined Single Limit	$1,000,000.

Special Insurance Coverage: If any of the following exposures exist from the project/worksite, the appropriate coverage must be specifically identified on the Certificate of Insurance **and** a sub-limit if applicable.

"X, C, U" (Explosion, Collapse, Underground) Coverage

Each occurrence limit	$1,000,000.

Professional Liability, Errors and Omissions– ***usually used for professional services***

Each Jobsite limit	$1,000,000.
General Aggregate limit	$2,000,000.

Excess Liability - coverage is to be in an umbrella form, any restrictions or limitations in coverage should be specified on the certificate of insurance:

Each Occurrence	$2,000,000.
Aggregate Limit	$2,000,000.

Workers Compensation	Statutory
and Employer's Liability:	
Bodily Injury by Accident	$ 100,000. ea. accident
Bodily Injury by Disease	$ 100,000. ea. employee

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Bodily Injury by Disease $ 500,000. policy limit

Waiver of Subrogation in favor of the County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions applies under all policies.

When it applies, Additional Insured shall read: The County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions and [as applicable] the Construction Manager, Architect/Engineer and their employees, directors, and officers shall be included as additional insured on a primary and non-contributory basis with respect to the work performed for this contract: **Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22.**

Cancellation Clause shall read: Should any of the above-described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Certificate Holder - County of Bucks Board of Commissioners, Attn: Office of the Controller, 55 East Court St, Doylestown PA 18901.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, 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:

N/A

§ 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the County to cooperate with the Architect / Engineer and exercise the Contractor's skill and judgment in furthering the interests of the County; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the County's interests. The County agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

N/A

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents and those documents referenced therein:

.1 AIA Document A132™–2019, Standard Form of Agreement Between County and Contractor, Construction Manager as Adviser Edition

.2 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.3 Drawings

Number	Title	Date
See Invitation to Bid		

.4 Specifications

Section	Title	Date	Pages
See Invitation to Bid			

.5 Addenda, if any:

Number	Date	Pages

Init.

/

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User Notes: (1261664080)

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 Additional documents, if any, forming part of the Contract Documents are listed below:

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

COUNTY OF BUCKS **BOARD OF COMMISSIONERS**	**CONTRACTOR**
Robert J. Harvie Jr., *Chair*	*(Signature)*
Diane M. Ellis-Marseglia, *LCSW, Vice Chair*	*(Printed name)*
Gene DiGirolamo, *Secretary*	*(Printed title)*
Gail Humphrey, Chief Clerk *Date*	

(Paragraphs deleted)

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User Notes: (1261664080)

AIA® Document A132™ – 2019

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

(Paragraphs deleted)
AGREEMENT made as of the date of award, ____ day of _____ in the year 20

BETWEEN the Owner:

County of Bucks
55 E. Court Street
Doylestown PA 18901

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

for the following Project:

Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County
Mechanical Contract
Spec #39-07/22

The Construction Manager:

Pennoni Associates, Inc
1501 Main Street, Suite 220, Warrington PA 18976

The Architect/Engineer:

Kelly Maiello Associates, 1420 Walnut Street, 15th Floor, Philadelphia PA 19102
Voith & Mactavish Architects, 2401 Walnut Street, 6th Floor, Philadelphia PA 19103

This document has been prepared and significantly modified by the County of Bucks. Please read in its entirety.

The County and Contractor agree as follows.

Rev 1/2022

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

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This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

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6 DISPUTE RESOLUTION

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User Notes: (1282755385)

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Invitation to Bid, 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 Modifications, 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 the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the County.

The date of commencement will be fixed in a notice to proceed.

If, prior to the commencement of the Work, the County requires time to file mortgages, mechanics' liens and other security interests, the County's time requirement shall be as follows:

N/A

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

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:

N/A

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

Portion of Work	Substantial Completion Date

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

Not later than 365 calendar days from the date of commencement of the Work.

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

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ARTICLE 4 CONTRACT SUM

§ 4.1 The County shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be:

Stipulated Sum, in accordance with Section 4.2 below

§ 4.2 Stipulated Sum

The Contract Sum shall include:

§ 4.2.1 Base Bid: $_____

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, which are described in the Contract Documents and are hereby accepted by the County:

Item	Price
N/A	

§ 4.2.3 Allowances

§ 4.2.3.1 Allowances, if any, included in the Contract Sum:

Item	Price
N/A	

§ 4.2.4 Unit Prices

§ 4.2.4.1 Unit prices, if any:

Item	Units and Limitations	Price per Unit ($0.00)
N/A		

§ 4.3 <Reserved for Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price>

§ 4.4 <Reserved for Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price>

§ 4.5 Liquidated Damages

§ 4.5.1 Liquidated damages, if any:

It is mutually agreed that damages to the County for failure of the Contractor to fully complete the work under this Contract on or before the stipulated date/time within the Contract shall be **$750** for each calendar day after said date that shall elapse before the work is fully completed, which amount shall in no event be considered as a penalty, but as liquidated damages due the County because of said delay. The County may retain the amount thereof from any moneys which otherwise would be payable hereunder to the Contractor.

§ 4.6 The Total Stipulated Sum (Base Bid, Alternates and Allowance(s)) as identified above is:

Total Stipulated Sum:

_____

($ _____), subject to additions and deletions as provided in the Contract Documents

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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§ 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:

N/A

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the 20th day of a month, the County shall make payment of the amount certified to the Contractor not later than the last day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the County not later than 40 days after the Construction Manager receives the Application for Payment.

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 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 Construction Manager and Architect / Engineer may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

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

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 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 County, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect / Engineer determines, in the Architect's professional judgment, to be reasonably justified.

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

.1 The aggregate of any amounts previously paid by the County;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect / Engineer has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.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 / Engineer may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and

.5 Retainage withheld pursuant to Section 5.1.4.4.

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

§ 5.1.4.4.1 Payment under this Contract shall be subject to a retainage of ten percent (**10%**) of the amount due the Contractor until fifty percent (**50%**) of the Work required by the Contract is completed at which time one half of the retainage will be returned to the Contractor if upon written request to the Architect, CM and Owner their approval is granted to this reduction in retainage. After fifty percent (**50%**) of the Work required by the Contract is completed, the retainage shall be reduced from ten percent (**10%**) to five percent (**5%**) of the value of completed work based on monthly progress payment requests.

§ 5.1.4.4.2 However, in the event a dispute arises between County and the Contractor, which dispute is based upon increased costs claimed by Other Contractors occasioned by delays or other actions of this Contractor, additional retainage in the sum of one and one half (1 ½) times the amount of any possible liability may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless the Contractor causing the additional claim furnishes a bond satisfactory to County to indemnify the County against the claim. However, all such monies retained by County may be withheld from the Contractor until Substantial Completion of the Contract.

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§ 5.1.4.4.3 Not Used.

§ 5.1.5 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

§ 5.1.6 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price>

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the County 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 A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 the Contractor has submitted a final accounting for the Cost of the Work, Determination of the Cost of the Work when payment is on the basis of the Cost of the Work, with or without a Guaranteed Maximum payment; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect / Engineer; such final payment shall be made by the County no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment.

§ 5.2.2 <Reserved for Final Payment Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect / Engineer will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

N/A

§ 6.2 Binding Resolution for Any Unresolved Claims

For any Claim subject to, but not resolved by the Initial Decision Maker, the only method of resolution shall be as follows:

Litigation shall be exclusively held in the Court of Common Pleas of Bucks County.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the County or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the County's convenience in accordance with Article 14 of AIA Document A232–2019, then the County shall pay the Contractor a termination fee as follows:

N/A

§ 7.1.2 The Work may be suspended by the County as provided in Article 14 of AIA Document A232–2019.

§ 7.2 <Reserved for Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price>

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

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User Notes: (1282755385)

§ 8.2 The County's representative:

Bernard Griggs, Project and Diversity Officer
County of Bucks
55 E Court Street
Doylestown PA 18901

§ 8.3 The Contractor's representative:

§ 8.4 Neither the County's nor the Contractor's representative shall be changed without 10 days' prior notice to the other party.

§ 8.5 Insurance and Bonds

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A232–2019.

100% Performance Bond
100% Labor and Materials Payment Bond
10% Maintenance Bond

The vendor awarded this contract is required to provide a Certificate of Insurance that contains a minimum of the following coverage and limits:

Commercial General Liability - (policy to include premises and operations, products/completed operations and blanket contractual liability- the contractual section of the coverage must cover this agreement and limit applies to a project specific basis)

General Aggregate Limit	$2,000,000.
Products & Completed Operations Aggregate Limit	$2,000,000.
Each Occurrence Limit	$1,000,000.

Automobile Liability - to include owned, non-owned and hired vehicles:

Combined Single Limit	$1,000,000.

Special Insurance Coverage: If any of the following exposures exist from the project/worksite, the appropriate coverage must be specifically identified on the Certificate of Insurance **and** a sub-limit if applicable.

"X, C, U" (Explosion, Collapse, Underground) Coverage

Each occurrence limit	$1,000,000.

Professional Liability, Errors and Omissions– ***usually used for professional services***

Each Jobsite limit	$1,000,000.
General Aggregate limit	$2,000,000.

Excess Liability - coverage is to be in an umbrella form, any restrictions or limitations in coverage should be specified on the certificate of insurance:

Each Occurrence	$2,000,000.
Aggregate Limit	$2,000,000.

Workers Compensation and Employer's Liability:	Statutory
Bodily Injury by Accident	$ 100,000. ea. accident
Bodily Injury by Disease	$ 100,000. ea. employee

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Bodily Injury by Disease $ 500,000. policy limit

Waiver of Subrogation in favor of the County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions applies under all policies.

When it applies, Additional Insured shall read: The County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions and [as applicable] the Construction Manager, Architect/Engineer and their employees, directors, and officers shall be included as additional insured on a primary and non-contributory basis with respect to the work performed for this contract: **Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22.**

Cancellation Clause shall read: Should any of the above-described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Certificate Holder - County of Bucks Board of Commissioners, Attn: Office of the Controller, 55 East Court St, Doylestown PA 18901.

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§ 8.8 Other provisions:

N/A

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See Invitation to Bid		

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Section	Title	Date	Pages
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.6 Additional documents, if any, forming part of the Contract Documents are listed below:

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

COUNTY OF BUCKS **BOARD OF COMMISSIONERS**	**CONTRACTOR**
Robert J. Harvie Jr., *Chair*	*(Signature)*
Diane M. Ellis-Marseglia, *LCSW, Vice Chair*	*(Printed name)*
Gene DiGirolamo, *Secretary*	*(Printed title)*
Gail Humphrey, Chief Clerk *Date*	

(Paragraphs deleted)

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User Notes: (1282755385)

AIA® Document A132™ – 2019

Standard Form of Agreement Between Owner and Contractor, *Construction Manager as Adviser Edition*

(Paragraphs deleted)
AGREEMENT made as of the date of award, ____ day of _____ in the year 20

BETWEEN the Owner:

County of Bucks
55 E. Court Street
Doylestown PA 18901

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

for the following Project:

Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County
Electrical Contract
Spec #39-07/22

The Construction Manager:

Pennoni Associates, Inc
1501 Main Street, Suite 220, Warrington PA 18976

The Architect/Engineer:

Kelly Maiello Associates, 1420 Walnut Street, 15th Floor, Philadelphia PA 19102
Voith & Mactavish Architects, 2401 Walnut Street, 6th Floor, Philadelphia PA 19103

This document has been prepared and significantly modified by the County of Bucks. Please read in its entirety.

The County and Contractor agree as follows.

Rev 1/2022

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

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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Invitation to Bid, 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 Modifications, 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 the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the County.

The date of commencement will be fixed in a notice to proceed.

If, prior to the commencement of the Work, the County requires time to file mortgages, mechanics' liens and other security interests, the County's time requirement shall be as follows:

N/A

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

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:

N/A

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

Portion of Work	Substantial Completion Date

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

Not later than 365 calendar days from the date of commencement of the Work.

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

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ARTICLE 4 CONTRACT SUM

§ 4.1 The County shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be:

Stipulated Sum, in accordance with Section 4.2 below

§ 4.2 Stipulated Sum

The Contract Sum shall include:

§ 4.2.1 Base Bid: $_____

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, which are described in the Contract Documents and are hereby accepted by the County:

Item	Price
N/A	

§ 4.2.3 Allowances

§ 4.2.3.1 Allowances, if any, included in the Contract Sum:

Item	Price
N/A	

§ 4.2.4 Unit Prices

§ 4.2.4.1 Unit prices, if any:

Item	Units and Limitations	Price per Unit ($0.00)
N/A		

§ 4.3 <Reserved for Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price>

§ 4.4 <Reserved for Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price>

§ 4.5 Liquidated Damages

§ 4.5.1 Liquidated damages, if any:

It is mutually agreed that damages to the County for failure of the Contractor to fully complete the work under this Contract on or before the stipulated date/time within the Contract shall be **$750** for each calendar day after said date that shall elapse before the work is fully completed, which amount shall in no event be considered as a penalty, but as liquidated damages due the County because of said delay. The County may retain the amount thereof from any moneys which otherwise would be payable hereunder to the Contractor.

§ 4.6 The Total Stipulated Sum (Base Bid, Alternates and Allowance(s)) as identified above is:

Total Stipulated Sum:

_____

($ _____), subject to additions and deletions as provided in the Contract Documents

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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§ 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:

N/A

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the 20th day of a month, the County shall make payment of the amount certified to the Contractor not later than the last day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the County not later than 40 days after the Construction Manager receives the Application for Payment.

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 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 Construction Manager and Architect / Engineer may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

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

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 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 County, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect / Engineer determines, in the Architect's professional judgment, to be reasonably justified.

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

.1 The aggregate of any amounts previously paid by the County;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect / Engineer has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.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 / Engineer may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and

.5 Retainage withheld pursuant to Section 5.1.4.4.

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

§ 5.1.4.4.1 Payment under this Contract shall be subject to a retainage of ten percent (**10%**) of the amount due the Contractor until fifty percent (**50%**) of the Work required by the Contract is completed at which time one half of the retainage will be returned to the Contractor if upon written request to the Architect, CM and Owner their approval is granted to this reduction in retainage. After fifty percent (**50%**) of the Work required by the Contract is completed, the retainage shall be reduced from ten percent (**10%**) to five percent (**5%**) of the value of completed work based on monthly progress payment requests.

§ 5.1.4.4.2 However, in the event a dispute arises between County and the Contractor, which dispute is based upon increased costs claimed by Other Contractors occasioned by delays or other actions of this Contractor, additional retainage in the sum of one and one half (1 ½) times the amount of any possible liability may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless the Contractor causing the additional claim furnishes a bond satisfactory to County to indemnify the County against the claim. However, all such monies retained by County may be withheld from the Contractor until Substantial Completion of the Contract.

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§ 5.1.4.4.3 Not Used.

§ 5.1.5 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

§ 5.1.6 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price>

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the County 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 A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 the Contractor has submitted a final accounting for the Cost of the Work, Determination of the Cost of the Work when payment is on the basis of the Cost of the Work, with or without a Guaranteed Maximum payment; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect / Engineer; such final payment shall be made by the County no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment.

§ 5.2.2 <Reserved for Final Payment Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect / Engineer will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

N/A

§ 6.2 Binding Resolution for Any Unresolved Claims

For any Claim subject to, but not resolved by the Initial Decision Maker, the only method of resolution shall be as follows:

Litigation shall be exclusively held in the Court of Common Pleas of Bucks County.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the County or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the County's convenience in accordance with Article 14 of AIA Document A232–2019, then the County shall pay the Contractor a termination fee as follows:

N/A

§ 7.1.2 The Work may be suspended by the County as provided in Article 14 of AIA Document A232–2019.

§ 7.2 <Reserved for Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price>

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

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§ 8.2 The County's representative:

Bernard Griggs, Project and Diversity Officer
County of Bucks
55 E Court Street
Doylestown PA 18901

§ 8.3 The Contractor's representative:

§ 8.4 Neither the County's nor the Contractor's representative shall be changed without 10 days' prior notice to the other party.

§ 8.5 Insurance and Bonds

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A232–2019.

100% Performance Bond
100% Labor and Materials Payment Bond
10% Maintenance Bond

The vendor awarded this contract is required to provide a Certificate of Insurance that contains a minimum of the following coverage and limits:

Commercial General Liability - (policy to include premises and operations, products/completed operations and blanket contractual liability- the contractual section of the coverage must cover this agreement and limit applies to a project specific basis)

General Aggregate Limit	$2,000,000.
Products & Completed Operations Aggregate Limit	$2,000,000.
Each Occurrence Limit	$1,000,000.

Automobile Liability - to include owned, non-owned and hired vehicles:

Combined Single Limit	$1,000,000.

Special Insurance Coverage: If any of the following exposures exist from the project/worksite, the appropriate coverage must be specifically identified on the Certificate of Insurance **and** a sub-limit if applicable.

"X, C, U" (Explosion, Collapse, Underground) Coverage

Each occurrence limit	$1,000,000.

Professional Liability, Errors and Omissions– ***usually used for professional services***

Each Jobsite limit	$1,000,000.
General Aggregate limit	$2,000,000.

Excess Liability - coverage is to be in an umbrella form, any restrictions or limitations in coverage should be specified on the certificate of insurance:

Each Occurrence	$2,000,000.
Aggregate Limit	$2,000,000.

Workers Compensation	Statutory
and Employer's Liability:	
Bodily Injury by Accident	$ 100,000. ea. accident
Bodily Injury by Disease	$ 100,000. ea. employee

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Bodily Injury by Disease $ 500,000. policy limit

Waiver of Subrogation in favor of the County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions applies under all policies.

When it applies, Additional Insured shall read: The County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions and [as applicable] the Construction Manager, Architect/Engineer and their employees, directors, and officers shall be included as additional insured on a primary and non-contributory basis with respect to the work performed for this contract: **Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22.**

Cancellation Clause shall read: Should any of the above-described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Certificate Holder - County of Bucks Board of Commissioners, Attn: Office of the Controller, 55 East Court St, Doylestown PA 18901.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, 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:

N/A

§ 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the County to cooperate with the Architect / Engineer and exercise the Contractor's skill and judgment in furthering the interests of the County; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the County's interests. The County agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

N/A

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents and those documents referenced therein:

.1 AIA Document A132™–2019, Standard Form of Agreement Between County and Contractor, Construction Manager as Adviser Edition

.2 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.3 Drawings

Number	Title	Date
See Invitation to Bid		

.4 Specifications

Section	Title	Date	Pages
See Invitation to Bid			

.5 Addenda, if any:

Number	Date	Pages

Init.

/

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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 Additional documents, if any, forming part of the Contract Documents are listed below:

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

COUNTY OF BUCKS **BOARD OF COMMISSIONERS**	**CONTRACTOR**
Robert J. Harvie Jr., *Chair*	*(Signature)*
Diane M. Ellis-Marseglia, *LCSW, Vice Chair*	*(Printed name)*
Gene DiGirolamo, *Secretary*	*(Printed title)*
Gail Humphrey, Chief Clerk *Date*	

(Paragraphs deleted)

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AIA® Document A132™ – 2019

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

(Paragraphs deleted)
AGREEMENT made as of the date of award, ____ day of _____ in the year 20

BETWEEN the Owner:

County of Bucks
55 E. Court Street
Doylestown PA 18901

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

for the following Project:

Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County
Plumbing & Fire Protection Contract
Spec #39-07/22

The Construction Manager:

Pennoni Associates, Inc
1501 Main Street, Suite 220, Warrington PA 18976

The Architect/Engineer:

Kelly Maiello Associates, 1420 Walnut Street, 15th Floor, Philadelphia PA 19102
Voith & Mactavish Architects, 2401 Walnut Street, 6th Floor, Philadelphia PA 19103

This document has been prepared and significantly modified by the County of Bucks. Please read in its entirety.

The County and Contractor agree as follows.

Rev 1/2022

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

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

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Invitation to Bid, 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 Modifications, 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 the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the County.

The date of commencement will be fixed in a notice to proceed.

If, prior to the commencement of the Work, the County requires time to file mortgages, mechanics' liens and other security interests, the County's time requirement shall be as follows:

N/A

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

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:

N/A

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

Portion of Work	Substantial Completion Date

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

Not later than 365 calendar days from the date of commencement of the Work.

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

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User Notes: (1883989074)

ARTICLE 4 CONTRACT SUM

§ 4.1 The County shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be:

Stipulated Sum, in accordance with Section 4.2 below

§ 4.2 Stipulated Sum

The Contract Sum shall include:

§ 4.2.1 Base Bid: $_____

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, which are described in the Contract Documents and are hereby accepted by the County:

Item	Price
N/A	

§ 4.2.3 Allowances

§ 4.2.3.1 Allowances, if any, included in the Contract Sum:

Item	Price
N/A	

§ 4.2.4 Unit Prices

§ 4.2.4.1 Unit prices, if any:

Item	Units and Limitations	Price per Unit ($0.00)
N/A		

§ 4.3 <Reserved for Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price>

§ 4.4 <Reserved for Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price>

§ 4.5 Liquidated Damages

§ 4.5.1 Liquidated damages, if any:

It is mutually agreed that damages to the County for failure of the Contractor to fully complete the work under this Contract on or before the stipulated date/time within the Contract shall be **$750** for each calendar day after said date that shall elapse before the work is fully completed, which amount shall in no event be considered as a penalty, but as liquidated damages due the County because of said delay. The County may retain the amount thereof from any moneys which otherwise would be payable hereunder to the Contractor.

§ 4.6 The Total Stipulated Sum (Base Bid, Alternates and Allowance(s)) as identified above is:

Total Stipulated Sum:

_____

($ _____), subject to additions and deletions as provided in the Contract Documents

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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§ 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:

N/A

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the 20th day of a month, the County shall make payment of the amount certified to the Contractor not later than the last day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the County not later than 40 days after the Construction Manager receives the Application for Payment.

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 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 Construction Manager and Architect / Engineer may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

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

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 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 County, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect / Engineer determines, in the Architect's professional judgment, to be reasonably justified.

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

.1 The aggregate of any amounts previously paid by the County;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect / Engineer has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.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 / Engineer may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and

.5 Retainage withheld pursuant to Section 5.1.4.4.

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

§ 5.1.4.4.1 Payment under this Contract shall be subject to a retainage of ten percent (**10%**) of the amount due the Contractor until fifty percent (**50%**) of the Work required by the Contract is completed at which time one half of the retainage will be returned to the Contractor if upon written request to the Architect, CM and Owner their approval is granted to this reduction in retainage. After fifty percent (**50%**) of the Work required by the Contract is completed, the retainage shall be reduced from ten percent (**10%**) to five percent (**5%**) of the value of completed work based on monthly progress payment requests.

§ 5.1.4.4.2 However, in the event a dispute arises between County and the Contractor, which dispute is based upon increased costs claimed by Other Contractors occasioned by delays or other actions of this Contractor, additional retainage in the sum of one and one half (1 ½) times the amount of any possible liability may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless the Contractor causing the additional claim furnishes a bond satisfactory to County to indemnify the County against the claim. However, all such monies retained by County may be withheld from the Contractor until Substantial Completion of the Contract.

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§ 5.1.4.4.3 Not Used.

§ 5.1.5 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

§ 5.1.6 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price>

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the County 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 A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 the Contractor has submitted a final accounting for the Cost of the Work, Determination of the Cost of the Work when payment is on the basis of the Cost of the Work, with or without a Guaranteed Maximum payment; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect / Engineer; such final payment shall be made by the County no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment.

§ 5.2.2 <Reserved for Final Payment Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect / Engineer will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

N/A

§ 6.2 Binding Resolution for Any Unresolved Claims

For any Claim subject to, but not resolved by the Initial Decision Maker, the only method of resolution shall be as follows:

Litigation shall be exclusively held in the Court of Common Pleas of Bucks County.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the County or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the County's convenience in accordance with Article 14 of AIA Document A232–2019, then the County shall pay the Contractor a termination fee as follows:

N/A

§ 7.1.2 The Work may be suspended by the County as provided in Article 14 of AIA Document A232–2019.

§ 7.2 <Reserved for Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price>

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

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§ 8.2 The County's representative:

Bernard Griggs, Project and Diversity Officer
County of Bucks
55 E Court Street
Doylestown PA 18901

§ 8.3 The Contractor's representative:

§ 8.4 Neither the County's nor the Contractor's representative shall be changed without 10 days' prior notice to the other party.

§ 8.5 Insurance and Bonds

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A232–2019.

100% Performance Bond
100% Labor and Materials Payment Bond
10% Maintenance Bond

The vendor awarded this contract is required to provide a Certificate of Insurance that contains a minimum of the following coverage and limits:

Commercial General Liability - (policy to include premises and operations, products/completed operations and blanket contractual liability- the contractual section of the coverage must cover this agreement and limit applies to a project specific basis)

General Aggregate Limit	$2,000,000.
Products & Completed Operations Aggregate Limit	$2,000,000.
Each Occurrence Limit	$1,000,000.

Automobile Liability - to include owned, non-owned and hired vehicles:

Combined Single Limit	$1,000,000.

Special Insurance Coverage: If any of the following exposures exist from the project/worksite, the appropriate coverage must be specifically identified on the Certificate of Insurance **and** a sub-limit if applicable.

"X, C, U" (Explosion, Collapse, Underground) Coverage

Each occurrence limit	$1,000,000.

Professional Liability, Errors and Omissions– ***usually used for professional services***

Each Jobsite limit	$1,000,000.
General Aggregate limit	$2,000,000.

Excess Liability - coverage is to be in an umbrella form, any restrictions or limitations in coverage should be specified on the certificate of insurance:

Each Occurrence	$2,000,000.
Aggregate Limit	$2,000,000.

Workers Compensation	Statutory
and Employer's Liability:	
Bodily Injury by Accident	$ 100,000. ea. accident
Bodily Injury by Disease	$ 100,000. ea. employee

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Bodily Injury by Disease $ 500,000. policy limit

Waiver of Subrogation in favor of the County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions applies under all policies.

When it applies, Additional Insured shall read: The County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions and [as applicable] the Construction Manager, Architect/Engineer and their employees, directors, and officers shall be included as additional insured on a primary and non-contributory basis with respect to the work performed for this contract: **Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22.**

Cancellation Clause shall read: Should any of the above-described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Certificate Holder - County of Bucks Board of Commissioners, Attn: Office of the Controller, 55 East Court St, Doylestown PA 18901.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, 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:

N/A

§ 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the County to cooperate with the Architect / Engineer and exercise the Contractor's skill and judgment in furthering the interests of the County; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the County's interests. The County agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

N/A

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents and those documents referenced therein:

.1 AIA Document A132™–2019, Standard Form of Agreement Between County and Contractor, Construction Manager as Adviser Edition

.2 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.3 Drawings

Number	Title	Date
See Invitation to Bid		

.4 Specifications

Section	Title	Date	Pages
See Invitation to Bid			

.5 Addenda, if any:

Number	Date	Pages

Init.

/

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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 Additional documents, if any, forming part of the Contract Documents are listed below:

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

COUNTY OF BUCKS **BOARD OF COMMISSIONERS**	**CONTRACTOR**
Robert J. Harvie Jr., *Chair*	*(Signature)*
Diane M. Ellis-Marseglia, *LCSW, Vice Chair*	*(Printed name)*
Gene DiGirolamo, *Secretary*	*(Printed title)*
Gail Humphrey, Chief Clerk *Date*	

(Paragraphs deleted)

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AIA® Document A132™ – 2019

Standard Form of Agreement Between Owner and Contractor, *Construction Manager as Adviser Edition*

(Paragraphs deleted)
AGREEMENT made as of the date of award, ____ day of _____ in the year 20

BETWEEN the Owner:

County of Bucks
55 E. Court Street
Doylestown PA 18901

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

for the following Project:

Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County
Elevator Contract
Spec #39-07/22

The Construction Manager:

Pennoni Associates, Inc
1501 Main Street, Suite 220, Warrington PA 18976

The Architect/Engineer:

Kelly Maiello Associates, 1420 Walnut Street, 15th Floor, Philadelphia PA 19102
Voith & Mactavish Architects, 2401 Walnut Street, 6th Floor, Philadelphia PA 19103

This document has been prepared and significantly modified by the County of Bucks. Please read in its entirety.

The County and Contractor agree as follows.

Rev 1/2022

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

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

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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TABLE OF ARTICLES

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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Invitation to Bid, 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 Modifications, 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 the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the County.

The date of commencement will be fixed in a notice to proceed.

If, prior to the commencement of the Work, the County requires time to file mortgages, mechanics' liens and other security interests, the County's time requirement shall be as follows:

N/A

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

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:

N/A

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

Portion of Work	Substantial Completion Date

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:

Not later than 365 calendar days from the date of commencement of the Work.

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

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ARTICLE 4 CONTRACT SUM

§ 4.1 The County shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be:

Stipulated Sum, in accordance with Section 4.2 below

§ 4.2 Stipulated Sum

The Contract Sum shall include:

§ 4.2.1 Base Bid: $_____

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, which are described in the Contract Documents and are hereby accepted by the County:

Item	Price
N/A	

§ 4.2.3 Allowances

§ 4.2.3.1 Allowances, if any, included in the Contract Sum:

Item	Price
N/A	

§ 4.2.4 Unit Prices

§ 4.2.4.1 Unit prices, if any:

Item	Units and Limitations	Price per Unit ($0.00)
N/A		

§ 4.3 <Reserved for Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price>

§ 4.4 <Reserved for Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price>

§ 4.5 Liquidated Damages

§ 4.5.1 Liquidated damages, if any:

It is mutually agreed that damages to the County for failure of the Contractor to fully complete the work under this Contract on or before the stipulated date/time within the Contract shall be **$750** for each calendar day after said date that shall elapse before the work is fully completed, which amount shall in no event be considered as a penalty, but as liquidated damages due the County because of said delay. The County may retain the amount thereof from any moneys which otherwise would be payable hereunder to the Contractor.

§ 4.6 The Total Stipulated Sum (Base Bid, Alternates and Allowance(s)) as identified above is:

Total Stipulated Sum:

_____

($ _____), subject to additions and deletions as provided in the Contract Documents

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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§ 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:

N/A

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the 20th day of a month, the County shall make payment of the amount certified to the Contractor not later than the last day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the County not later than 40 days after the Construction Manager receives the Application for Payment.

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

§ 5.1.4.1 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 Construction Manager and Architect / Engineer may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

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

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 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 County, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect / Engineer determines, in the Architect's professional judgment, to be reasonably justified.

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

.1 The aggregate of any amounts previously paid by the County;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect / Engineer has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.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 / Engineer may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and

.5 Retainage withheld pursuant to Section 5.1.4.4.

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

§ 5.1.4.4.1 Payment under this Contract shall be subject to a retainage of ten percent (**10%**) of the amount due the Contractor until fifty percent (**50%**) of the Work required by the Contract is completed at which time one half of the retainage will be returned to the Contractor if upon written request to the Architect, CM and Owner their approval is granted to this reduction in retainage. After fifty percent (**50%**) of the Work required by the Contract is completed, the retainage shall be reduced from ten percent (**10%**) to five percent (**5%**) of the value of completed work based on monthly progress payment requests.

§ 5.1.4.4.2 However, in the event a dispute arises between County and the Contractor, which dispute is based upon increased costs claimed by Other Contractors occasioned by delays or other actions of this Contractor, additional retainage in the sum of one and one half (1 ½) times the amount of any possible liability may be withheld until such time as a final resolution is agreed to by all parties directly or indirectly involved, unless the Contractor causing the additional claim furnishes a bond satisfactory to County to indemnify the County against the claim. However, all such monies retained by County may be withheld from the Contractor until Substantial Completion of the Contract.

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§ 5.1.4.4.3 Not Used.

§ 5.1.5 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

§ 5.1.6 <Reserved for Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price>

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

§ 5.2.1.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the County 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 A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 the Contractor has submitted a final accounting for the Cost of the Work, Determination of the Cost of the Work when payment is on the basis of the Cost of the Work, with or without a Guaranteed Maximum payment; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect / Engineer; such final payment shall be made by the County no later than 30 days after the issuance of the final Certificate for Payment or Project Certificate for Payment.

§ 5.2.2 <Reserved for Final Payment Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price>

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect / Engineer will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

N/A

§ 6.2 Binding Resolution for Any Unresolved Claims

For any Claim subject to, but not resolved by the Initial Decision Maker, the only method of resolution shall be as follows:

Litigation shall be exclusively held in the Court of Common Pleas of Bucks County.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the County or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the County's convenience in accordance with Article 14 of AIA Document A232–2019, then the County shall pay the Contractor a termination fee as follows:

N/A

§ 7.1.2 The Work may be suspended by the County as provided in Article 14 of AIA Document A232–2019.

§ 7.2 <Reserved for Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price>

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

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§ 8.2 The County's representative:

Bernard Griggs, Project and Diversity Officer
County of Bucks
55 E Court Street
Doylestown PA 18901

§ 8.3 The Contractor's representative:

§ 8.4 Neither the County's nor the Contractor's representative shall be changed without 10 days' prior notice to the other party.

§ 8.5 Insurance and Bonds

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A232–2019.

100% Performance Bond
100% Labor and Materials Payment Bond
10% Maintenance Bond

The vendor awarded this contract is required to provide a Certificate of Insurance that contains a minimum of the following coverage and limits:

Commercial General Liability - (policy to include premises and operations, products/completed operations and blanket contractual liability- the contractual section of the coverage must cover this agreement and limit applies to a project specific basis)

General Aggregate Limit	$2,000,000.
Products & Completed Operations Aggregate Limit	$2,000,000.
Each Occurrence Limit	$1,000,000.

Automobile Liability - to include owned, non-owned and hired vehicles:

Combined Single Limit	$1,000,000.

Special Insurance Coverage: If any of the following exposures exist from the project/worksite, the appropriate coverage must be specifically identified on the Certificate of Insurance **and** a sub-limit if applicable.

"X, C, U" (Explosion, Collapse, Underground) Coverage

Each occurrence limit	$1,000,000.

Professional Liability, Errors and Omissions– ***usually used for professional services***

Each Jobsite limit	$1,000,000.
General Aggregate limit	$2,000,000.

Excess Liability - coverage is to be in an umbrella form, any restrictions or limitations in coverage should be specified on the certificate of insurance:

Each Occurrence	$2,000,000.
Aggregate Limit	$2,000,000.

Workers Compensation	Statutory
and Employer's Liability:	
Bodily Injury by Accident	$ 100,000. ea. accident
Bodily Injury by Disease	$ 100,000. ea. employee

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Bodily Injury by Disease $ 500,000. policy limit

Waiver of Subrogation in favor of the County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions applies under all policies.

When it applies, Additional Insured shall read: The County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions and [as applicable] the Construction Manager, Architect/Engineer and their employees, directors, and officers shall be included as additional insured on a primary and non-contributory basis with respect to the work performed for this contract: **Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22.**

Cancellation Clause shall read: Should any of the above-described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Certificate Holder - County of Bucks Board of Commissioners, Attn: Office of the Controller, 55 East Court St, Doylestown PA 18901.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, 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:

N/A

§ 8.7 Relationship of the Parties

Where the Contract is based on the Cost of the Work plus the Contractor's Fee, with or without a Guaranteed Maximum Price, the Contractor accepts the relationship of trust and confidence established by this Agreement and covenants with the County to cooperate with the Architect / Engineer and exercise the Contractor's skill and judgment in furthering the interests of the County; to furnish efficient business administration and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the County's interests. The County agrees to furnish and approve, in a timely manner, information required by the Contractor and to make payments to the Contractor in accordance with the requirements of the Contract Documents.

§ 8.8 Other provisions:

N/A

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents and those documents referenced therein:

.1 AIA Document A132™–2019, Standard Form of Agreement Between County and Contractor, Construction Manager as Adviser Edition

.2 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.3 Drawings

Number	Title	Date
See Invitation to Bid		

.4 Specifications

Section	Title	Date	Pages
See Invitation to Bid			

.5 Addenda, if any:

Number	Date	Pages

Init.

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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 Additional documents, if any, forming part of the Contract Documents are listed below:

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

COUNTY OF BUCKS **BOARD OF COMMISSIONERS**	**CONTRACTOR**
Robert J. Harvie Jr., *Chair*	*(Signature)*
Diane M. Ellis-Marseglia, *LCSW, Vice Chair*	*(Printed name)*
Gene DiGirolamo, *Secretary*	*(Printed title)*
Gail Humphrey, Chief Clerk *Date*	

(Paragraphs deleted)

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SECTION 00 61 13 - PERFORMANCE / PAYMENT / MAINTENANCE BOND

THE COUNTY OF BUCKS HAS PROVIDED THIS SAMPLE CONSOLIDATED BOND FOR SUMBISSION TO A BIDDER'S INSURANCE/BONDING COMPANY. LANGUAGE SUBSTANTIALLY SIMILAR TO THIS WILL BE ACCEPTED IN A CONSOLIDATED BOND OR INDIVIDUAL PERFORMANCE BOND, PAYMENT BOND AND MAINTENANCE BOND.

CONSOLIDATED BOND FORM

A. 100% Performance Bond
B. 100% Payment of Labor & Material Bond
C. 10% Maintenance Bond

KNOW ALL MEN BY THESE PRESENT THAT WE, the undersigned,

_____ as Principal, and

_____ as the Surety, are held and firmly bound unto the County of Bucks, and as hereinafter set forth, in the full and just several sum of

(A)_____Dollars (_____)
for faithful performance of the contract as designated in Paragraph "A" and

(B)_____Dollars (_____)
for payment of labor and materials as designated in Paragraph "B" and

(C)_____Dollars (_____)
to guarantee remedy of defects as designated in Paragraph "C" lawful money of the United States of America, to be paid to the County of Bucks or its assigns, to which payment well and truly to be made and one, we bond ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by the presents.

Sealed with our respective seals and dated this _____ day of _____ 20 __.

WHEREAS, the above bounden Principal has entered into a contract with County of Bucks, bearing even date herewith, for Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22 upon certain terms and conditions in said contract more particularly mentioned, and:

WHEREAS, it is one of the conditions of the award of County of Bucks pursuant to which said contract is about to be entered into, that these presents be executed.

NOW THEREFORE, the joint and several conditions of this obligation are such:

"A" – That if the above bounden Principal as Contractor shall well and faithfully do and perform the things agreed by him to be done and performed according to the terms of the said Contract therein referred to and made a part thereof and such alterations as may be made in said work as therein provided and which are hereby made a part of this Bond the same as though they were set forth herein,

and shall indemnify and save harmless the said the County of Bucks and all of its officers, agents and employees from any expenses incurred through the failure of said Contractor and any of its subcontractors to complete the work as specified and for any damages growing out of the manner of performance of said Contract by said Contractor or his subcontractors or his or their agents or servants, including patent, trademark and copyright infringements; then this part of this obligation shall be void; otherwise it shall be and remain in full force and effect.

"B" – That if the above bounden Principal shall and will promptly pay or cause to be paid, all sums of money which may be due any person, co-partnership, association or corporation including any subcontractors for all material furnished and labor supplied or performed in the prosecution of the work, whether or not the said material or labor enter into and become component parts of the work or improvement contemplated, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

"C" – That if the above bounden Principal shall remedy without cost to the said the County of Bucks any defects which may develop during the period of one year from date of completion and acceptance of the work performed under said Contract, provided such defects, in the judgment of the County of Bucks or its successors, are caused by defective or inferior materials or workmanship, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

It is further agreed that any alterations which may be made in the terms of the contract or in the work to be done or materials to be furnished or labor to be supplied or performed under it or the giving by the County of Bucks of any extension of time for the performance of the contract or any other forbearance on the part of either the County of Bucks or the Principal and the Surety or Sureties or either or any of them, their heirs, executors, administrators, successors or assigns, from their liability hereunder, notice to the Surety or Sureties or any such alterations, extension, or forbearance being hereby waived.

The Principal and Surety hereby jointly and severally agree with the oblige herein that every person, co-partnership, association or corporation who, whether as subcontractor or otherwise, has furnished material or supplied or performed labor in prosecution of the work as above provided and who has not been paid therefore, may sue in assumption of this bond in the name of the County of Bucks for his, their, or its use, prosecute the same to final judgment for such sum or sums as may be justly due him, them, or it and have execution thereon; provided, however, that the County of Bucks shall not be liable for the payment of any costs or expenses of any such suit and further provided that the subcontractors or otherwise shall not have the right to sue or bring action against the County of Bucks directly.

IN WITNESS WHEREOF, the said Principal and Surety have duly executed this bond under seal the day and year above written.

WITNESS:

_____
(Principal)

_____ BY:_____
(Signature of Principal)

_____
(Type Name and Title of Principal's Signatory)

_____
(Type Name of Surety Co.)

_____ BY:_____
(Signature of Attorney-in-Fact)

AIA® Document A232™ – 2019

General Conditions of the Contract for Construction, *Construction Manager as Adviser Edition*

for the following PROJECT:

Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County
Spec #39-07/22

THE CONSTRUCTION MANAGER:

Pennoni Associates, Inc
1501 Main Street, Suite 220, Warrington PA 18976

THE OWNER:

County of Bucks
55 E. Court Street
Doylestown PA 18901

THE ARCHITECT / ENGINEER:

Kelly Maiello Associates, 1420 Walnut Street, 15th Floor, Philadelphia PA 19102
Voith & Mactavish Architects, 2401 Walnut Street, 6th Floor, Philadelphia PA 19103

This Document has been prepared AND significantly modified by the County of Bucks. The Documents are made available only for the purpose of obtaining Bids for this Project. Their availability does not grant a license for other purposes.

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

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

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

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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 County and Contractor (hereinafter the Agreement) and consist of the Invitation to Bid, 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. The Contract Documents also include a Modification which is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive and/or (4) a written order for a minor change in the Work issued by the Architect/Engineer.

§ 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/Engineer or the Architect/Engineer's consultants, (2) between the County and the Construction Manager or the Construction Manager's consultants, (3) between the County and the Architect/Engineer or the Architect/Engineer's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the County and a Subcontractor or Sub-subcontractor, (6) between the Construction Manager and the Architect/Engineer, or (7) between any persons or entities other than the County and Contractor. The Construction Manager and Architect/Engineer shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

(Paragraph deleted)

§ 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 other Contractors and by the County's own forces and Separate Contractors.

(Paragraph deleted)

§ 1.1.5 Contractors. Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the County that are administered by the Architect/Engineer and Construction Manager.

§ 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the County not administered by the Architect/Engineer and Construction Manager.

(Paragraph deleted)

§ 1.1.7 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.

§ 1.1.8 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.

(Paragraph deleted)

§ 1.1.9 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 Architect/Engineer and the Architect/Engineer'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.

§ 1.1.10 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 and certify termination of the Agreement under Section 14.2.2. The Initial Decision Maker shall not show partiality to the County or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

(Paragraph deleted)

§ 1.1.11 Bidder. Person or entity submitting a Bid.

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§ 1.1.12 Bid Sum. Monetary Sum identified in the Bid submission.

(Paragraph deleted)
§ 1.1.13 Contractor. Successful Bidder, i.e., Bidder to whom Contract is awarded.

§ 1.1.14 County. County of Bucks, its agents, employees and/or authorized representative.

(Paragraph deleted)
§ 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.

(Paragraph deleted)
§ 1.2.2 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.
§ 1.2.2.1 In the event of a conflict or an inconsistency in or among the Contract Documents, or between the Contract Documents and applicable codes in effect at the time the Contract Sum is bid or negotiated, the Contractor shall, unless directed otherwise in writing by an Addendum, Change Directive, or Change Order, provide the greatest quantity, highest quality, highest degree of safety and most stringent material, equipment or Work.

(Paragraph deleted)
§ 1.2.2.2 Should the Drawings or the Specifications disagree in themselves or with each other, the Contractor shall provide the better quality or greater quantity of work and/or materials unless otherwise directed by written modification to the Contract in accordance with applicable provisions of these Conditions.

(Paragraphs deleted)
§ 1.2.2.3 Whenever the terms "approval" or "approved", "acceptable", "satisfactory", "proper" or other general qualifying terms are used in the Contract Documents, it shall be understood that reference is made to the ruling judgment of the Architect/Engineer and Construction Manager. The terms "approved" or "approval" mean written approval.

(Paragraph deleted)
§ 1.2.2.4 Any material or operation specified by reference to published specifications of Society, Association, Code or other published standard shall comply with requirements of the listed document 30 days prior to receipt of bids. In a conflict between referenced document and Project Specifications, Project Specifications shall govern. In a conflict between referenced documents, the more stringent requirements shall govern. Abbreviations of technical organization titles not defined in the Project Specifications shall be interpreted by Architect/Engineer.

(Paragraphs deleted)
§ 1.2.2.5 The Contract Documents executed or identified in accordance with Subparagraph 1.1.8 shall prevail in case of an inconsistency with subsequent versions made through manipulatable electronic operations involving computers.

(Paragraphs deleted)
§ 1.2.3 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.

(Paragraphs deleted)
§ 1.2.4 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.

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§ 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/Engineer and the Architect/Engineer'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/Engineer's, or Architect/Engineer'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 Architect/Engineer and/or County.

§ 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.

§ 1.6.3 Notice to be given to County of Bucks Law Department and County Representative for Notice of Claim and Notice of Termination.

§ 1.7 Digital Data Use and Transmission

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

§ 1.8 Building Information Models Use and Reliance

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

ARTICLE 2 COUNTY

§ 2.1 General

§ 2.1.1 The County is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number as the County. The County shall designate in writing a representative who shall have express authority to bind the County with respect to all matters requiring the County's approval or authorization. Except as

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otherwise provided in Section 4.2.1, the Construction Manager and the Architect/Engineer do not have such authority. The term "County" means the County of Bucks or the County's authorized representative.

§ 2.1.2 The County shall furnish to the Contractor within 15 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 County's interest therein.

§ 2.2 Evidence of the County's Financial Arrangements

§ 2.2.1 The Contractor may only request in writing that the County provide reasonable evidence that the County has made financial arrangements to fulfill the County's obligations under the Contract if (1) the County fails to make payments to the Contractor as the Contract Documents require; or (2) the Contractor identifies in writing a reasonable concern regarding the County's ability to make payment when due. The County shall furnish such evidence as a condition precedent to continuation of the Work. After the County furnishes the evidence, the County shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Where the County 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 days' notice to the County, 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 County

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.8.1, the County 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. Unless otherwise provided under the Contract Documents, the County, assisted by the Construction Manager, shall secure and pay for the building permit.

§ 2.3.2 When deemed necessary the County shall retain an Architect/Engineer lawfully licensed to practice Architecture/Engineering in the jurisdiction where the Project is located. That person or entity is identified as the Architect/Engineer in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 When deemed necessary, the County shall retain a construction manager lawfully licensed to practice construction management or an entity lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 If the employment of the Construction Manager or Architect/Engineer terminates, the County shall employ a successor construction manager or architect/engineer whose status under the Contract Documents shall be that of the Construction Manager or Architect/Engineer, respectively.

§ 2.3.5 The County 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 County but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.6 The County shall furnish information or services required of the County by the Contract Documents with reasonable promptness. The County shall also furnish any other information or services under the County'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.

§ 2.3.7 Unless otherwise provided in the Contract Documents, the County shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.

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§ 2.3.8 The County shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6

§ 2.4 County's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the County 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 County to stop the Work shall not give rise to a duty on the part of the County 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 County'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 10 day period after receipt of notice from the County to commence and continue correction of such default or neglect with diligence and promptness, the County may, without prejudice to other remedies the County may have, correct such default or neglect. Such action by the County and amounts charged to the Contractor are both subject to review by the Construction Manager and prior approval of the Architect/Engineer, and the Construction Manager or Architect/Engineer 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 County for the reasonable cost of correcting such deficiencies, including County's expenses and compensation for the Construction Manager's and Architect/Engineer's and their respective consultants' additional services made necessary by such default, neglect or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the County. If the Contractor disagrees with the actions of the County or the Architect/Engineer, or the amounts claimed as costs to the County, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager or Architect/Engineer in their 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 County pursuant to Section 2.3.5, 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 Construction Manager and Architect/Engineer any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect/Engineer may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Construction Manager and Architect/Engineer any nonconformity discovered by or made known to the Contractor as a

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request for information submitted to Construction Manager in such form as the Construction Manager and Architect/Engineer may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect/Engineer 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 County, subject to section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the County or Architect/Engineer 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.

§ 3.2.4.1 The Contractor shall perform no portion of the Work at any time without Contract Documents or where required, approved Shop Drawings, Product Data or Samples for such portion of the Work.

§ 3.2.4.2 Should the Contractor elect to release work without approvals, same shall be at his own risk and expense. Such work, if it is determined by the Architect/Engineer and Construction Manager to not be in accordance with the requirements of the Contract Documents, shall be removed and replaced without additional cost or extension of time.

§ 3.2.4.3 In the event of any conflict among the Contract Documents, the Contractor shall notify the County and the Architect/Engineer of same and follow and comply with their interpretation of same. In the event that the County and Architect/Engineer fail to respond to the Contractor's notifications within a reasonable period of time, then the Documents shall be construed according to the following priorities:

Highest Priority:	Change Orders
Second Priority:	Modifications to the Agreement
Third Priority:	Agreement
Fourth Priority:	Specifications
Fifth Priority:	Schedules
Sixth Priority:	Large scale detail drawings (detail drawings having a scale of ¾" and over)
Seventh Priority:	Large scale plan and section drawings (plan and section drawings having a scale equal to or larger than that used for the basic floor plan, as the case may be)
Eighth Priority:	Small scale detail drawings (detail drawings having a scale less than ¾")
Ninth Priority:	Small scale plan and section drawings (plan and Section drawings having a scale less than that used on the basic floor plan, as the case may be)

§ 3.2.5 The Contract is entered into by the County with the understanding that the Contractor, prior to submission of its Bid, acquainted itself with the requirements of all Bid Documents, all utilities in existence to which connections are to be made and other requirements of the Contract, and that the Contractor has obtained all necessary information for completion of the work on or before the date(s) specified. The Contractor shall not at any time after the execution of the Contract set up any claims whatsoever based upon insufficient data or incorrectly assumed conditions, nor shall the Contractor claim any misunderstanding in regard to the nature, conditions or character of the work to be done under the Contract, and Contractor shall assume all risk resulting from any changes in the conditions which may occur during the progress of the work.

§ 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 County, the Construction Manager, and the Architect/Engineer and shall propose alternative means, methods, techniques, sequences or procedures. The Architect/Engineer shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. The Construction Manager shall review the proposed alternative for sequencing, constructability, and coordination impacts on the other Contractors. Unless the Architect/Engineer or the Construction Manager objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences or procedures.

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§ 3.3.1.1 Contractor shall afford other Contractors retained by County and all subcontractors opportunity for introduction and storage of their materials and execution of their work, connect and coordinate his work with theirs and cooperate with the Architect/Engineer and with other Contractors so that work shall be done at proper time, in a manner not to delay others or increase costs.

§3.3.1.2 During the progress of the work, Contractor and subcontractors shall build in all material and apparatus furnished and set by other Contractors and subcontractors. Contractor and Subcontractors shall familiarize themselves with the work of every Contractor and subcontractor whose work affects or ties in with his own and shall be responsible for the finished results.

§ 3.3.2 The Contractor shall be responsible to the County 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 the Project already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

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

§ 3.4.2 Except in the case of minor changes in the Work approved by the Construction Manager or Architect/Engineer in accordance with Section 3.13.8 or ordered by the Architect/Engineer in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the County, after evaluation by the Architect/Engineer, in consultation with the Construction Manager, and in accordance with a Change Order or Construction Change Directive.

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

§ 3.4.4 All materials, patterns, shapes, dimensions, workmanship, methods and finish, in general and in detail, shall be such as shall be ordered or approved by the Construction Manager and Architect/Engineer.

§ 3.4.5 All materials and workmanship may be rejected by the Construction Manager and Architect/Engineer if, in their opinion, they do not conform, in general and in detail, to these specifications and to the drawings, or to any drawings, descriptions and samples which the Contractor may furnish, when bidding or thereafter.

§ 3.4.6 All of the materials shall be delivered, and all of the different parts of the work shall be executed, at the time and in the order and sequence which may be designated or approved by the Construction Manager and/or Architect/Engineer.

§ 3.4.7 As soon as any shipment, which the Contractor is required to unload, arrives to the specified jobsite, it shall be under the care of the Contractor, who shall henceforward be responsible for its safety, and who shall be liable for any demurrage or other costs on account of failure to immediately remove from the jobsite, any shipments which may be acceptable under these Specifications.

§ 3.4.8 Upon the refusal, neglect or failure of the Contractor to deliver any portion of the material, or to do or complete any part of the work, when, within the time named in the Contract, the Construction Manager or Architect/Engineer shall order the same to be delivered or completed, the Construction Manager or Architect/Engineer may order such portions of the material elsewhere, and employ such labor as he may require to do the said work, and charge the cost thereof to the account of the Contractor.

§ 3.4.9 All materials used and all parts and labor furnished for the replacing or making good of any defective materials or workmanship shall be at the expense of the Contractor, with no extra allowance therefore by the County.

§ 3.4.10 Should the Contractor fail to promptly make good, to the satisfaction of the Construction Manager, any defect, or fail to remove from the work any material which the Construction Manager or Architect/Engineer shall pronounce imperfect, the

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Construction Manager may employ workmen to remedy such defect or to remove such materials, and may order such other material elsewhere as may be required to replace that which is removed, and the cost of all such labor and material shall be charged to the account of the Contractor.

§ 3.5 Inspections and Tests

§ 3.5.1 Contractor shall give Construction Manager and Architect/Engineer timely notice of readiness of the work for all required inspections, tests or approvals. If laws or regulations of any public body having jurisdiction require any work (or part thereof) to specifically be inspected, tested or approved, Contractor shall assume full responsibility therefore, pay all costs in connection therewith, and furnish Construction Manager and Architect/Engineer the required certificates of inspection, testing or approval. Contractor shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with County's or Architect/Engineer's acceptance of a supplier of materials or equipment proposed to be incorporated in the work, or of materials or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the work. All inspections, tests, or approvals other than those required by laws or regulations of any public body having jurisdiction shall be performed by organizations acceptable to County and Contractor (or by Architect/Engineer if so specified).

§ 3.5.2 If any work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence it must, if requested by the Construction Manager or Architect/Engineer, be uncovered for observation. Such uncovering shall be at Contractor's expense unless Contractor has given the Construction Manager timely notice of Contractor's intention to cover the same and the Construction Manager has not acted with reasonable promptness in response to such notice.

§ 3.5.3 If Architect/Engineer considers it necessary or advisable that covered work be observed by the Architect/Engineer or inspected or tested by others, the Contractor, at the Architect/Engineer's request, shall uncover, expose or otherwise make available for inspection or testing as Architect/Engineer may require, that portion of the work in question, furnishing all necessary labor, material and equipment. If it is found that such work is defective, the Contractor shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction (including, but not limited to fees and charges of engineers, architects, attorneys and other professionals), and County shall be entitled to an appropriate decrease in the contract price. If, however, such work is not found to be defective, the Contractor shall be allowed an increase in the contract price or an extension of the contract completion time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction.

§ 3.5.4 The Architect/Engineer, or his/her representative, shall be afforded all opportunities, and all convenient facilities that may be requested to inspect and test all materials and appliances, in the shops, on the ground, or elsewhere, and the Contractor shall subject each and all of the installations to such tests as shall satisfy the Architect/Engineer that all of these specifications have been complied with, before the installations shall be eligible for final acceptance. Any or all such inspections or tests shall be for the sole benefit of the County and shall be for the purpose of ascertaining whether the work complies with Contract requirements as set forth herein. Such observations shall not create or constitute a duty on the part of the Architect/Engineer to the Contractor, its agents, employees or guests to perform such observations. The Contractor shall at all times be solely responsible for compliance with job safety requirements as set forth herein.

§ 3.5.5 No materials or workmanship will be considered as accepted, which may be found to be defective in manufacture, construction or execution, or deficient in any of the requirements of these specifications, in consequence of any negligence of any inspector or subordinate Architect/Engineer to point out said defect or deficiency, during or subsequent to manufacture, and during the entire progress of work; and the Contractor will be required to correct any imperfect work, remedy, and make good or replace any defective material, whenever discovered, before the final acceptance of the work and before the release of the Surety of the Contractor.

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

§ 3.5.7 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 Construction Manager for transmittal to the Architect/Engineer.

§ 3.6 Warranty

§ 3.6.1 The Contractor warrants to the County, Construction Manager, and Architect/Engineer that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The

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Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects in workmanship and materials. The Contractor agrees to promptly remedy, at the Contractor's expense, any defects which were caused, in the judgment of the County, by defective or inferior workmanship or materials. 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 Construction Manager or Architect/Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6.2 It shall be understood that the Contractor agrees to furnish such materials and appliances, and to construct the whole work in such substantial and workmanlike manner that it shall be continuously stable and efficient, and the Contractor shall promptly make good, or replace, any or all parts of the materials or installation, including all details, which may be found to be unstable or defective in any particular, ordinary wear and tear excepted, for a period of guarantee of one year after the whole installation has been entirely completed, tested and accepted by the County.

§ 3.6.3 The acceptance, after inspection by the Construction Manager and Architect/Engineer, of any portion of the work or material, shall be subject to its freedom from the exhibition of any inherent or developed defect, or any failure to conform to the Specifications within this ITB, between the time of acceptance, and the expiration of the above named period of one year.

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

§ 3.7 Taxes

§ 3.7.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof 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.

§ 3.7.2 All Contractors, subcontractors, suppliers, etc. are required to pay all applicable taxes as required by law, outside of those taxes for which the County and project are exempt.

§ 3.7.3 Assignment of Refund Rights. The Contractor agrees to assign and transfer to the County all its rights to sales and use tax which may be refunded as a result of a claim for refund for materials purchased in connection with this Agreement. The County or its agent shall have the right to review the books and records of the Contractor and all subcontractors for the purpose of documenting and substantiating any such refund claim. Contractor and all subcontractors shall cooperate fully with County in pursuing any such refund claim and shall make available to the County any applicable documents. The Contractor further agrees that it will not file a claim for refund for any sales or use tax, which is the subject of this assignment.

§ 3.7.4 Access to Accounting Records. The Contractor shall check all materials, equipment and labor entering into the Work and shall keep such full and detailed accounts as may be necessary for proper financial management under this Agreement and the system shall be satisfactory to the County. The County or its representative shall be afforded access to all the Contractor's records, books, correspondence, instructions, drawings, receipts vouchers, memoranda, and similar data relating to this Agreement, and the Contractor shall preserve all such records for a period of three years, or for such longer periods as may be required by law, after the final payment.

§ 3.8 Permits, Fees, Notices, and Compliance with Laws

§ 3.8.1 Unless otherwise provided in the Contract Documents, the County, through the Construction Manager, shall secure and pay for the building permit. The Contractor shall secure and pay 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.

§ 3.8.2 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.

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

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§ 3.8.4 The Contractor shall pay for all royalties, claims, and fees for any patented invention, article, or arrangements, which may be used in the work under this Agreement.

§ 3.8.5 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 County before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Construction Manager will promptly investigate such conditions and, if the Architect/Engineer, in consultation with the Construction Manager, 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/Engineer, in consultation with the Construction Manager, 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/Engineer shall promptly notify the County, Construction Manager, and Contractor in writing and stating the reasons.

§ 3.8.6 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 County, Construction Manager, and Architect/Engineer. Upon receipt of such notice, the County 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 County 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.

§ 3.9 Allowances

§ 3.9.1 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 County may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.9.2 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 3.9.2.1 and (2) changes in Contractor's costs under Section 3.9.2.2.

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

§ 3.10 Superintendent

§ 3.10.1 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.

§ 3.10.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the County and Architect/Engineer through the Construction Manager, the name and qualifications of a proposed superintendent. The Construction Manager may reply within 14 days to the Contractor in writing stating (1) whether the County, the Construction Manager, or the Architect/Engineer has reasonable objection to the proposed superintendent or (2) that any of them require additional time to review. Failure of the Construction Manager to reply within the 14-day period shall constitute notice of no reasonable objection.

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

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§ 3.11 Contractor's Construction Schedules

§ 3.11.1 The Contractor, promptly after being awarded the Contract, shall submit for the County's and Architect/Engineer's information and the Construction Manager's use in developing the Project schedule a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors or the construction or operations of the County's own forces or Separate Contractors.

§ 3.11.2 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 Construction Manager's and Architect/Engineer's approval. The Architect/Engineer and Construction Manager's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Construction Manager and Architect/Engineer 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.

§ 3.11.3 The Contractor shall participate with other Contractors, the Construction Manager and the County in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.11.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the County, Construction Manager and Architect/Engineer and incorporated into the approved Project schedule.

§ 3.12 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 Construction Manager, Architect/Engineer and County and delivered to the Construction Manager for submittal to the County upon completion of the Work as a record of the Work as constructed.

§ 3.13 Shop Drawings, Product Data, and Samples

§ 3.13.1 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.

§ 3.13.2 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.

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

§ 3.13.4 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/Engineer and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect/Engineer are 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 Construction Manager or Architect/Engineer without action.

§ 3.13.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Construction Manager Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the Project submittal schedule approved by the Construction Manager and Architect/Engineer or in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in

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the activities of other Contractors, Separate Contractors, or the County's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples and similar submittals with related documents submitted by other Contractors.

§ 3.13.6 Within seven days after receipt of fully executed Agreement and Purchase Order, the Contractor shall submit for review a preliminary schedule of shop drawing submissions.

§ 3.13.7 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the County, Construction Manager, and Architect/Engineer, 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.

§ 3.13.8 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 reviewed and approved by the Construction Manager or Architect/Engineer.

§ 3.13.9 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/Engineer's approval of Shop Drawings, Product Data, Samples or similar submittals, unless the Contractor has specifically notified the Construction Manager and Architect/Engineer of such deviation at the time of submittal and (1) the Architect/Engineer 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/Engineer's approval thereof.

§ 3.13.10 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 Construction Manager and Architect/Engineer on previous submittals. In the absence of such notice, the Architect/Engineer's approval of a resubmission shall not apply to such revisions.

§ 3.13.11 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.

§ 3.13.11.1 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 County and the Architect/Engineer will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect/Engineer. The County, the Construction Manager and the Architect/Engineer 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 County and Architect/Engineer have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.13.11, the Architect/Engineer will review, 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. The Construction Manager shall review submittals for sequencing, constructability, and coordination impacts on other Contractors.

§ 3.13.11.2 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 Construction Manager and Architect/Engineer at the time and in the form specified by the Architect/Engineer.

§ 3.14 Use of Site

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

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§ 3.14.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 3.14.3 The Contractor shall be responsible for obtaining proper parking permits (if required) for all vehicles which will be parked on or off site. All costs for parking permits and for fines due to improperly parked vehicles are the responsibility of the Contractor. Contractor is to assume there is no parking available on site.

§ 3.14.4 The County reserves the right to grant or deny permission for the erection of signs or advertisements of any kind, including Project Sign, on the building, site enclosure or premises. The Contractor shall not display or permit to be displayed any sign, trademark, poster or other advertising devices on or about the building, site enclosure or premises, except as may be required for proper conduct of the work, as a directory of Contractors engaged in the work for emergency, or as may be specified.

§ 3.14.5 All Contractors shall confine their use of the premises for all purposes, to the areas occupied by the construction and related storage areas.

§ 3.14.6 The Contractor shall send proper notices, make all necessary arrangements and perform all other services required in order to protect and maintain all marked, identified or known public utilities such as fire lines and plugs, electric, gas, water lines, sewer pipes, mechanical systems and all other items of this nature, and assume all responsibility and pay all costs for which the County may be liable if said services are interrupted by actions of the Contractor or subcontractors. Contractor acknowledges that all public utilities or other infrastructure may not be identified or marked, and that Contractor has taken all reasonable precautions to identify all known and unknown utilities or other infrastructure.

§ 3.15 Cutting and Patching

§ 3.15.1 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.

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

§ 3.15.3 All work that may be cut, damaged, disturbed or otherwise interfered with during the progress of the work of the various trades shall be fully, properly and carefully patched, repaired and made good by Contractor in a first-class manner satisfactory to the Architect/Engineer by the Contractor whose work has been cut or damaged and requires repair.

§ 3.16 Cleaning Up / Damages to Premises

§ 3.16.1 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.

§ 3.16.2 If the Contractor fails to clean up as provided in the Contract Documents, the County, or Construction Manager with the County's approval, may do so and the County shall be entitled to reimbursement from the Contractor.

§ 3.17 Access to Work

The Contractor shall provide the County, Construction Manager and Architect/Engineer with access to the Work in preparation and progress wherever located.

§ 3.18 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 County, Construction Manager and Architect/Engineer 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

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Drawings, Specifications, or other documents prepared by the County, Architect/Engineer, or Construction Manager. 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/Engineer through the Construction Manager.

§ 3.19 Indemnification

§ 3.19.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the County, Construction Manager, Architect/Engineer, Construction Manager's and Architect/Engineer'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, 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), 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 3.19.

§ 3.19.2 In claims against any person or entity indemnified under this Section 3.19 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 3.19.1 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 / ENGINEER AND CONSTRUCTION MANAGER

§ 4.1 General

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

§ 4.1.2 The Construction Manager is the person or entity retained by the County pursuant to Section 2.3.3 and identified as such in the Agreement.

§ 4.1.3 If a Construction Manager is not retained, the County shall undertake duties and responsibilities of Construction Manager as set forth herein.

§ 4.1.4 Duties, responsibilities and limitations of authority of the Construction Manager and Architect/Engineer as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the County, Construction Manager, Architect/Engineer and Contractor. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Construction Manager and Architect/Engineer will provide administration of the Contract as described in the Contract Documents and will be the County's representatives during construction until the date the Construction Manager issues the final Certificate for Payment (AIA G702 – Schedule of Value, AIA G703 – Payment of Value or equivalent). The Construction Manager and Architect/Engineer will have authority to act on behalf of the County only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect/Engineer will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the County, 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/Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect/Engineer will keep the County and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the County and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the County and Architect/Engineer reasonably informed of the

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progress of the Work, and will promptly report to the County and Architect/Engineer known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will direct scheduling and coordination of the activities of the General Contractor and other Contractors as deemed necessary, in accordance with the latest approved Project schedule to maintain all completion dates. Direction is to be adhered to as provided.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect/Engineer 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, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect/Engineer will have control over or charge of or be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.
§ 4.2.5.1 The Construction Manager will oversee coordination of the activities of all Contractors under the Project. All Contractors are required to cooperate fully with the Construction Manager. All Contractors shall attend weekly coordination meetings. No claims by any Contractor for delay or cost will be entertained if the County determines that said Contractor has been uncooperative with the Construction Manager.

§ 4.2.6 Communications. The County shall communicate with the Contractor and the Construction Manager's consultants through the Construction Manager about matters arising out of or relating to the Contract Documents. The County and Construction Manager shall include the Architect/Engineer in all communications that relate to or affect the Architect/Engineer's services or professional responsibilities. The County shall promptly notify the Architect/Engineer of the substance of any direct communications between the County and the Construction Manager otherwise relating to the Project. Communications by and with the Architect/Engineer's consultants shall be through the Architect/Engineer. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with other Contractors shall be through the Construction Manager Communications by and with the County's own forces and Separate Contractors shall be through the County. The Contract Documents may specify other communication protocols.

§ 4.2.7 The Construction Manager and Architect/Engineer will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect/Engineer and Construction Manager have authority to reject Work that does not conform to the Contract Documents and will notify each other about the rejection. The Construction Manager shall determine in general whether the Work of the Contractor is being performed in accordance with the requirements of the Contract Documents and notify the County, Contractor and Architect/Engineer of defects and deficiencies in the Work. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require inspection or testing of the Work, upon written authorization of the County, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.19 through 4.2.21 inclusive, with respect to interpretations and decisions of the Architect/Engineer. However, neither the Architect/Engineer's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect/Engineer or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the County's consultants, County's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect/Engineer for approval.

§ 4.2.10 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data, and Samples. Where there are other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other Contractors and transmit to the Architect/Engineer those recommended for approval. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Construction Manager represents to the County and Architect/Engineer that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect/Engineer or, in the

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absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect/Engineer.

§ 4.2.11 The Architect/Engineer 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/Engineer's action will be taken in accordance with the submittal schedule approved by the Architect/Engineer or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect/Engineer's professional judgment to permit adequate review. Upon the Architect/Engineer's completed review, the Architect/Engineer shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the Construction Manager and Architect/Engineer 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 Construction Manager and Architect/Engineer'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 Construction Manager and Architect/Engineer's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Construction Manager and Architect/Engineer, of any construction means, methods, techniques, sequences, or procedures. The Architect/Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.2.14 The Construction Manager and the Architect/Engineer will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect/Engineer will have authority to order minor changes in the Work as provided in Section 7.4. The Architect/Engineer, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.8.5.

§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the County one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect/Engineer and the Contractor and will be delivered to the County upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect/Engineer in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect/Engineer pursuant to Section 9.8; and receive and forward to the County written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect/Engineer a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

§ 4.2.17 If the County and Architect/Engineer agree, the Architect/Engineer will provide one or more Project representatives to assist in carrying out the Architect/Engineer's responsibilities at the site. The County shall notify the Construction Manager of any change in the duties, responsibilities and limitations of authority of the Project representatives.

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

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

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

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§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor and forward each request for information to the Architect/Engineer t, with the Construction Manager's recommendation. The Architect/Engineer will review and respond in writing, through the Construction Manager, to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect/Engineer's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect/Engineer will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

§ 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 Construction Manager, for review by the County, Construction Manager and Architect/Engineer, 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 Construction Manager may notify the Contractor whether the County, the Construction Manager or the Architect/Engineer (1) has reasonable objection to any such proposed person or entity or, (2) requires additional time for review. Failure of the Construction Manager to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the County, Construction Manager or Architect/Engineer has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the County, Construction Manager or Architect/Engineer has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the County, Construction Manager or Architect/Engineer 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 County, Construction Manager or Architect/Engineer 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 County, Construction Manager and Architect/Engineer. Each subcontract agreement shall preserve and protect the rights of the County, Construction Manager and Architect/Engineer 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 County. 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

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variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

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

.1 assignment is effective only after termination of the Contract by the County for cause pursuant to Section 14.2 and only for those subcontract agreements that the County 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 County accepts the assignment of a subcontract agreement, the County 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 County under this Section 5.4, the County may further assign the subcontract to a successor Contractor or other entity. If the County assigns the subcontract to a successor Contractor or other entity, the County shall nevertheless remain legally responsible for all of the successor Contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY COUNTY OR BY OTHER CONTRACTORS

§ 6.1 County's Right to Perform Construction with Own Forces and to Award Other Contracts

§ 6.1.1 The County reserves the right to perform construction or operations related to the Project with the County'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 the County performs construction or operations with its own forces or Separate Contractors, the County shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

§ 6.1.3 Unless otherwise provided in the Contract Documents, when the County performs construction or operations related to the Project with the County's own forces or with Separate Contractors, the County 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.

§ 6.1.4 The Contractor shall, in such manner as the Construction Manager or Architect/Engineer may require, so arrange the execution of the work as not to unnecessarily interfere with the execution of any other work which may be in progress or with the existing system. If any part of Contractor's work depends for proper execution or results upon the work of any such other contractor or utility or the County, Contractor shall inspect and promptly report to Engineer in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. Contractor's failure to do so will constitute an acceptance of the work as fit and proper for integration with Contractor's work except for latent or non-apparent defects and deficiencies in the other work.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the County's own forces, Separate Contractors, Construction Manager and other 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 County's own forces, Separate Contractors or other Contractors, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Construction Manager and Architect/Engineer of apparent discrepancies or defects in the construction or operations by the County or Separate Contractor or other Contractors that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Construction Manager and the Architect/Engineer of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the County's or Separate Contractor's or other Contractors' completed or partially completed construction is fit and proper

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to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the County or Separate Contractors or other Contractors that are not apparent.

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

§ 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 County, Separate Contractors, or other Contractors as provided in Section 10.2.5.

§ 6.2.5 The County, Separate Contractors, and other Contractors shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.15.

§ 6.3 County's Right to Clean Up

§ 6.3.1 The contractor shall follow the County's "green initiative" requiring them to recycle as much refuse as possible.

§ 6.3.2 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project. Contractor is responsible for all dumpsters for their work and for the work of other Contractors. The Contractor shall be responsible for all cleaning and rubbish removal on a daily basis for their work and the work of all their Subcontractors. If the Contractor fails to clean up as provided in the Contract Documents, the County may do so and the County shall be entitled to reimbursement from the Contractor.

§ 6.3.3 If a dispute arises among the Contractor, Separate Contractors, other Contractors, and the County as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the County may clean up and the Construction Manager, with notice to the Architect/Engineer, will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 The County shall have the right without invalidating the Agreement and without notice to sureties, to order extra work or to make changes by altering, adding to, or deducting from the work as specified in the Agreement. Should such alterations or changes in the quantity or character of the work result in increased or decreased cost to the Contractor, a fair and equitable sum therefore, to be agreed upon in writing in advance by the Contractor and County, shall be added or deducted from the bid price, as the case may be. No allowance will be made for anticipated profits or deducted work.

§ 7.1.2 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.

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

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

§ 7.2 Change Orders

A Change Order is a written instrument prepared by the Construction Manager and signed by the County, Construction Manager and Contractor, 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

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.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Construction Manager and signed by the County, Construction Manager and Architect/Engineer, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The County 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 Construction Manager shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Construction Manager may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Construction Manager and Architect/Engineer;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Costs of supervision and field office personnel directly attributable to the change.

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

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Construction Manager 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 County for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Construction Manager and Architect/Engineer. 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 County, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Construction Manager and Architect/Engineer will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Construction Manager and Architect/Engineer determine to be

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reasonably justified. The 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 County and Contractor agree with a determination made by the Construction Manager and Architect/Engineer 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 Construction Manager shall prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive. All change orders are subject to final approval by the County Commissioners.

§ 7.4 Minor Changes in the Work

The Architect/Engineer 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/Engineer'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 Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect/Engineer's order for a minor change without prior notice to the 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.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect/Engineer 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 County in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and County.

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

§ 8.2.4 It is mutually agreed that damages to the County for failure of the Contractor to fully complete the work under this Contract on or before the stipulated date/time within the Contract shall be designated within the Agreement (A132-2009) for each calendar day after said date that shall elapse before the work is fully completed, which amount shall in no event be considered as a penalty, but as liquidated damages due the County because of said delay. The County may retain the amount thereof from any moneys which otherwise would be payable hereunder to the Contractor.

§ 8.2.5 In addition to the above, in order that the work may be accomplished in the shortest possible time, the Contractor, weather permitting, shall be required to have qualified workmen with designated foreman at work on-site at all times. Contractor's personnel shall remain on-site throughout the duration of the Contractor's work. At no time shall Contractor pull off project without the express consent of the County. In addition, no change in foreman shall be permitted without approval from the County. Contractor will be required to submit a detailed schedule for completion of work which will be subject to the review and approval of the County.

§ 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 Architect/Engineer, Construction Manager, or an employee of any of them, or of Separate Contractors, or other Contractors; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather

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conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the County; or (5) by other causes that the Contractor asserts and the Architect/Engineer, based on the recommendation of the Construction Manager, determines justify delay, then the Contract Time shall be extended for such reasonable time as the Architect/Engineer may determine.

§ 8.3.2 The Contractor shall not be entitled to any claim for damages on account of hindrances or delays in performance of this contract from any cause whatsoever, including acts or failures to act on the part of the County or Architect/Engineer or their agents, employees, or servants. The Contractor acknowledges and agrees that its sole remedy for any such delay in performance shall be an extension of contract completion time in accordance the terms of the Agreement.

§ 8.3.3 The Contractor may at any time during the performance of the contract request in writing an extension of time in performance based upon delays caused by factors beyond the control of the Contractor, such factors include labor stoppages (strikes), acts of God (natural disasters, unusually unseasonable weather), delays in delivery of materials caused by factors beyond the control of material suppliers and manufacturers. Written notice of expected delay and explanation therefore shall be made within 10 calendar days from the time the contractor is aware of the cause for delay, even though the expected duration or effect of delay is not yet known. As soon as possible after the impact of the delay is determined, the Contractor will submit in writing a request for extension of time for a specific number of calendar days with fully substantiated justification therefore. Such a request may entitle the Contractor to an extension of time as recommended by the Architect/Engineer and as agreed to in writing by the County. Time extensions granted under these provisions are solely to relieve the Contractor's liability for liquidated damages and will not justify an increase in the cost of the work.

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 County to the Contractor for performance of the Work under the Contract Documents.

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

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

§ 9.3.1 At least 15 days before the date established for each progress payment, the Contractor shall submit to the Construction Manager 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 County, Construction Manager or Architect/Engineer require, such as copies of requisitions, and releases or 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 Construction Manager and Architect/Engineer, 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.

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

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the County 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 County 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 Where there is only one Contractor, the Construction Manager will, within seven days after the Construction Manager's receipt of the Contractor's Application for Payment, review the Application, certify the amount the Construction Manager determines is due the Contractor, and forward the Contractor's Application and Certificate for Payment to the Architect/Engineer. Within seven days after the Architect/Engineer receives the Contractor's Application for Payment from the Construction Manager, the Architect/Engineer will either (1) issue to the County a Certificate for Payment, in the full amount of the Application for Payment, with a copy to the Construction Manager; or (2) issue to the County a Certificate for Payment for such amount as the Architect/Engineer determines is properly due, and notify the Construction Manager and County of the Architect/Engineer'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 Construction Manager and County of the Architect/Engineer's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward to the Contractor the Architect/Engineer's notice of withholding certification.

§ 9.4.2 Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect/Engineer.

§ 9.4.2.1 Within seven days after the Architect/Engineer receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect/Engineer will either (1) issue to the County a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the County a Project Certificate for Payment for such amount as the Architect/Engineer determines is properly due, and notify the Construction Manager and County of the Architect/Engineer's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and County of the Architect/Engineer's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect/Engineer's notice of withholding certification to the Contractors.

§ 9.4.3 The Construction Manager's certification of an Application for Payment or, in the case of more than one Contractor, a Project Application and Certificate for Payment, shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager'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, or Contractors are, entitled to payment in the amount certified.

§ 9.4.4 The Architect/Engineer's issuance of a Certificate for Payment or, in the case of more than one Contractor, Project Application and Certificate for Payment, shall be based upon the Architect/Engineer's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect/Engineer's certification will constitute a representation that, to the best of the Architect/Engineer's knowledge, information, and belief, the Work

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has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 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 Construction Manager or Architect/Engineer.

§ 9.4.6 The issuance of a Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect/Engineer 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 County 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 Construction Manager or Architect/Engineer may withhold a Certificate for Payment or Project Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the County, if in the Construction Manager's or Architect/Engineer's opinion the representations to the County required by Section 9.4.3 and 9.4.4 cannot be made. If the Construction Manager or Architect/Engineer is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and County as provided in Section 9.4.1 and 9.4.2. If the Contractor, Construction Manager and Architect/Engineer cannot agree on a revised amount, the Architect/Engineer will promptly issue a Certificate for Payment or a Project Certificate for Payment for the amount for which the Architect/Engineer is able to make such representations to the County. The Construction Manager or Architect/Engineer may also withhold a Certificate for Payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment or Project Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect/Engineer's opinion to protect the County from loss for which the Contractor is responsible, including loss resulting from the 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 County 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 County or a Separate Contractor or other 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;
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents.
- **.8** failure to maintain the site in a safe and satisfactory manner in accordance with construction practices as determined by the County or Architect/Engineer;
- **.9** any labor strike or labor disruption whatsoever which impacts the progress of the Work;
- **.10** claims made or likely to be made against the County or its property;
- **.11** loss caused by Contractor or its Subcontractors;
- **.12** failure of Contractor to correctly and accurately represent the Work performed in a payment request;
- **.13** Contractor's failure to use funds previously paid to Contractor to pay Project-related obligations;
- **.14** failure to update the Schedule(s); or
- **.15** failure to maintain Record Drawings.

§ 9.5.2 When either party disputes the Architect/Engineer'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/Engineer or Construction Manager withholds certification for payment under Section 9.5.1, the County 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 County makes

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payments by joint check, the County shall notify the Architect/Engineer and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect/Engineer has issued a Certificate for Payment or Project Certificate for Payment, the County shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Construction Manager and Architect/Engineer.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the County, 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 Construction Manager 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 County, Construction Manager and Architect/Engineer on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The County has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the County to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the County shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the County, Construction Manager nor Architect/Engineer 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 County shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the County 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 County. 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 County has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the County 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 County shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

§ 9.7.1 If the Construction Manager and Architect/Engineer do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within 14 days after the Construction Manager's receipt of the Contractor's Application for Payment, or if the County does not pay the Contractor within 45 days after the date established in the Contract Documents, the amount certified by the Construction Manager and Architect/Engineer or awarded by a final and unappealable judgement entered by a Court of competent jurisdiction, then the Contractor may, upon seven additional days' notice to the County, Construction Manager and Architect/Engineer, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.7.2 If the County is entitled to reimbursement or payment from the Contractor pursuant to the Contract Documents, such payment shall be made promptly upon demand by the County. Notwithstanding anything contained in the Contract Documents

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to the contrary, if the Contractor fails to promptly make any payment due the County, or if the County incurs any costs and expenses to cure any default of the Contractor, including costs paid to the other contractors as a result of the Contractor's performance, or to correct defective Work, the County shall have an absolute right to offset such amount against the Contract Sum and may, in the County's sole discretion, elect either to (i) deduct an amount equal to what which the County is entitled from any payment then or thereafter due the Contractor from County or (ii) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the County is entitled.

§ 9.8 Substantial Completion

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

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

§ 9.8.3 Upon receipt of the list, the Architect/Engineer, assisted by the Construction Manager, will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect/Engineer's inspection discloses any item, whether or not included on the list, which is not sufficiently complete in accordance with the Contract Documents so that the County 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/Engineer. In such case, the Contractor shall then submit a request for another inspection by the Architect/Engineer, assisted by the Construction Manager, to determine Substantial Completion.

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

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the County and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the County 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 County 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 County 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 and Construction Manager shall jointly prepare and submit a list to the Architect/Engineer 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 County and Contractor or, if no agreement is reached, by decision of the Architect/Engineer after consultation with the Construction Manager.

§ 9.9.2 Immediately prior to such partial occupancy or use, the County, Construction Manager, Contractor, and Architect/Engineer 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.

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

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a notice that the Work is ready for final inspection and acceptance and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendation to the Architect/Engineer when the Work of all of the Contractors is ready for final inspection and shall then forward the Contractors' notices and Application for Payment or Project Application for Payment, to the Architect/Engineer, who will promptly make such inspection. When the Architect/Engineer finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect/Engineer will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their 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 Construction Manager's and Architect/Engineer's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect/Engineer through the Construction Manager (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the County or the County's property might be responsible or encumbered (less amounts withheld by County) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6), if required by the County, 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 County. If a Subcontractor refuses to furnish a release or waiver required by the County, the Contractor may furnish a bond satisfactory to the County to indemnify the County 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 County all money that the County 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 Construction Manager and Architect/Engineer so confirm, the County shall, upon application by the Contractor and certification by the Construction Manager and Architect/Engineer, 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/Engineer through the Construction Manager prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the County 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 County, if permitted by the Contract Documents, after final payment.

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

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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. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

§ 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, a Sub-subcontractor;
- **.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;
- **.4** construction or operations by the County, Separate Contractors, or other Contractors. and
- **.5** the general public.

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

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the County's 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, 10.2.1.3 and 10.2.1.4 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, 10.2.1.3 and 10.2.1.4. 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 County, Construction Manager or Architect/Engineer or anyone directly or indirectly employed by any of them, or by anyone for whose acts any 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 County, Construction Manager and Architect/Engineer.

§ 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, written 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.

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§ 10.3 Hazardous Materials

§ 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 County, Construction Manager and Architect/Engineer in writing of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the County 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 County shall furnish in writing to the Contractor, Construction Manager and Architect/Engineer 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, the Construction Manager and the Architect/Engineer will promptly reply to the County in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the County. If the Contractor, Construction Manager or Architect/Engineer has an objection to a person or entity proposed by the County, the County shall propose another to whom the Contractor, the Construction Manager and the Architect/Engineer 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 County and Contractor. By Change Order, the Contract Time shall be extended appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the County shall indemnify and hold harmless the Contractor, Subcontractors, Construction Manager, Architect/Engineer, their 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 County 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 County 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 County for the cost and expense the County 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 County'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 County shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance

§ 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 County, Construction Manager and Construction Manager's consultants, and the Architect/Engineer and Architect/Engineer's consultants, shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

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§ 11.1.2 Insurance Requirements. The vendor awarded this contract is required to provide a Certificate of Insurance that contains a minimum of the following coverage and limits:

Commercial General Liability - (policy to include premises and operations, products/completed operations and blanket contractual liability- the contractual section of the coverage must cover this agreement and limit applies to a project specific basis)

General Aggregate Limit	$2,000,000.
Products & Completed Operations Aggregate Limit	$2,000,000.
Each Occurrence Limit	$1,000,000.

Automobile Liability - to include owned, non-owned and hired vehicles:

Combined Single Limit	$1,000,000.

Special Insurance Coverage: If any of the following exposures exist from the project/worksite, the appropriate coverage must be specifically identified on the Certificate of Insurance **and** a sub-limit if applicable.

"X, C, U" (Explosion, Collapse, Underground) Coverage

Each occurrence limit	$1,000,000.

Excess Liability - coverage is to be in an umbrella form, any restrictions or limitations in coverage should be specified on the certificate of insurance:

Each Occurrence	$2,000,000.
Aggregate Limit	$2,000,000.

Workers Compensation	Statutory
and Employer's Liability:	
Bodily Injury by Accident	$ 100,000. ea. accident
Bodily Injury by Disease	$ 100,000. ea. employee
Bodily Injury by Disease	$ 500,000. policy limit

Waiver of Subrogation in favor of the County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions applies under all policies.

When it applies, Additional Insured shall read: The County of Bucks, its Board of Commissioners, employees, directors, officers, departments and divisions and [as applicable] the Construction Manager, Architect/Engineer and their employees, directors, and officers shall be included as additional insured on a primary and non-contributory basis with respect to the work performed for this contract: **Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22.**

Cancellation Clause shall read: Should any of the above-described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Certificate Holder - County of Bucks Board of Commissioners, Attn: Office of the Controller, 55 East Court St, Doylestown PA 18901.

§ 11.1.3 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three 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 directly to the County, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the County shall, unless the lapse in coverage arises from an act or omission of the County, have the right to stop the Work or withhold payment for work completed until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 County's Insurance

§ 11.2.1 The County shall be responsible for purchasing and maintaining the County's usual liability insurance.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the County 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

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County shall inform both the Contractor and the Construction Manager, separately and in writing, prior to commencement of the Work. Upon receipt of notice from the County, 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 County fails to procure coverage, the County waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the County would have been covered by the insurance to have been procured by the County. The cost of the insurance shall be charged to the County by a Change Order. If the County does not provide written notice, and the Contractor is damaged by the failure or neglect of the County to purchase or maintain the required insurance, the County shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of County's Required Property Insurance. Within three business days of the date the County becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the County shall provide notice directly to the Contractor, and separately to the Construction Manager, 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 County, 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 County or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the County waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the County 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 County by an appropriate Change Order. The furnishing of notice by the County shall not relieve the County of any contractual obligation to provide required insurance.

§ 11.3 Waiver of Subrogation

§ 11.3.1 The County 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 Construction Manager and Construction Manager's consultants; (3) the Architect/Engineer and Architect/Engineer's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) 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 proceeds of such insurance. The County or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect/Engineer, Architect/Engineer's consultants, other Contractors, 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 County 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 County 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 County, at the County's option, may purchase and maintain insurance that will protect the County against loss of use of the County's property, or the inability to conduct normal operations, due to fire or other causes of loss. The County waives all rights of action against the Contractor, Architect/Engineer, and Construction Manager for loss of use of the County'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 County as fiduciary and made payable to the County 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 County shall pay the Construction Manager, Architect/Engineer and Contractor their just shares of insurance proceeds received by the County, and by appropriate agreements the Construction Manager, Architect/Engineer and Contractor shall make payments to their consultants and Subcontractors in similar manner.

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§ 11.5.2 Prior to settlement of an insured loss, the County 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 from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the County shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the County shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the County does not terminate the Contract for convenience, the County 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 the terms of the proposed settlement or the allocation of the proceeds, the County may proceed to settle the insured loss, and any dispute between the County 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 County may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

§ 11.6 Performance, Payment and Maintenance Bond

§ 11.6.1 The County shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract; payment of obligations arising thereunder and maintenance against defective or inferior material or workmanship as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.6.2 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.

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

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 Construction Manager's or Architect/Engineer's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by either, be uncovered for their examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Construction Manager or Architect/Engineer has not specifically requested to examine prior to its being covered, the Construction Manager or Architect/Engineer 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 Construction Manager or Architect/Engineer 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 Construction Manager's and Architect/Engineer's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

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

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nonconforming Work within a reasonable time during that period after receipt of notice from the County, Construction Manager or Architect/Engineer, the County may correct it in accordance with Section 2.5.

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

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

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

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

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

§ 12.2.6 If the Contractor fails to correct nonconforming Work within a reasonable time, the County may correct it in accordance with Section 2.4. If the Contractor does not proceed with correction of such nonconforming Work within a reasonable time fixed by written notice from the Architect/Engineer issued through the Construction Manager, the County may remove it and store the salvable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage within 10 days after written notice, the County may, upon 10 additional days' written notice, sell such materials and equipment at auction or at private sale, and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Construction Manager's and Architect/Engineer's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contract Sum shall be reduced by the deficiency. If payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the County.

§ 12.2.7 If, in the opinion of the Architect/Engineer and the Construction Manager, the Contractor delays Final Completion of the Work beyond a reasonable time after the Date of Substantial Completion of the Project to such extent that the period between the Date of Substantial Completion of the Project and the end of the guarantee period becomes less than 11 months, the start of the guarantee period shall be the date of the final Project Certificate of Payment in lieu of the Date of Substantial Completion of Project.

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by and construed in accordance with the laws of the Commonwealth of Pennsylvania, without regard to conflicts of law principles and subject only to the jurisdiction of the Bucks County Court of Common Pleas, Bucks County, Pennsylvania.

§ 13.2 Successors and Assigns

§ 13.2.1 The County 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

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an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The County may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the County'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 County, Construction Manager, Architect/Engineer, 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 Interest

Payments due and unpaid under the Contract Documents shall paid at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.5 Steel Products Procurement

If any steel products are required in the performance of this contract or any subcontracts hereunder only steel products, as defined in the Commonwealth of Pennsylvania Act No. 1978-3 (SB No. 1068) shall be used or supplied.

§ 13.6 Prevailing Wage Act

The PA Prevailing Wage Act (Act of 1961, P.L. 987, No. 442) will apply to this contract. See attached for the PA Prevailing Wages assigned to this project by the PA Department of Labor & Industry.

§ 13.7 Discrimination Prohibited

The Contractor shall comply with all Federal, State, County, Borough or Township laws or ordinances in any way pertaining to the work and shall obtain all permits that may be necessary for its performance if required.

a. That in the hiring of employees for the performance of such Agreement, no contractor, sub-contractor, nor any person acting on behalf of such contractor or sub-contractor shall by reason of race, creed or color discriminate against any citizen of the United States who is qualified and able to perform the work to which the employment relates;
b. Nor shall they in any manner discriminate against or intimidate any employees hired for the performance of the work on account of race, creed or color.

§ 13.8 Americans with Disabilities Act

During the terms of this Agreement, the Contractor agrees as follows:

a. Pursuant to federal regulations promulgated under the authority of The Americans with Disabilities Act, 28 C.F.R. Section 35.101 et seq., the Contractor understands and agrees that no individual with a disability shall, on the basis of disability, be excluded from participation in this Agreement or from activities provided for under this Agreement. As a condition of accepting and executing this Agreement, the Contractor agrees to comply with the "General Prohibitions Against Discrimination," 28 C.F.R. Section 35.130, and all other regulations promulgated under Title II of the Americans with Disabilities Act which are applicable to the benefits, services, programs, and activities provided by the County through Agreements with outside contractors.
b. The Contractor shall be responsible for and agrees to indemnify, defend and hold harmless the County from all losses, damages, expenses, claims, demands, suits and actions brought by any party against the County as a result of the Contractor's failure to comply with the provisions of section 13.9.

§ 13.9 Interpretations

a. Where required hereunder to effectuate the intent of the Contract Documents, masculine shall mean neuter or feminine and the singular shall mean the plural.
b. The captions and headings of various Paragraphs in the Contract Documents are for convenience only and are not to be construed as defining or limiting, in any way, the scope or intent of the provisions hereof.

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c. The invalidity of any covenant, restriction, condition, limitation or any other part or provision of the Contract Documents shall not impair or affect in any manner the validity, enforceability or effect of the remainder of the Contract Documents.

d. The parties hereto acknowledge that all of them have participated in the drafting of the Contract Documents and the parties hereto expressly waive the defense of contra proferentum, i.e., that the Contract Documents or any portion of the Contract Documents may be construed against any party as the drafter thereof.

§ 13.10 Pennsylvania Right to Know Act

§ 13.10.1 All proposals/bids and other material submitted becomes the property of the County and may be returned only at the County's option. Information contained in the proposals/bids will not be disclosed during the evaluation process. Under Pennsylvania's "Right to Know" laws public records are required to be open to reasonable inspection and reproduction. All proposal/bid information, including detailed price and cost information, will be held in confidence during the evaluation process and prior to the time a Notice of Intent to Award is issued. Thereafter all proposals/bids will become public information; subject to inspection and reproduction in accordance with the PA Right to Know Law (Act 3 of 2008), unless otherwise exempt under the Act.

§ 13.10.2 Notwithstanding any terms or conditions contained herein, Contractor agrees to comply with all Local, State and Federal laws and regulation. Contractor specifically agrees to produce all documents that may be subject to public disclosure pursuant to the Pennsylvania Open Records Law.

§ 13.10.3 Trade secrets and other proprietary data contained in a proposal may be held confidential if such data meets the definitions of confidential proprietary information and/or trade secrets under Section 102 of the Right to Know Law. Material considered confidential by the offeror must be clearly identified and the offeror must include a brief statement that sets out the reasons for the confidentiality and how this information meets the criteria of Section 102 of the law.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 Because the Construction Manager has not certified or the Architect/Engineer 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, or because the County has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.3 The County has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

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

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon 10 days' notice to the County, Construction Manager and Architect/Engineer, terminate the Contract and recover from the County payment for Work executed.

§ 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 performing portions of the Work because the County has repeatedly failed to fulfill the County's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon 10 additional days' notice to the County, Construction Manager and Architect/Engineer, terminate the Contract and recover from the County as provided in Section 14.1.3.

§ 14.2 Termination by the County for Cause

§ 14.2.1 The County may terminate the Contract if the Contractor

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

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.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

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

.5 is adjudged bankrupt or insolvent, subject to the provision of the Bankruptcy Laws and specifically 11 U.S.C., Paragraph 365;

.6 makes a general assignment for the benefit of creditors;

.7 a trustee of receiver is appointed for Contractor or for any of Contractor's property;

.8 files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws;

.9 disregards the authority of the Architect/Engineer or Construction Manager;

.10 otherwise is guilty of a breach of a provision of the Local Public Contracts Law and all other applicable law or resolution;

.11 abandons the Work;

.12 fails or refuses to perform a material obligation under the Agreement;

.13 fails without cause to make prompt payment duly owing to a Subcontractor, provided that County is current on all of its payment obligations owing to Contractor;

.14 fails to remove any lien or claim of lien filed against the Project by any of its Subcontractors or material suppliers, provided that County has paid the Contractor for the amount sought in such lien by the Subcontractor or material supplier and that County is current on all of its payment obligations owing to Contractor; or

.15 fails to achieve Final Completion within 30 days of the Final Completion Date.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, after consultation with the Construction Manager, and upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, the County may, without prejudice to any other rights or remedies of the County 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 County may deem expedient. Upon written request of the Contractor, the County shall furnish to the Contractor a detailed accounting of the costs incurred by the County in finishing the Work.

§ 14.2.3 When the County 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 Construction Manager's and Architect/Engineer's services and expenses made necessary thereby, and other damages incurred by the County 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 County. The amount to be paid to the Contractor or County, as the case may be, shall, upon application, be certified by the Initial Decision Maker after consultation with the Construction Manager, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the County for Convenience

§ 14.3.1 The County 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 County may determine, including, without limitation, an act of government, such as a declaration of national emergency requiring all Work to be stopped.

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

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of this Contract.

§ 14.4 Termination by the County for Convenience

§ 14.4.1 The County may, at any time, terminate the Contract for the County's convenience and without cause, including, without limitation, an act of government, such as a declaration of national emergency requiring all Work to be stopped.

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

.1 cease operations as directed by the County in the notice;

.2 take actions necessary, or that the County may direct, for the protection and preservation of the Work;

.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;

.4 assign to County, in the manner and to the extent directed by it, all of the right, title and interest of the Contractor under the orders of subcontractors so terminated, in which case the County shall have the right to settle or pay any or all claims arising out of the termination of such orders and subcontractors;

.5 with the approval of the County, settle all outstanding liabilities and all claims arising out of such termination or orders and subcontracts; and

.6 deliver to County, when and as directed by the County, all documents and all property which, if the work had been completed, the Contractor would be required to account for or deliver to the County, and transfer title to such property to the County to the extent not already transferred.

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

ARTICLE 15 CLAIMS AND DISPUTES

(Paragraph deleted)

§ 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 County 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 County to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

(Paragraph deleted)

§ 15.1.2 Time Limits on Claims

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

§ 15.1.3 Notice of Claims

(Paragraphs deleted)

§ 15.1.3.1 Claims by either the County 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 Construction Manager and Architect/Engineer, if the Construction Manager and or Architect/Engineer is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the County 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.

(Paragraphs deleted)

§ 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 County shall continue to make payments in accordance with the Contract Documents.

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§ 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/Engineer will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

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

(Paragraph deleted)

§ 15.1.6 Claims for Additional Time

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

(Paragraph deleted)

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

§ 15.1.7 Waiver of Claims for Consequential Damages. The Contractor and County 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 County 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.

(Paragraph deleted)

§ 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/Engineer 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 filing a cause of action under Section 15.2.6. 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 proceed under Section 15.2.6 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 County.

(Paragraphs deleted)

§ 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.

(Paragraph deleted)

§ 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 County to authorize retention of such persons at the County's expense.

(Paragraphs deleted)

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§ 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.

(Paragraph deleted)

§ 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, the Construction Manager, and the Architect/Engineer, if the Architect/Engineer or Construction Manager 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 compulsory on the parties but subject to Section 15.2.6 if the parties fail to resolve their dispute through the Initial Decision Maker.

(Paragraphs deleted)

§ 15.2.6 Should either party file cause of action arising out of or relating to the Contract, it shall be exclusively litigated in the Court of Common Pleas of Bucks County.

(Paragraph deleted)

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

(Paragraphs deleted)

§ 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.

(Paragraphs deleted)

§ 15.3 Final Decision

(Paragraphs deleted)

§ 15.3.1 To the extent the Contractor pursues a claim or litigation against the County and the County prevails, partially or completely, on any or all of its own claims or defenses to the Contractor's claims, leaving the Contractor with less than 100% recovery, the Contractor will be liable for any and all legal fees, professional fees, costs or expenses of the County, as well as the true cost of any of the County's employees' time, associated with analyzing any claim, pursuing litigation or defending the claim or litigation. Further, to the extent any Contractor makes an excessive number of claims, which excessiveness, shall be determined solely in the discretion of the County, and the County incurs any legal fees, professional fees, expenses, costs (including, but not limited to, employee cost), the Contractor shall be liable for such fees, expenses or costs. In the event of a dispute between the Contractor and the County, to the extent that the County incurs any legal fees, professional fees, or other costs or expenses, the Contractor will be responsible for those amounts, which will be deducted, to the extent available, from any amount due the Contractor. If the amount due the Contractor is not sufficient to cover such cost, the Contractor shall pay the difference to the County within seven days of receipt of the County's invoice for such legal fees, professional fees, or other cost or expenses.

(Paragraph deleted)

§ 15.3.2 The Contractor and Contractor's Surety shall be liable for and shall pay the County the cost of expenses incurred by the County resulting from the Contractor's delay in completing the Contract within the contract time, as liquidated damages, and not as a penalty, in the amount as defined in the Agreement, for each calendar day of delay until the work is substantially complete at each phase of construction, subject to adjustments of the contract time as provided in the Contract Documents. In the event the Contractor or Surety litigates the validity of this provision or the assertion of liquidated damages, the Contractor and Surety, jointly and severally, shall also be liable for legal fees, professional fees, costs, other expenses and/or damages. This liquidated damages provision applies to each phase of construction. The County's right to receive liquidated damages shall be in addition to all other rights and remedies available to the County at law or in equity. The County shall have the right to deduct the total amount of liquidated damages for which the Contractor may be liable under this Section 15.3.2 from any payments then or thereafter due the Contractor.

(Paragraphs deleted)

(Paragraphs deleted)

(Paragraphs deleted)

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00 73 43 - PENNSYLVANIA PREVAILING WAGE ACT

PART 1 – GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to comply with the Pennsylvania Prevailing Wage Act.

1.2 GENERAL REQUIREMENTS

A. The provisions of the Pennsylvania Prevailing Wage Act approved August 15, 1961 (P.L. 987) (43 P.S. § 165-14), and the Regulations issued pursuant thereto (attached hereto) are hereby incorporated in and made part of the General Requirements of the Project. The Secretary of the Pennsylvania Department of Labor and Industry has predetermined the minimum wage rates, including contribution for employee benefits, which shall be paid to the workmen employed in the performance of this Project.

B. The following provisions shall apply:

1. These provisions shall apply to all work performed on the Project by the Contractor, and to all work performed on the Project by all Subcontractors.
2. The Contractor shall insert in each of his subcontracts all of the stipulations contained in these required provisions and any other stipulations as may be required.
3. Workmen may not be employed on the work except in accordance with classifications set forth in the decision of the Secretary. In the event that additional or different classifications are necessary, the procedure set forth in Section 7 of the Regulations shall be followed.
4. Workmen employed or working on the Project shall be paid unconditionally, regardless of whether any contractual relationship exists or the nature of any contractual relationship which may be alleged to exist between any Contractor, Subcontractor and workmen, not less than once a week without deduction or rebate, on any account, either directly or indirectly except authorized deductions, the full amounts due at the time of payment, computed at the rates applicable to the time worked in the appropriate classification. Nothing in the Contract, the Act, or the Regulations shall prohibit the payment of more than the general prevailing minimum wage rates as determined by the Secretary to any workmen on public work.
5. The Contractor and each Subcontractor shall post for the entire construction period the wage determination decisions of the secretary, including the effective date of any changes thereof, in a prominent and easily accessible place at the project site and at such place used by them to pay workmen their wages. The posted notice must indicate:

    a. Name of Project.
    b. Name of public body the project is being constructed for.
    c. The crafts and classifications of workmen listed in the Secretary's general prevailing minimum wage rate determination for the project.
    d. The general prevailing minimum wage rates determined for each craft and classification and the effective date of any changes.
    e. A statement advising workmen that if they have been paid less than the general prevailing minimum wage rate for their job classification or that the Contractor and/or Subcontractor are not complying with the Act or these Regulations in any manner

whatsoever, they may file a protest in writing with the Secretary of Labor and Industry within three months of the date of the occurrence, objecting to the payment to any Contractor to the extent of the amount or amounts due or to become due to when as wages for work performed on the public work project. Any workmen paid less than the rate specified in the contract shall have a civil right of action for the difference between the wage paid and the wage stipulated in the contract, which right must be exercised within six months from the occurrence of the event creating such right.

6. The Contractor and all Subcontractors shall keep an accurate record showing the name, craft and/or classification, number of hours worked per day, and the actual hourly rate of wage paid, including employee benefits, to each workman employed by him in connection with the Work of this project. The record must include any deductions from each workman. The record shall be preserved for two years from the date of payment and shall be open, at all reasonable hours, to the inspection of the public body awarding the contract, and to the Secretary or his duly authorized representative.
7. Apprentices shall be limited to such numbers as shall be in accordance with a bona fide apprenticeship program registered with and approved by the Pennsylvania Apprenticeship and Training Council and only apprentices whose training and employment are in full compliance with the provisions of the Apprenticeship and Training Act approved July 14, 1961 (Act No. 304) and the Rules and Regulations issued pursuant thereto shall be employed on the project. Any workman using the tools of a craft who does not qualify as an apprentice within the provisions of this subsection shall be paid the rate predetermined for journeymen in that particular craft and/or classification.
8. Wages shall be paid without any deductions except authorized deductions. Employers not party to a contract requiring contributions for employee benefits which the Secretary has determined to be included in the general prevailing minimum wage rate shall pay the monetary equivalent thereof directly to the workman.
9. The Contractor shall be liable and responsible for any wage increases during the duration of the contract as specified in the Milestone Schedule in the specifications. No increases in wages during the period of the contract schedule will be billable to the Owner.

1.3 LUMP SUM PAYMENTS

A. Payment of compensation to workmen for work performed on the project on a lump sum basis, or a price certain for the completion of a certain amount of work, or the production of a certain result shall be deemed a violation of the Act and these Regulations, regardless of the average hourly earnings resulting therefrom.

1.4 FILING REQUIREMENTS

A. Each Contractor and each Subcontractor shall file a statement each week and a final statement at the conclusion of the project with the Contracting Party, under oath, and in a form satisfactory to the Secretary, certifying that all workmen have been paid wages in strict conformity with the provisions of the Contract as prescribed by this Section 3 of these Regulations, or if any wages remain unpaid to set forth the amount of wages due and owing to each workman respectively.

1.5 PREVAILING MINIMUM WAGE PREDETERMINATION

A. The Prevailing Minimum Wage Determination for this Project shall be as identified by the Governing Authorities for this project. The Contractor is responsible for the Prevailing Wage Rates and increases for the duration of this project as specified in the Milestone Schedule of the specifications.

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project Name:	Restoration & Renovation of the Farmhouse for the African American Museum of Bucks County
Awarding Agency:	County of Bucks
Contract Award Date:	9/7/2022
Serial Number:	22-04713
Project Classification:	Building
Determination Date:	5/27/2022
Assigned Field Office:	Philadelphia
Field Office Phone Number:	(215)560-1858
Toll Free Phone Number:	
Project County:	Bucks County

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Asbestos & Insulation Workers	5/29/2017		$47.30	$34.85	$82.15
Asbestos & Insulation Workers	5/1/2018		$49.30	$35.85	$85.15
Asbestos & Insulation Workers	5/1/2019		$51.20	$36.95	$88.15
Asbestos & Insulation Workers	6/1/2020		$54.20	$36.95	$91.15
Asbestos & Insulation Workers	5/1/2021		$54.35	$39.95	$94.30
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2017		$28.52	$18.22	$46.74
Boilermaker (Commercial, Institutional, and Minor Repair Work)	3/1/2018		$29.52	$18.22	$47.74
Boilermaker (Commercial, Institutional, and Minor Repair Work)	1/1/2019		$29.26	$18.48	$47.74
Boilermakers	1/1/2017		$44.26	$33.36	$77.62
Boilermakers	1/1/2018		$46.26	$33.36	$79.62
Boilermakers	3/1/2018		$45.89	$33.73	$79.62
Boilermakers	1/1/2019		$45.51	$34.11	$79.62
Boilermakers	8/1/2019		$47.21	$34.11	$81.32
Boilermakers	1/1/2021		$49.32	$34.90	$84.22
Boilermakers	1/1/2022		$50.17	$35.30	$85.47
Bricklayer	5/1/2017		$40.98	$26.78	$67.76
Bricklayer	5/1/2018		$43.73	$26.78	$70.51
Bricklayer	5/1/2019		$46.48	$26.78	$73.26
Bricklayer	5/1/2020		$44.45	$30.31	$74.76
Bricklayer	5/1/2021		$45.45	$30.61	$76.06
Bricklayer	5/1/2022		$46.45	$31.06	$77.51
Carpenter - Chief of Party (Surveying & Layout)	5/1/2017		$45.25	$27.59	$72.84
Carpenter - Chief of Party (Surveying & Layout)	5/1/2018	4/30/2019	$45.83	$27.59	$73.42
Carpenter - Chief of Party (Surveying & Layout)	5/1/2019	4/30/2020	$46.54	$27.59	$74.13
Carpenter - Chief of Party (Surveying & Layout)	5/1/2020		$47.73	$27.59	$75.32
Carpenter - Chief of Party (Surveying & Layout)	5/1/2021		$47.47	$28.71	$76.18
Carpenter - Instrument Person (Surveying & Layout)	5/1/2017		$39.35	$27.59	$66.94
Carpenter - Instrument Person (Surveying & Layout)	5/1/2018	4/30/2019	$39.85	$27.59	$67.44
Carpenter - Instrument Person (Surveying & Layout)	5/1/2019	4/30/2020	$40.47	$27.59	$68.06
Carpenter - Instrument Person (Surveying & Layout)	5/1/2020		$41.50	$27.59	$69.09
Carpenter - Instrument Person (Surveying & Layout)	5/1/2021		$41.28	$28.71	$69.99
Carpenter - Rodman (Surveying & Layout)	5/1/2017		$19.68	$19.64	$39.32
Carpenter - Rodman (Surveying & Layout)	5/1/2018	4/30/2019	$19.93	$19.49	$39.42
Carpenter - Rodman (Surveying & Layout)	5/1/2019	4/30/2020	$20.24	$19.69	$39.93
Carpenter - Rodman (Surveying & Layout)	5/1/2020		$20.75	$19.49	$40.24
Carpenter - Rodman (Surveying & Layout)	5/1/2021		$20.64	$20.31	$40.95
Carpenters	5/1/2017		$39.35	$27.59	$66.94
Carpenters	5/1/2018	4/30/2019	$39.85	$27.59	$67.44
Carpenters	5/1/2019	4/30/2020	$40.87	$27.59	$68.46
Carpenters	5/1/2020		$41.90	$27.59	$69.49
Carpenters	5/1/2021		$41.28	$28.71	$69.99
Carpenters	5/1/2022		$42.53	$28.71	$71.24

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Cement Finishers & Plasterers	5/1/2022		$38.57	$32.39	$70.96
Cement Masons	5/1/2017		$36.45	$31.76	$68.21
Cement Masons	5/1/2018		$37.50	$32.26	$69.76
Cement Masons	5/1/2019		$38.50	$32.81	$71.31
Cement Masons	5/1/2020		$39.45	$33.46	$72.91
Cement Masons	5/1/2021		$40.70	$33.46	$74.16
Cement Masons	5/1/2022		$42.05	$33.46	$75.51
DockBuilder/ Divers (Building Heavy & Highway)	5/1/2020		$52.44	$37.27	$89.71
DockBuilder/Pile Drivers (Building, Heavy & Highway)	5/1/2018		$43.45	$34.47	$77.92
DockBuilder/Pile Drivers (Building, Heavy & Highway)	5/1/2020		$43.70	$37.27	$80.97
DockBuilder/Pile Drivers/ Diver Tender(Building Heavy & Highway)	5/1/2020		$43.70	$37.27	$80.97
Dockbuilder/Piledriver (Building, Heavy, Highway)	11/1/2017		$43.45	$33.22	$76.67
Dockbuilder/Piledriver (Building, Heavy, Highway)	5/1/2018		$44.70	$33.22	$77.92
Drapery Installers	5/1/2009		$31.09	$21.34	$52.43
Drywall Finisher	5/1/2017		$37.11	$26.75	$63.86
Drywall Finisher	5/1/2018		$39.27	$27.49	$66.76
Drywall Finisher	5/1/2019		$37.75	$28.11	$65.86
Drywall Finisher	5/1/2020		$38.27	$28.59	$66.86
Drywall Finisher	5/1/2022		$38.93	$29.96	$68.89
Electricians	5/1/2016		$49.18	$31.57	$80.75
Electricians	10/1/2017	9/2/2018	$49.79	$32.08	$81.87
Electricians	9/3/2018		$50.14	$31.73	$81.87
Electricians	1/1/2019	3/31/2019	$50.20	$31.67	$81.87
Electricians	4/1/2019	7/5/2020	$51.27	$32.59	$83.86
Electricians	7/6/2020		$51.71	$34.16	$85.87
Electricians	10/4/2021		$53.73	$34.13	$87.86
Elevator Constructor	1/1/2016		$52.79	$30.29	$83.08
Elevator Constructor	1/1/2018		$55.76	$33.05	$88.81
Elevator Constructor	1/1/2020		$59.44	$35.25	$94.69
Elevator Constructor	1/1/2021		$61.43	$36.36	$97.79
Floor Coverer	5/1/2019		$44.37	$28.44	$72.81
Floor Coverer	5/1/2020		$46.01	$28.44	$74.45
Floor Coverer	5/1/2021		$45.74	$29.21	$74.95
Floor Layer	5/1/2017		$42.51	$27.91	$70.42
Floor Layer	5/1/2018		$43.11	$28.09	$71.20
Glazier	5/1/2017		$41.30	$30.80	$72.10
Glazier	5/1/2018		$43.32	$32.33	$75.65
Glazier	5/1/2019		$43.87	$33.38	$77.25
Glazier	5/1/2020		$44.92	$33.63	$78.55
Glazier	5/1/2021		$45.67	$34.38	$80.05
Glazier	5/1/2022		$46.09	$35.61	$81.70
Interior Finish	5/1/2019		$30.20	$25.80	$56.00
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2017		$47.30	$32.91	$80.21

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2018		$51.46	$30.60	$82.06
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2019		$49.30	$34.41	$83.71
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	1/1/2020		$49.80	$34.41	$84.21
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2020		$50.80	$34.91	$85.71
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2021		$47.70	$39.51	$87.21
Iron Workers (Riggers)	7/1/2017		$39.83	$27.92	$67.75
Ironworker (Rodman)	1/1/2017		$46.20	$31.26	$77.46
Ironworker (Rodman)	7/1/2017		$42.56	$29.30	$71.86
Ironworker (Rodman)	7/1/2018		$42.88	$30.60	$73.48
Ironworker (Rodman)	7/1/2019		$43.88	$30.85	$74.73
Ironworker (Rodman)	7/1/2020		$44.82	$31.60	$76.42
Laborers (Class 01 - General)	5/1/2020		$32.05	$25.25	$57.30
Laborers (Class 01 - See notes)	5/1/2017		$28.65	$24.95	$53.60
Laborers (Class 01 - See notes)	5/1/2019		$30.20	$25.80	$56.00
Laborers (Class 02 - See notes)	5/1/2017		$30.85	$25.65	$56.50
Laborers (Class 02 - See notes)	5/1/2019		$33.15	$26.50	$59.65
Laborers (Class 02 - see notes)	5/1/2020		$35.15	$26.15	$61.30
Laborers (Class 03 - See notes)	5/1/2017		$28.92	$25.18	$54.10
Laborers (Class 03 - See notes)	5/1/2019		$30.52	$25.98	$56.50
Laborers (Class 03 - See notes)	5/1/2020		$32.47	$25.43	$57.90
Laborers (Class 04 - See notes)	5/1/2017		$28.95	$24.95	$53.90
Laborers (Class 04 - See notes)	5/1/2019		$30.52	$25.98	$56.50
Laborers (Class 04 - See notes)	5/1/2020		$32.47	$25.43	$57.90
Laborers (Class 05 - See notes)	5/1/2017		$28.65	$24.95	$53.60
Laborers (Class 05 - See notes)	5/1/2019		$30.20	$25.80	$56.00
Laborers (Class 05 - See notes)	5/1/2020		$32.05	$25.25	$57.30
Landscape Laborer	5/1/2017		$22.71	$23.08	$45.79
Landscape Laborer	5/1/2019		$24.64	$23.68	$48.32
Landscape Laborer	5/1/2020		$26.55	$23.13	$49.68
Marble Finisher	5/1/2017		$35.55	$24.17	$59.72
Marble Finisher	5/1/2018		$37.55	$24.17	$61.72
Marble Finisher	5/1/2019		$39.75	$24.17	$63.92
Marble Finisher	5/1/2020		$37.57	$27.65	$65.22
Marble Finisher	5/1/2022		$38.27	$29.15	$67.42
Marble Mason	5/1/2017		$40.36	$26.99	$67.35
Marble Mason	5/1/2018		$43.11	$26.99	$70.10
Marble Mason	5/1/2019		$45.86	$26.99	$72.85
Marble Mason	5/1/2020		$44.25	$30.10	$74.35
Marble Mason	5/1/2022		$45.90	$31.20	$77.10
Mason Tender, Cement	5/1/2019		$30.52	$25.98	$56.50
Millwright	7/1/2017		$41.35	$32.24	$73.59

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Millwright	5/1/2018		$43.33	$32.96	$76.29
Millwright	5/1/2019		$45.50	$33.29	$78.79
Millwright	6/8/2020		$46.80	$33.19	$79.99
Millwright	5/1/2021		$48.60	$33.19	$81.79
Millwright	5/1/2022		$50.60	$33.19	$83.79
Operators (Building, Class 01 - See Notes)	5/1/2017		$44.87	$28.14	$73.01
Operators (Building, Class 01 - See Notes)	5/1/2018		$46.41	$28.60	$75.01
Operators (Building, Class 01 - See Notes)	5/1/2019		$46.41	$30.60	$77.01
Operators (Building, Class 01 - See Notes)	5/1/2020		$47.96	$31.05	$79.01
Operators (Building, Class 01 - See Notes)	5/1/2021		$49.50	$31.51	$81.01
Operators (Building, Class 01A - See Notes)	5/1/2017		$47.86	$29.03	$76.89
Operators (Building, Class 01A - See Notes)	5/1/2018		$49.41	$29.49	$78.90
Operators (Building, Class 01A - See Notes)	5/1/2019		$49.41	$31.49	$80.90
Operators (Building, Class 01A - See Notes)	5/1/2020		$50.96	$31.94	$82.90
Operators (Building, Class 01A - See Notes)	5/1/2021		$52.51	$32.39	$84.90
Operators (Building, Class 02 - See Notes)	5/1/2017		$44.62	$28.07	$72.69
Operators (Building, Class 02 - See Notes)	5/1/2018		$46.16	$28.53	$74.69
Operators (Building, Class 02 - See Notes)	5/1/2019		$46.16	$30.53	$76.69
Operators (Building, Class 02 - See Notes)	5/1/2020		$47.71	$30.98	$78.69
Operators (Building, Class 02 - See Notes)	5/1/2021		$49.25	$31.44	$80.69
Operators (Building, Class 02A - See Notes)	5/1/2017		$47.61	$28.97	$76.58
Operators (Building, Class 02A - See Notes)	5/1/2018		$49.16	$29.42	$78.58
Operators (Building, Class 02A - See Notes)	5/1/2019		$49.17	$31.41	$80.58
Operators (Building, Class 02A - See Notes)	5/1/2020		$50.71	$31.87	$82.58
Operators (Building, Class 02A - See Notes)	5/1/2021		$52.26	$32.32	$84.58
Operators (Building, Class 03 - See Notes)	5/1/2017		$40.53	$26.87	$67.40
Operators (Building, Class 03 - See Notes)	5/1/2018		$42.07	$27.33	$69.40
Operators (Building, Class 03 - See Notes)	5/1/2019		$42.08	$29.32	$71.40
Operators (Building, Class 03 - See Notes)	5/1/2020		$43.62	$29.78	$73.40
Operators (Building, Class 03 - See Notes)	5/1/2021		$45.16	$30.24	$75.40
Operators (Building, Class 04 - See Notes)	5/1/2017		$40.24	$26.78	$67.02
Operators (Building, Class 04 - See Notes)	5/1/2018		$41.78	$27.22	$69.00
Operators (Building, Class 04 - See Notes)	5/1/2019		$41.78	$29.23	$71.01
Operators (Building, Class 04 - See Notes)	5/1/2020		$43.32	$29.69	$73.01
Operators (Building, Class 04 - See Notes)	5/1/2021		$44.87	$30.14	$75.01
Operators (Building, Class 05 - See Notes)	5/1/2017		$38.51	$26.27	$64.78
Operators (Building, Class 05 - See Notes)	5/1/2018		$40.05	$26.73	$66.78
Operators (Building, Class 05 - See Notes)	5/1/2019		$40.06	$28.72	$68.78
Operators (Building, Class 05 - See Notes)	5/1/2020		$41.60	$29.18	$70.78
Operators (Building, Class 05 - See Notes)	5/1/2021		$43.14	$29.64	$72.78
Operators (Building, Class 06 - See Notes)	5/1/2017		$37.52	$25.98	$63.50
Operators (Building, Class 06 - See Notes)	5/1/2018		$39.07	$26.43	$65.50
Operators (Building, Class 06 - See Notes)	5/1/2019		$39.07	$28.43	$67.50
Operators (Building, Class 06 - See Notes)	5/1/2020		$40.61	$28.89	$69.50

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Building, Class 06 - See Notes)	5/1/2021		$42.16	$29.34	$71.50
Operators (Building, Class 07A- See Notes)	5/1/2017		$54.14	$32.47	$86.61
Operators (Building, Class 07A- See Notes)	5/1/2018		$55.99	$33.02	$89.01
Operators (Building, Class 07A- See Notes)	5/1/2019		$56.30	$35.11	$91.41
Operators (Building, Class 07A- See Notes)	5/1/2020		$58.16	$35.65	$93.81
Operators (Building, Class 07A- See Notes)	5/1/2021		$60.00	$36.21	$96.21
Operators (Building, Class 07B- See Notes)	5/1/2017		$53.84	$32.40	$86.24
Operators (Building, Class 07B- See Notes)	5/1/2018		$55.70	$32.92	$88.62
Operators (Building, Class 07B- See Notes)	5/1/2019		$56.00	$35.03	$91.03
Operators (Building, Class 07B- See Notes)	5/1/2020		$57.86	$35.57	$93.43
Operators (Building, Class 07B- See Notes)	5/1/2021		$59.72	$36.11	$95.83
Painters Class 1 (see notes)	5/1/2021		$41.24	$30.29	$71.53
Painters Class 1 (see notes)	2/1/2022		$48.62	$30.29	$78.91
Painters Class 2 (see notes)	2/1/2021		$47.56	$29.35	$76.91
Painters Class 2 (see notes)	2/1/2022		$59.58	$30.33	$89.91
Painters Class 4 (see notes)	5/1/2021		$41.62	$30.29	$71.91
Painters Class 4 (see notes)	5/1/2022		$41.77	$31.61	$73.38
Piledrivers (Building)	5/1/2022		$57.16	$37.99	$95.15
Piledrivers (Building)	10/31/2022		$58.66	$37.99	$96.65
Piledrivers (Building)	5/1/2023		$63.10	$37.99	$101.09
Piledrivers (Building)	5/1/2024		$66.25	$37.99	$104.24
Piledrivers (Building)	5/1/2025		$69.04	$37.99	$107.03
Piledrivers (Building)	5/1/2026		$71.23	$37.99	$109.22
Piledrivers	5/1/2021		$43.73	$37.99	$81.72
Piledrivers	5/1/2022		$45.73	$37.99	$83.72
Piledrivers	10/31/2022		$47.23	$37.99	$85.22
Piledrivers	5/1/2023		$50.48	$37.99	$88.47
Piledrivers	5/1/2024		$52.98	$37.99	$90.97
Piledrivers	5/1/2025		$55.23	$37.99	$93.22
Piledrivers	5/1/2026		$56.98	$37.99	$94.97
Plasterers	5/1/2017		$37.42	$28.83	$66.25
Plasterers	5/1/2018		$37.42	$30.04	$67.46
Plasterers	5/1/2019		$37.72	$30.74	$68.46
Plasterers	5/1/2020		$38.12	$31.34	$69.46
Plasterers	5/1/2021		$38.37	$31.84	$70.21
plumber	5/1/2018		$53.45	$33.54	$86.99
plumber	5/1/2019		$55.45	$34.54	$89.99
plumber	8/1/2020		$57.33	$35.66	$92.99
plumber	5/1/2021		$59.83	$36.16	$95.99
plumber	5/1/2022		$62.73	$36.61	$99.34
Pointers, Caulkers, Cleaners	5/1/2017		$42.26	$25.69	$67.95
Pointers, Caulkers, Cleaners	5/1/2018		$45.01	$25.69	$70.70
Pointers, Caulkers, Cleaners	5/1/2019		$47.76	$25.69	$73.45
Pointers, Caulkers, Cleaners	5/1/2020		$45.75	$29.20	$74.95

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Pointers, Caulkers, Cleaners	5/1/2021		$46.75	$29.50	$76.25
Pointers, Caulkers, Cleaners	5/1/2022		$47.64	$30.06	$77.70
Roofers (Composition)	5/1/2017		$36.15	$30.22	$66.37
Roofers (Composition)	5/1/2018		$37.15	$31.27	$68.42
Roofers (Composition)	5/1/2019		$38.35	$31.80	$70.15
Roofers (Composition)	5/1/2020		$39.50	$32.30	$71.80
Roofers (Composition)	5/1/2021		$40.33	$33.12	$73.45
Roofers (Composition)	5/1/2022		$41.48	$33.87	$75.35
Roofers (Shingle)	5/1/2016		$25.70	$19.17	$44.87
Roofers (Shingle)	5/1/2019		$28.50	$20.87	$49.37
Roofers (Shingle)	5/1/2020		$29.50	$21.25	$50.75
Roofers (Shingle)	5/1/2021		$30.50	$21.55	$52.05
Roofers (Slate & Tile)	5/1/2016		$28.70	$19.17	$47.87
Roofers (Slate & Tile)	5/1/2018		$30.50	$20.37	$50.87
Roofers (Slate & Tile)	5/1/2019		$31.50	$20.87	$52.37
Roofers (Slate & Tile)	5/1/2020		$32.50	$21.25	$53.75
Roofers (Slate & Tile)	5/1/2021		$33.50	$21.55	$55.05
Sheet Metal Workers	5/1/2017		$46.42	$39.51	$85.93
Sheet Metal Workers	5/1/2018		$47.58	$41.60	$89.18
Sheet Metal Workers	5/1/2019		$49.79	$42.89	$92.68
Sheet Metal Workers	5/1/2020		$52.04	$44.19	$96.23
Sheet Metal Workers	5/1/2021		$53.84	$45.94	$99.78
Sheet Metal Workers	5/1/2022		$55.75	$47.28	$103.03
Sign Makers and Hangars	7/17/2021		$29.49	$23.90	$53.39
Sprinklerfitters	4/1/2017		$37.40	$21.74	$59.14
Sprinklerfitters	4/1/2018		$38.80	$22.74	$61.54
Sprinklerfitters	5/1/2019		$57.20	$28.32	$85.52
Sprinklerfitters	5/1/2020		$59.10	$29.22	$88.32
Sprinklerfitters	5/1/2021		$60.83	$30.34	$91.17
Sprinklerfitters	5/1/2022		$62.79	$31.43	$94.22
Steamfitters	5/1/2017		$54.64	$32.53	$87.17
Steamfitters	5/1/2018		$56.37	$34.39	$90.76
Steamfitters	5/1/2019		$58.17	$35.99	$94.16
Steamfitters	5/1/2020		$60.47	$37.24	$97.71
Steamfitters	5/1/2021		$60.47	$40.89	$101.36
Steamfitters	5/1/2022		$64.57	$40.59	$105.16
Stone Masons	5/1/2017		$40.36	$26.99	$67.35
Stone Masons	5/1/2018		$43.11	$26.99	$70.10
Stone Masons	5/1/2019		$45.86	$26.99	$72.85
Stone Masons	5/1/2020		$44.25	$30.10	$74.35
Stone Masons	5/1/2021		$44.90	$30.75	$75.65
Stone Masons	5/1/2022		$45.90	$31.20	$77.10
Terrazzo Finisher	5/1/2017		$39.06	$22.73	$61.79
Terrazzo Finisher	5/1/2018		$41.31	$22.73	$64.04

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Terrazzo Finisher	5/1/2019		$43.61	$22.73	$66.34
Terrazzo Finisher	5/1/2020		$41.46	$26.37	$67.83
Terrazzo Finisher	5/1/2022		$42.44	$27.71	$70.15
Terrazzo Grinder	5/1/2017		$39.33	$22.73	$62.06
Terrazzo Grinder	5/1/2018		$41.58	$22.73	$64.31
Terrazzo Grinder	5/1/2019		$43.98	$22.73	$66.71
Terrazzo Grinder	5/1/2020		$41.73	$26.37	$68.10
Terrazzo Grinder	5/1/2022		$42.71	$27.71	$70.42
Terrazzo Mechanics	5/1/2017		$43.71	$24.81	$68.52
Terrazzo Mechanics	5/1/2018		$46.46	$24.81	$71.27
Terrazzo Mechanics	5/1/2019		$49.21	$24.81	$74.02
Terrazzo Mechanics	5/1/2020		$47.51	$28.01	$75.52
Terrazzo Mechanics	5/1/2021		$48.01	$28.81	$76.82
Terrazzo Mechanics	5/1/2022		$48.81	$29.46	$78.27
Tile Finisher	5/1/2017		$35.55	$24.17	$59.72
Tile Finisher	5/1/2018		$37.55	$24.17	$61.72
Tile Finisher	5/1/2019		$39.75	$24.17	$63.92
Tile Finisher	5/1/2020		$37.57	$27.65	$65.22
Tile Finisher	5/1/2022		$38.27	$29.15	$67.42
Tile Setter	5/1/2017		$43.71	$24.81	$68.52
Tile Setter	5/1/2018		$46.46	$24.81	$71.27
Tile Setter	5/1/2019		$49.21	$24.81	$74.02
Tile Setter	5/1/2020		$47.51	$28.01	$75.52
Tile Setter	5/1/2022		$48.81	$29.46	$78.27
Truckdriver class 1(see notes)	5/1/2017		$30.46	$17.96	$48.42
Truckdriver class 1(see notes)	5/1/2018		$31.93	$17.96	$49.89
Truckdriver class 1(see notes)	5/1/2019		$32.21	$19.19	$51.40
Truckdriver class 1(see notes)	5/1/2020		$34.93	$17.96	$52.89
Truckdriver class 1(see notes)	5/1/2021		$36.48	$17.96	$54.44
Truckdriver class 2 (see notes)	5/1/2017		$30.56	$17.96	$48.52
Truckdriver class 2 (see notes)	5/1/2018		$32.03	$17.96	$49.99
Truckdriver class 2 (see notes)	5/1/2019		$32.31	$19.19	$51.50
Truckdriver class 2 (see notes)	5/1/2020		$35.03	$17.96	$52.99
Truckdriver class 2 (see notes)	5/1/2021		$36.58	$17.96	$54.54
Truckdriver class 3 (see notes)	5/1/2017		$30.81	$17.96	$48.77
Truckdriver class 3 (see notes)	5/1/2018		$32.28	$17.96	$50.24
Truckdriver class 3 (see notes)	5/1/2019		$32.56	$19.19	$51.75
Truckdriver class 3 (see notes)	5/1/2020		$35.28	$17.96	$53.24
Truckdriver class 3 (see notes)	5/1/2021		$36.83	$17.96	$54.79
Window Film / Tint Installer	6/1/2019		$24.52	$12.08	$36.60

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter - Chief of Party (Surveying & Layout)	5/1/2017		$51.42	$27.39	$78.81
Carpenter - Chief of Party (Surveying & Layout)	5/1/2018	4/30/2019	$53.20	$27.69	$80.89
Carpenter - Chief of Party (Surveying & Layout)	5/1/2019	4/30/2020	$55.38	$27.69	$83.07
Carpenter - Chief of Party (Surveying & Layout)	5/1/2020	4/30/2021	$57.63	$27.69	$85.32
Carpenter - Chief of Party (Surveying & Layout)	5/1/2021		$59.93	$27.69	$87.62
Carpenter - Chief of Party (Surveying & Layout)	5/1/2022		$60.71	$29.06	$89.77
Carpenter - Chief of Party (Surveying & Layout)	5/1/2023		$63.24	$29.06	$92.30
Carpenter - Chief of Party (Surveying & Layout)	5/1/2024		$65.19	$29.06	$94.25
Carpenter - Chief of Party (Surveying & Layout)	5/1/2025		$67.15	$29.06	$96.21
Carpenter - Chief of Party (Surveying & Layout)	5/1/2026		$69.10	$29.06	$98.16
Carpenter - Instrument Person (Surveying & Layout)	5/1/2017		$44.71	$27.39	$72.10
Carpenter - Instrument Person (Surveying & Layout)	5/1/2018	4/30/2019	$46.26	$27.69	$73.95
Carpenter - Instrument Person (Surveying & Layout)	5/1/2019	4/30/2020	$48.16	$27.69	$75.85
Carpenter - Instrument Person (Surveying & Layout)	5/1/2020	4/30/2021	$50.11	$27.69	$77.80
Carpenter - Instrument Person (Surveying & Layout)	5/1/2021		$52.11	$27.69	$79.80
Carpenter - Instrument Person (Surveying & Layout)	5/1/2022		$52.79	$29.06	$81.85
Carpenter - Instrument Person (Surveying & Layout)	5/1/2023		$54.99	$29.06	$84.05
Carpenter - Instrument Person (Surveying & Layout)	5/1/2024		$56.69	$29.06	$85.75
Carpenter - Instrument Person (Surveying & Layout)	5/1/2025		$58.39	$29.06	$87.45
Carpenter - Instrument Person (Surveying & Layout)	5/1/2026		$60.09	$29.06	$89.15
Carpenter - Rodman (Surveying & Layout)	5/1/2017		$35.77	$21.19	$56.96
Carpenter - Rodman (Surveying & Layout)	5/1/2018	4/30/2019	$37.01	$21.34	$58.35
Carpenter - Rodman (Surveying & Layout)	5/1/2019	4/30/2020	$38.53	$21.34	$59.87
Carpenter - Rodman (Surveying & Layout)	5/1/2020	4/30/2021	$40.09	$21.34	$61.43
Carpenter - Rodman (Surveying & Layout)	5/1/2021		$41.69	$21.34	$63.03
Carpenter - Rodman (Surveying & Layout)	5/1/2022		$42.23	$22.41	$64.64
Carpenter - Rodman (Surveying & Layout)	5/1/2023		$43.99	$22.41	$66.40
Carpenter - Rodman (Surveying & Layout)	5/1/2024		$45.35	$22.41	$67.76
Carpenter - Rodman (Surveying & Layout)	5/1/2025		$46.71	$22.41	$69.12
Carpenter - Rodman (Surveying & Layout)	5/1/2026		$48.07	$22.41	$70.48
Carpenter	5/1/2018	4/30/2019	$46.26	$27.69	$73.95
Carpenter	5/1/2019	4/30/2020	$47.81	$28.04	$75.85
Carpenter	5/1/2020		$49.46	$28.34	$77.80
Carpenter	5/1/2021		$51.76	$28.04	$79.80
Carpenter	5/1/2022		$52.79	$29.06	$81.85
Carpenter	5/1/2023		$54.99	$29.06	$84.05
Carpenter	5/1/2024		$56.69	$29.06	$85.75
Carpenter	5/1/2025		$58.49	$29.06	$87.55
Carpenter	5/1/2026		$60.19	$29.06	$89.25
Cement Masons	5/1/2017		$34.45	$31.51	$65.96
Cement Masons	5/1/2018		$35.65	$32.01	$67.66
Cement Masons	5/1/2019		$37.90	$31.51	$69.41
Cement Masons	5/1/2020		$37.95	$33.26	$71.21
Cement Masons	5/1/2021		$39.65	$33.41	$73.06

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
DockBuilder/ Divers (Building Heavy & Highway)	5/1/2020		$52.44	$37.27	$89.71
DockBuilder/Pile Drivers/ Diver Tender(Building Heavy & Highway)	5/1/2020		$43.70	$37.27	$80.97
Electric Lineman	5/29/2017		$52.60	$26.37	$78.97
Electric Lineman	5/28/2018		$53.64	$27.45	$81.09
Electric Lineman	5/27/2019		$54.66	$28.56	$83.22
Electric Lineman	6/1/2020		$55.96	$29.76	$85.72
Electric Lineman	5/31/2021		$57.93	$30.22	$88.15
Electric Lineman	5/30/2022		$59.17	$31.48	$90.65
Electric Lineman	5/29/2023		$60.48	$32.77	$93.25
Electric Lineman	6/3/2024		$62.07	$33.96	$96.03
Electricians	6/1/2022		$44.46	$23.06	$67.52
Electricians	6/1/2023		$46.49	$23.06	$69.55
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2016		$46.20	$31.26	$77.46
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	1/1/2017		$46.20	$31.26	$77.46
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2020		$50.80	$34.91	$85.71
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2021		$47.70	$39.51	$87.21
Iron Workers	7/1/2017		$47.30	$32.91	$80.21
Iron Workers	7/1/2019		$49.30	$34.41	$83.71
Iron Workers	1/1/2020		$49.80	$34.41	$84.21
Ironworker (Rodman)	7/1/2020		$44.82	$31.60	$76.42
Laborers (Class 01 - See notes)	5/1/2017		$29.75	$25.65	$55.40
Laborers (Class 01 - See notes)	5/1/2018		$31.25	$25.65	$56.90
Laborers (Class 01 - See notes)	5/1/2019		$31.95	$26.50	$58.45
Laborers (Class 01 - See notes)	5/1/2020		$33.95	$26.15	$60.10
Laborers (Class 01 - See notes)	5/1/2021		$36.20	$25.65	$61.85
Laborers (Class 02 - See notes)	5/1/2017		$29.95	$25.65	$55.60
Laborers (Class 02 - See notes)	5/1/2018		$31.45	$25.65	$57.10
Laborers (Class 02 - See notes)	5/1/2019		$32.15	$26.50	$58.65
Laborers (Class 02 - See notes)	5/1/2020		$34.15	$26.15	$60.30
Laborers (Class 02 - See notes)	5/1/2021		$36.40	$25.65	$62.05
Laborers (Class 03 - See notes)	5/1/2017		$29.95	$25.65	$55.60
Laborers (Class 03 - See notes)	5/1/2018		$31.45	$25.65	$57.10
Laborers (Class 03 - See notes)	5/1/2019		$32.15	$26.50	$58.65
Laborers (Class 03 - See notes)	5/1/2020		$34.15	$26.15	$60.30
Laborers (Class 03 - See notes)	5/1/2021		$36.40	$25.65	$62.05
Laborers (Class 04 - See notes)	5/1/2017		$24.55	$25.65	$50.20
Laborers (Class 04 - See notes)	5/1/2018		$26.05	$25.65	$51.70
Laborers (Class 04 - See notes)	5/1/2019		$26.75	$26.50	$53.25
Laborers (Class 04 - See notes)	5/1/2020		$28.75	$26.15	$54.90
Laborers (Class 04 - See notes)	5/1/2021		$31.00	$25.65	$56.65
Laborers (Class 05 - See notes)	5/1/2017		$30.60	$25.65	$56.25

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 05 - See notes)	5/1/2018		$32.10	$25.65	$57.75
Laborers (Class 05 - See notes)	5/1/2019		$32.80	$26.50	$59.30
Laborers (Class 05 - See notes)	5/1/2020		$34.80	$26.15	$60.95
Laborers (Class 05 - See notes)	5/1/2021		$37.05	$25.65	$62.70
Laborers (Class 06 - See notes)	5/1/2017		$30.65	$25.65	$56.30
Laborers (Class 06 - See notes)	5/1/2018		$32.15	$25.65	$57.80
Laborers (Class 06 - See notes)	5/1/2019		$32.85	$26.50	$59.35
Laborers (Class 06 - See notes)	5/1/2020		$34.85	$26.15	$61.00
Laborers (Class 06 - See notes)	5/1/2021		$37.10	$25.65	$62.75
Laborers (Class 07 - See notes)	5/1/2017		$30.50	$25.65	$56.15
Laborers (Class 07 - See notes)	5/1/2018		$32.00	$25.65	$57.65
Laborers (Class 07 - See notes)	5/1/2019		$32.70	$26.50	$59.20
Laborers (Class 07 - See notes)	5/1/2020		$34.70	$26.15	$60.85
Laborers (Class 07 - See notes)	5/1/2021		$36.95	$25.65	$62.60
Laborers (Class 08 - See notes)	5/1/2017		$30.25	$25.65	$55.90
Laborers (Class 08 - See notes)	5/1/2018		$31.75	$25.65	$57.40
Laborers (Class 08 - See notes)	5/1/2019		$32.45	$26.50	$58.95
Laborers (Class 08 - See notes)	5/1/2020		$34.45	$26.15	$60.60
Laborers (Class 08 - See notes)	5/1/2021		$36.70	$25.65	$62.35
Laborers (Class 09 - See notes)	5/1/2017		$30.10	$25.65	$55.75
Laborers (Class 09 - See notes)	5/1/2018		$31.60	$25.65	$57.25
Laborers (Class 09 - See notes)	5/1/2019		$32.30	$26.50	$58.80
Laborers (Class 09 - See notes)	5/1/2020		$34.30	$26.15	$60.45
Laborers (Class 09 - See notes)	5/1/2021		$36.55	$25.65	$62.20
Laborers (Class 10- See notes)	5/1/2017		$30.25	$25.65	$55.90
Laborers (Class 10- See notes)	5/1/2018		$33.30	$25.65	$58.95
Laborers (Class 10- See notes)	5/1/2019		$32.45	$26.50	$58.95
Laborers (Class 10- See notes)	5/1/2020		$34.45	$26.15	$60.60
Laborers (Class 10- See notes)	5/1/2021		$36.70	$25.65	$62.35
Laborers (Class 11 -See Notes)	5/1/2017		$30.15	$25.65	$55.80
Laborers (Class 11 -See Notes)	5/1/2018		$31.55	$25.65	$57.20
Laborers (Class 11 -See Notes)	5/1/2019		$32.35	$26.50	$58.85
Laborers (Class 11 -See Notes)	5/1/2020		$34.35	$26.15	$60.50
Laborers (Class 11 -See Notes)	5/1/2021		$36.50	$25.65	$62.15
Laborers (Class 12 -See Notes)	5/1/2017		$31.85	$25.65	$57.50
Laborers (Class 12 -See Notes)	5/1/2018		$32.45	$25.65	$58.10
Laborers (Class 12 -See Notes)	5/1/2019		$34.05	$26.50	$60.55
Laborers (Class 12 -See Notes)	5/1/2020		$36.05	$26.15	$62.20
Laborers (Class 12 -See Notes)	5/1/2021		$37.40	$25.65	$63.05
Laborers (Class 13 -See Notes)	5/1/2017		$33.88	$25.65	$59.53
Laborers (Class 13 -See Notes)	5/1/2018		$35.38	$25.65	$61.03
Laborers (Class 13 -See Notes)	5/1/2019		$36.08	$26.50	$62.58
Laborers (Class 13 -See Notes)	5/1/2020		$38.08	$26.15	$64.23
Laborers (Class 13 -See Notes)	5/1/2021		$40.33	$25.65	$65.98

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 14 -See Notes)	5/1/2017		$30.00	$25.65	$55.65
Laborers (Class 14 -See Notes)	5/1/2018		$31.50	$25.65	$57.15
Laborers (Class 14 -See Notes)	5/1/2019		$32.20	$26.50	$58.70
Laborers (Class 14 -See Notes)	5/1/2020		$34.20	$26.15	$60.35
Laborers (Class 14 -See Notes)	5/1/2021		$36.45	$25.65	$62.10
Laborers Utility (PGW ONLY) (Flagperson)	5/1/2017		$23.52	$17.58	$41.10
Laborers Utility (PGW ONLY)	5/1/2017		$30.55	$17.58	$48.13
Landscape Laborer	5/1/2016		$21.19	$22.65	$43.84
Landscape Laborer	5/1/2019		$24.22	$23.50	$47.72
Landscape Laborer	5/1/2020		$26.13	$22.95	$49.08
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2017		$44.87	$28.14	$73.01
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2018		$46.41	$28.60	$75.01
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2019		$46.41	$30.60	$77.01
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2020		$47.96	$31.20	$79.16
Operators Class 01 - See Notes (Building, Heavy, Highway)	5/1/2021		$49.50	$31.51	$81.01
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2017		$47.86	$29.03	$76.89
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2018		$49.41	$29.49	$78.90
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2019		$49.41	$31.49	$80.90
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2020		$50.96	$32.09	$83.05
Operators Class 01a - See Notes (Building, Heavy, Highway)	5/1/2021		$52.51	$32.39	$84.90
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2017		$44.62	$28.07	$72.69
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2018		$46.16	$28.53	$74.69
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2019		$46.16	$30.53	$76.69
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2020		$47.71	$31.13	$78.84
Operators Class 02 - See Notes (Building, Heavy, Highway)	5/1/2021		$49.25	$31.44	$80.69
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2017		$47.61	$28.97	$76.58
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2018		$49.16	$29.42	$78.58
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2019		$49.17	$31.41	$80.58
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2020		$50.71	$32.02	$82.73
Operators Class 02a - See Notes (Building, Heavy, Highway)	5/1/2021		$52.27	$32.31	$84.58
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2017		$40.53	$26.87	$67.40

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2018		$42.07	$27.33	$69.40
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2019		$42.08	$29.32	$71.40
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2020		$43.62	$29.93	$73.55
Operators Class 03 - See Notes (Building, Heavy, Highway)	5/1/2021		$45.16	$30.24	$75.40
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2017		$40.24	$26.78	$67.02
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2018		$41.78	$27.22	$69.00
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2019		$41.78	$29.23	$71.01
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2020		$43.32	$29.84	$73.16
Operators Class 04 - See Notes (Building, Heavy, Highway)	5/1/2021		$44.86	$30.15	$75.01
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2017		$38.51	$26.27	$64.78
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2018		$40.05	$26.73	$66.78
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2019		$40.06	$28.72	$68.78
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2020		$41.60	$29.33	$70.93
Operators Class 05 - See Notes (Building, Heavy, Highway)	5/1/2021		$43.14	$29.64	$72.78
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2017		$37.52	$25.98	$63.50
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2018		$39.07	$26.43	$65.50
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2019		$39.07	$28.43	$67.50
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2020		$40.61	$29.04	$69.65
Operators Class 06 - See Notes (Building, Heavy, Highway)	5/1/2021		$42.16	$29.34	$71.50
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2017		$54.14	$32.47	$86.61
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2018		$55.99	$33.02	$89.01
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2019		$56.30	$35.11	$91.41
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2020		$58.16	$35.80	$93.96
Operators Class 07 (A) - See Notes (Building, Heavy, Highway)	5/1/2021		$60.00	$36.21	$96.21
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2017		$53.84	$32.40	$86.24
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2018		$55.70	$32.92	$88.62
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2019		$56.00	$35.03	$91.03

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 22-04713 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2020		$57.86	$35.72	$93.58
Operators Class 07 (B) - See Notes (Building, Heavy, Highway)	5/1/2021		$59.72	$36.11	$95.83
Painters Class 2 (see notes)	2/1/2021		$47.56	$29.35	$76.91
Painters Class 2 (see notes)	2/1/2022		$48.62	$30.29	$78.91
Painters Class 3 (see notes)	2/1/2021		$58.52	$29.39	$87.91
Painters Class 3 (see notes)	2/1/2022		$59.58	$30.33	$89.91
Pile Driver Divers (Building, Heavy, Highway)	5/1/2022		$57.16	$37.99	$95.15
Pile Driver Divers (Building, Heavy, Highway)	11/1/2022		$59.04	$37.99	$97.03
Pile Driver Divers (Building, Heavy, Highway)	5/1/2023		$63.10	$37.99	$101.09
Pile Driver Divers (Building, Heavy, Highway)	5/1/2024		$66.25	$37.99	$104.24
Pile Driver Divers (Building, Heavy, Highway)	5/1/2025		$69.04	$37.99	$107.03
Pile Driver Divers (Building, Heavy, Highway)	5/1/2026		$71.23	$37.99	$109.22
Piledrivers	5/1/2021		$43.73	$37.99	$81.72
Piledrivers	5/1/2022		$45.73	$37.99	$83.72
Piledrivers	11/1/2022		$47.23	$37.99	$85.22
Piledrivers	5/1/2023		$50.48	$37.99	$88.47
Piledrivers	5/1/2024		$52.98	$37.99	$90.97
Piledrivers	5/1/2025		$55.23	$37.99	$93.22
Piledrivers	5/1/2026		$56.98	$37.99	$94.97
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2017		$51.91	$32.53	$84.44
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2020		$60.47	$36.93	$97.40
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2022		$61.34	$40.28	$101.62
Steamfitters	5/1/2018		$56.37	$34.39	$90.76
Truckdriver class 1(see notes)	5/1/2017		$30.31	$17.96	$48.27
Truckdriver class 1(see notes)	5/1/2018		$31.78	$17.96	$49.74
Truckdriver class 1(see notes)	5/1/2019		$32.06	$19.19	$51.25
Truckdriver class 1(see notes)	5/1/2020		$34.78	$17.96	$52.74
Truckdriver class 1(see notes)	5/1/2021		$36.33	$17.96	$54.29
Truckdriver class 2 (see notes)	5/1/2017		$30.41	$17.96	$48.37
Truckdriver class 2 (see notes)	5/1/2018		$31.88	$17.96	$49.84
Truckdriver class 2 (see notes)	5/1/2019		$32.16	$19.19	$51.35
Truckdriver class 2 (see notes)	5/1/2020		$34.88	$17.96	$52.84
Truckdriver class 2 (see notes)	5/1/2021		$36.43	$17.96	$54.39
Truckdriver class 3 (see notes)	5/1/2017		$30.66	$17.96	$48.62
Truckdriver class 3 (see notes)	5/1/2018		$32.13	$17.96	$50.09
Truckdriver class 3 (see notes)	5/1/2019		$32.41	$19.19	$51.60
Truckdriver class 3 (see notes)	5/1/2020		$35.13	$17.96	$53.09
Truckdriver class 3 (see notes)	5/1/2021		$36.68	$17.96	$54.64

PUBLIC WORKS EMPLOYMENT VERIFICATION ACT

In accordance with Act of July 5, 2012 (P.L. 1086, No. 127), known as the "Public Works Employment Verification Act" (43 P.S. 167.1 et. seq.), Contractor and subcontractors (if any) shall verify employment eligibility. An employee is an individual hired by Contractor or a subcontractor for whom Contractor or subcontractor is required by law to file a Form W-2 with the Internal Revenue Service. The Act does not apply to material suppliers for projects.

Contractor and subcontractors shall participate in EVP and shall, subject to the requirements of Federal law governing the use of EVP, use EVP to verify employment eligibility of each new employee (EVP is the E-Verify Program operated by the Department of Homeland Security that electronically verifies employment eligibility for employees). The Department of General Services of the Commonwealth shall post on its publicly accessible Internet website information regarding the requirements of Federal law governing the use of EVP. In conducting the verification required, Contractor and subcontractors shall not discriminate against an employee on the basis of race, ethnicity, color or national origin.

As a precondition of being awarded a contract for a Public Work, as defined in the Pennsylvania Prevailing Wage Act, 43 P.S. 165.1 et. seq.; or with respect such a contract that was awarded prior to the effective date identified in Section 20 of the Act but has not yet been executed, prior to the execution of the contract, Contractor shall provide OWNER with a verification form described in Subsection (c) of Section 4, acknowledging its responsibilities under and its compliance with Section 3 of the Act. Contracts between Contractor and subcontractors shall contain information about the requirements of the Act.

Prior to commencing work on a public works project, subcontractor(s) shall provide the OWNER with a verification form described in Subsection (c) of Section 4 of the Act acknowledging subcontractor's responsibilities and compliance with Section 3 of the Act. Contracts between a subcontractor and its subcontractors shall contain information about the requirements of the Act.

The verification required by Section 4 of the Act shall be in a form prescribed by the Secretary of General Services of the Commonwealth and shall be posted on the Internet, and shall comply with the following additional requirements:

(1) The statement shall include a certification that the information in the statement is true and correct and the individual signing the statement understands the submission of false or misleading information in connection with the verification shall subject the individual and the Contractor or subcontractor, as the case may be, to sanctions provided by law.

(2) The statement shall be signed by a representative of the Contractor or subcontractor, as applicable, who has sufficient knowledge and authority to make the representations and certifications contained in the statement.

The Public Works Employment Verification Form is on the next page.

COMMONWEALTH OF PENNSYLVANIA

PUBLIC WORKS EMPLOYMENT VERIFICATION FORM

Date _____

Business or Organization Name (Employer) _____

Address _____

City _____ State _____ Zip Code _____

☐ Contractor ☐ Subcontractor (check one)

Contracting Public Body _____

Contract/Project No Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22

Project Description _____

Project Location _____

As a contractor/subcontractor for the above referenced public works contract, I hereby affirm that as of the above date, our company is in compliance with the Public Works Employment Verification Act ('the Act') through utilization of the federal E-Verify Program (EVP) operated by the United States Department of Homeland Security. To the best of my/our knowledge, all employees hired post January 1, 2013 are authorized to work in the United States.

It is also agreed to that all public works contractors/subcontractors will utilize the federal EVP to verify the employment eligibility of each new hire within five business days of the employee start date throughout the duration of the public works contract. Documentation confirming the use of the federal EVP upon each new hire shall be maintained in the event of an investigation or audit.

I, _____, authorized representative of the company above, attest that the information contained in this verification form is true and correct and understand that the submission of false or misleading information in connection with the above verification shall be subject to sanctions provided by law.

_____
Authorized Representative Signature

Restoration and Renovation of the Farmhouse
for the African American Museum of Bucks County
Spec #39-07/22

STEEL ORIGIN CERTIFICATION: GENERAL CONTRACTOR

This form must be executed by the General Contractor and submitted prior to delivery. No steel product may be delivered on-site unless the County of Bucks has received this Steel Origin Certification. A completed certificate is required for each type of steel product (e.g., beams, columns, stairways, etc.), from each supplier but not for each piece of steel product.

A. TO BE COMPLETED BY THE PRIME CONTRACTOR:

1. Name of Contractor's firm: _____
2. Firm's address: _____
3. Firm's phone number: _____ 4. Date submitted: _____
5. Contract Title: Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County 6. Spec #: 39-07/22
7. Steel Product Certified: _____ 8. GSC-23: _____
9. Name and Address of Supplier: _____

B. TYPE OF STEEL PRODUCT (Check and complete one applicable category):

1. **Identifiable Steel Product:** 100% of the steel in the product is identifiably marked as manufactured in the United States.

    a. Other documentation required: **NONE**
    b. Manner in which steel product is identifiable:

        (1) Stamped "**Made in U.S.A.**"
        (2) Stamped "Made in _____".
        (3) Other, Explain: _____

2. **Non-identifiable structural steel:** Less than 100% of the steel contained in the product is identifiable as provided above. Structural steel is defined as steel products used as a basic structural element of a project (i.e., steel beams, columns, decking, stairways, reinforcing bars, structural lintels, pipes, etc.)

    a. Other documentation required: Bills of lading, invoices and mill certificates that certify that the steel contained in the product was melted and/or manufactured in the United States.

3. **Non-identifiable non-structural steel:** All other steel products, including door and window frames, machines, equipment, etc.

    a. Documentation required: Itemized list with the Country of manufacturer, if known, attached to this Steel Origin Certificate.

CERTIFICATION: I, the undersigned officer of the Contractor, do hereby certify that, to the best of my knowledge, the steel product listed above complies with the provisions of the Steel Products Procurement Act (73 P.S. § 1881, et seq., as amended). I understand that by signing this document I certify that the facts contained herein are true. I further understand that this document is subject to the provisions of the Unsworn Falsification to Authorities (18 P.S. § 4904) and the Steel Products Procurement Act, which provides penalties including, but not limited to, debarment from bidding on any Commonwealth of Pennsylvania public works project for a period of five years. I agree to provide documentation supporting these facts if requested by the County of Bucks. The County of Bucks reserves the right to pursue any action deemed necessary to protect the County of Bucks interest and ensure compliance with the laws of the Commonwealth.

WITNESS:

_____	_____(Seal)
Name:	Name
Secretary or Treasurer	President or Vice President

Restoration and Renovation of the Farmhouse
for the African American Museum of Bucks County
Spec #39-07/22

WAIVER OF LIENS

WHEREAS, _____

entered into a contract with the County of Bucks to provide materials and perform labor necessary for the construction of the Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22 upon a lot of ground located at 867 Newtown-Langhorne Road, Langhorne PA.

NOW, THEREFORE, it is hereby stipulated and agreed by and between the said parties, as part of the said contract and for the consideration therein set forth, that neither the undersigned contractor, any subcontractor or material man, nor any other person furnishing labor or materials to the said contractor under this contract shall file a lien, commonly called a mechanic's lien, for work done or materials furnished to the said building or any part thereof.

This stipulation is made and intended to be filed with the County Prothonotary in accordance with the requirements of Section 1402 of the Mechanics Lien Law of 1963 of the Commonwealth of Pennsylvania in such case provided.

IN WITNESS WHEREOF, the said parties hereto have hereunto set their hands and seals this ____day of _____, 20__.

COUNTY OF BUCKS

By:_____
Authorized Signature

Attest:
By:_____

CONTRACTOR
By:_____
Contractor Authorized Signature

_____
Typed Name and Title for Contractor

RESPONSIBLE CONTRACTORS ORDINANCE

The County of Bucks has enacted Ordinance 162, as amended by Ordinance 167, setting forth certain provisions to ensure that contractors and subcontractors performing work valued at over $250,000 on any public works project undertaken by the County for the construction, demolition, alteration, renovation, service or maintenance work are qualified, responsible contractors and subcontractors having sufficient capabilities in all respects to successfully perform the contracts on which they are engaged, including the necessary experience, equipment, technical skills and qualifications and organizational, financial and personnel resources.

A bidder proposing to submit a bid on such projects is required to be pre-qualified in accordance with Ordinance 162 and Ordinance 167, by submitting a Contractor Responsibility Certification Form at least 14 calendar days prior to the specified bid submission date. Ordinance 162 and Ordinance 167 and the Contractor Responsibility Certification Form are included in this Section.

Following review of the certification, the County will notify a prospective bidder within seven calendar days prior to the bid submission date of its determination as to the prospective bidder's qualifications.

Within seven calendar days of receiving a Notice of Intent to Award, the contractor shall submit a Subcontractor List and Subcontractor Responsibility Certifications as required by these Ordinances. A contractor may not divide divisions of work among multiple subcontractors performing the same work so as to avoid the $250,000 threshold for applicability of Ordinance 162 and Ordinance 167.

Instructions for submission of the Contractor Responsibility Certification Form:

- Bidder shall complete the Contractor Responsibility Certification Form in it's entirety. Bidder is required to check all the boxes on the form.
- Bidder shall email the completed form to RCOcertification@buckscounty.org no later than 14 calendar days prior to the specified bid submission date.
- The County will acknowledge receipt of the form.
- The County will review the form and within seven calendar days prior to the bid submission date, will notify the Bidder its determination of the Bidders qualifications.
- The County will only consider bid responses from Bidders it has determined to be qualified.

COUNTY OF BUCKS
Commonwealth of Pennsylvania

RESPONSIBLE CONTRACTOR ORDINANCE

ORDINANCE NO. 162

Enacted March 4, 2020

AN ORDINANCE OF THE COUNTY OF BUCKS, COMMONWEALTH OF PENNSYLVANIA, PROVIDING FOR THE ADOPTION OF CERTAIN PROCEDURES RELATED TO THE SOLICITATION AND AWARD OF PUBLIC CONTRACTS; PROVIDING FOR CERTIFICATION REQUIREMENTS FOR PUBLIC CONTRACTORS AND SUBCONTRACTORS TO PUBLIC CONTRACTS; PROVIDING FOR PUBLIC CONTRACT REVIEW PROCEDURES; PROVIDING FOR ASSURANCE ON THE USE OF PROPERLY TRAINED CONSTRUCTION PERSONNEL; REPEALING INCONSISTENT ORDINANCES OR PARTS OF ORDINANCES; CONTAINING A SAVINGS CLAUSE AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, Bucks County ("County") is empowered to enact certain laws needed to protect its proprietary and financial interests relating to major capital investments it makes in public works projects, as well as those relating to the public health, safety, and welfare of its residents;

WHEREAS, the County has particular concerns regarding the challenges it faces in planning and executing public works construction projects, especially those relating to its ability to ensure the use of properly qualified contractors and subcontractors and adequate numbers of craft personnel who have industry recognized training in the respective skills and trades needed for future projects;

WHEREAS, the County adopts the Responsible Contractor Resolution ____, attached hereto as Exhibit A, resolving to address the above-referenced challenges through appropriate procurement and contracting legislation as embodied in this ordinance and wishes to incorporate the terms of this Resolution in their entirety as material terms of this ordinance.

NOW, THEREFORE, BE IT ORDAINED AND ENACTED by the County, the following requirements are adopted for public works contracts as specified herein:

SECTION 1

§1. Purpose

The County recognizes there is a need to ensure that all work on public construction and maintenance contracts is performed by responsible, qualified firms that maintain the capacity, expertise, personnel and other qualifications and resources necessary to successfully perform public contracts in a timely, reliable and cost-effective manner.

To effectuate the purpose of selecting responsible contractors for public contracts and to protect the County's proprietary investments in such contracts, prospective contractors and sub-contractors, should be required to meet pre-established, clearly defined minimum standards relating to contractor responsibility, particularly requirements concerning technical qualifications, competency, experience, adequacy of resources, including equipment, financial and personnel, and satisfactory records of past performance in terms of safety, law compliance and business integrity.

It is also critical to recognize that due to the substantial impact that skilled craft labor has on public works projects, and due to the limited availability of skilled construction craft labor and imminent craft labor skill shortages, it is necessary to require contractors and subcontractors to participate in established, formal apprenticeship training programs as a condition of bidding and

performing work, for the purpose of both promoting successful project delivery and ensuring future workforce development needed for future projects.

Therefore, the County shall require compliance with the provisions of this ordinance by business entities seeking to provide services to the County as specified herein. The requirements of this ordinance are intended to supplement, not replace, existing contractor qualification and performance standards or criteria currently required by law, public policy or contracting documents. However, in the event that any of the provisions of this ordinance conflict with any law, public policy or contracting documents of the County, this ordinance act shall prevail.

§2. Responsible Contractor Requirements

(a) This ordinance shall apply to all public works projects undertaken by the County for construction, demolition, alteration, renovation, repair, service and maintenance work valued at or above $250,000.00 and shall apply to all contractors and subcontractors at any tier on such projects.

(b) All firms engaged in contracts covered by this ordinance shall be qualified, responsible contractors or subcontractors that have sufficient capabilities in all respects to successfully perform contracts on which they are engaged, including the necessary experience, equipment, technical skills and qualifications and organizational, financial and personnel resources. Firms bidding on public contracts shall also be required to have a satisfactory record of past performance, law compliance and business ethics.

§3 Contractor Responsibility Certifications

(a) As a condition of performing work on a public works contract subject to this ordinance, a general contractor, construction manager or other lead or prime contractor seeking award of a contract shall submit a Contractor Responsibility Certification. Subcontractors used on the contract are likewise required to provide similar Subcontractor Responsibility Certifications as provided by section 6 of this ordinance.

(b) The Contractor Responsibility Certification shall be completed on a form provided by the County and shall reference the project for which a bid is being submitted by name and contract or project number.

(c) In the Contractor Responsibility Certification the construction manager, general contractor or other lead or prime contractor shall confirm and certify the following facts regarding its past performance and work history and its current qualifications and performance capabilities:

(1) The firm and its employees have all valid, effective licenses, registrations or certificates required by federal, state, county, or local law, including, but not limited to, licenses, registrations or certificates required to: (a) do business in the designated locale; and (b) perform the contract work it seeks to perform. These shall include, but not limited to, licenses, registrations or certificates for any type of construction or maintenance trade work or specialty work which the firm proposes to self-perform.

(2) The firm meets the bonding requirements for the contract, as required by applicable law or contract specifications and any insurance requirements, as required by applicable law or contract specifications, including general liability insurance, workers compensation insurance and unemployment insurance.

(3) The firm has not been debarred or suspended by any federal, state or local government agency or authority in the past three years.

(4) The firm has not defaulted on any project in the past three years.

(5) The firm has not had any type of business, contracting or trade license, registration, or other certification revoked or suspended in the past three years.

(6) The firm and its Principals/owners have not been convicted of any crime relating to the contracting business in the past ten years.

(7) The firm has not within the past three years been found in violation of any law applicable to its contracting business, including, but not limited to, licenses laws, tax laws, prompt payment laws, wage and hour laws, prevailing wage laws, environmental laws or others, where the result of such violation was the payment of a fine, back pay damages or any other type of penalty in the amount of $1,000 or more.

(8) The firm will pay all craft employees that it employs on the project the current wage rates and fringe benefits as required under applicable federal, state or local wage laws.

(9) All craft labor that will be employed by the firm for the project have completed at least the OSHA 10 hour training course for safety established by the U.S. Department of Labor, Occupational Safety & Health Administration.

(10) The firm will employ craft employees in all classifications and individual trades required to successfully perform the work related to this project.

(11) The firm participates in a Class A Apprenticeship Training Program, as defined below, for each separate trade or classification in which it employs craft employees. This apprenticeship requirement assures that workers in each trade or craft employed are graduates of an apprenticeship training program in each trade or craft in which their services are utilized.

A. For purposes of this section, a Class A Apprenticeship Program is an apprenticeship program that is currently registered with and approved by the U.S. Department of Labor or a state apprenticeship agency and has graduated apprentices to journey person status for at least three of the past five years. This may be an apprenticeship program that is subject to the Employee Retirement Income Security Act of 1974, 29 U.S.C. § 1001 et seq. ("ERISA"), or a non-ERISA program.

B. To demonstrate compliance with this section, the firm shall provide, with this certification, a list of all trades or classifications of craft employees it will employ on the project and documentation verifying it participates in a Class A Apprenticeship Program for each trade or classification listed.

(12) The firm has all other technical qualifications and resources, including equipment, personnel and financial resources, to perform the referenced contract, or will obtain same through the use of qualified, responsible subcontractors.

(13) The firm will maintain all qualifications, resources and capabilities referenced in this certification throughout the duration of the project.

(14) The firm shall notify the County within seven days of any material changes to all matters attested to in this certification.

(15) The firm understands that the Contractor Responsibility Certification required by this section shall be executed by a person who has sufficient knowledge to address all matters in the certification and shall include an attestation stating, under the penalty of perjury, that the information submitted is true, complete and accurate.

(d) Execution of the Contractor Responsibility Certification required by this ordinance shall not establish a presumption of contractor responsibility and the County may require any additional information it deems necessary to evaluate a firm's status as a responsible contractor, including technical qualifications, financial capacity or other resources and performance capabilities. The County may require that such information be included in a separate Statement of Qualifications and Experience or as an attachment to the Contractor Responsibility Certification.

(e) The submitting firm shall stipulate in its Contractor Responsibility Certification that, if it receives a Notice of Intent to Award Contract, it will provide a Subcontractor List and required subcontractor information as specified in Section 6 of this ordinance.

(f) If the submitting firm has ever operated under another name or is controlled by another company or business entity or in the past five years controlled or was controlled by another

company or business entity, whether as a parent company, subsidiary or in any other business relation, it shall attach a separate statement to its Contractor Responsibility Certification that explains in detail the nature of any such relationship. Additional information may be required from such an entity if the relationship in question could potentially impact contract performance.

(g) If a firm fails to provide a Contractor Responsibility Certification required by this section, it shall be disqualified from bidding. No action of any nature shall lie against the County because of its refusal to accept a bid for failing to provide information required by this section.

§4. Pre-Qualification Requirements

Each firm subject to the requirements of this Ordinance must submit a Contractor Responsibility Certification at least fourteen (14) calendar days before the specified bid submission deadline. Failure to submit a Contractor Responsibility Certifiation by the aforesaid deadline will automatically disqualify any firm from submitting a bid or proposal for a contract.

Upon the receipt of the pre-qualification Contractor Responsibility Certification, the County shall determine whether the firm meets the requirements set forth in this Ordinance. Notice of the County's determination shall be sent to the proposed firm no less than seven (7) calendar days before the specified bid submission deadline. All firms that are determined by the County to meet the qualification requirements of this Ordinance shall be entitled to submit a bid or proposal for the project.

§5. Waiver of Requirements

Upon a determination by three members of the Board of Commissioners that any public funding requirement for a specific project limits or precludes the application of any specific provisions of this Ordinance, such provisions may be waived by unanimous vote by the Board.

§6. Notice of Intent to Award Contract

(a) After it has received bids for a project, the County shall issue a Notice of Intent to Award Contract to the firm offering the lowest responsible bid.

(b) Such Notice shall be issued immediately or as soon as practicable after bids are opened and Notice of Intent to Award Contract. The Notice shall stipulate that the contract award is conditioned on the issuance of a written Contractor Responsibility Determination, as required by Section 7 and any other conditions deemed appropriate by the County.

§7. Subcontractor Lists, Subcontractor Responsibility Certifications

(a) A prospective awardee shall submit to the County a Subcontractor List containing the names of any subcontractors that will be used for the referenced project, their addresses and a description of the work each listed subcontractor will perform on the project.

(b) At the time a perspective awardee submits the Subcontractor List it shall also submit Subcontractor Responsibility Certifications for all listed subcontractors to the County. Subcontractor Responsibility Certifications shall be executed by the respective subcontractors on forms prepared by the County and shall contain the same information and representations required in Contractor Responsibility Certifications, including verification of apprenticeship qualifications as required by Section 3(c)(11), for each trade or classification of craft workers it will employ on the project.

(c) Subcontractor Responsibility Certifications shall be executed by person having sufficient knowledge to address all matters in the certification and shall include an attestation stating, under the penalty of perjury, that all information submitted is true, complete and accurate.

§8. Contractor Responsibility Review and Determination

(a) After a Notice of Intent to Award Contract has been issued, the County shall undertake a review process to determine whether the prospective awardee is a qualified, responsible contractor in accordance with the requirements of this ordinance and other applicable laws

and regulations and has the resources and capabilities to successfully perform the contract. The time of the review process shall be as determined necessary by the County.

(b) As part of this review process, the County shall ensure that the Contractor Responsibility Certification, the Subcontractor List and the Subcontractor Responsibility Certifications, as required by this ordinance, have been submitted and properly executed.

(c) The County may conduct any additional inquiries to verify that the prospective awardee and its subcontractors have the technical qualifications and performance capabilities necessary to successfully perform the contract and that the firms have a sufficient record of law compliance and business integrity to justify the award of a public contract. In conducting such inquiries, the County may seek relevant information from the firm, its prior clients or customers, its subcontractors or any other relevant source.

(d) If at the conclusion of the review process the County determines that all responsibility certifications have been properly completed and executed and if it concludes that the qualifications, background and responsibility of the prospective awardee and the firms on its Subcontractor List are satisfactory, it may issue a formal written Contractor Responsibility Determination verifying that the prospective awardee is a qualified, responsible contractor. In the event a firm is determined to be non-responsible, the County shall proceed to conduct a responsibility review of the next lowest, responsive bidder or, if necessary, rebid the project.

(e) A Contractor Responsibility Determination may be issued after the conclusion of the review process under Section 5. A Responsibility Determination may be revoked or revised in any manner at any time if the County obtains relevant information warranting any such revocation or revisions.

§9. Subcontractor Responsibility Review Requirements

(a) A construction manager, general contractor or other lead or prime contractor shall not be permitted to use a subcontractor on any work performed for the County unless it has identified the subcontractor on its Subcontractor List and provided a Subcontractor Responsibility Certification in accordance with the requirements of Section 6.

(b) A subcontractor listed on a firm's Subcontractor List shall not be substituted unless written authorization is obtained from County and a Subcontractor Responsibility Certification is provided for the substitute subcontractor.

(c) In the event that the County determines that a prospective subcontractor listed by the apparent low bidder does not meet the responsibility standards of this Section, it may, after informing the prospective awardee, exercise one of the following options:

(1) permit the awardee to substitute a qualified, responsible, subcontractor in accordance with the requirements of this section;

(2) require the awardee to self-perform the work in question if the firm has the required experience, licenses and other qualifications to perform the work in question; or

(3) disqualify the prospective awardee.

In the event that a subcontractor is disqualified under this ordinance, the general contractor, construction manager or other lead or prime contractor shall not be permitted to make any type of contractual claim against the County the basis of a subcontractor disqualification.

§10. False or Misleading Responsibility Certifications

If the County determines that a Contractor or Subcontractor Responsibility Certification contains false or misleading material information that was provided knowingly or with reckless disregard for the truth or omits material information knowingly or with reckless disregard of the truth, the firm for which the certification was submitted shall be prohibited from performing work for the County for a period of three years and shall be subject to any other penalties and sanctions, including contract termination, available to the County under law. A contract terminated under these circumstances shall further entitle the County to withhold payment of any monies due to the firm as damages.

§11. Execution of Final Contract

(a) A contract subject to this ordinance shall not be executed until all requirements of this ordinance have been fulfilled and until Contractor and Subcontractor Responsibility Certifications have been issued by the County under Section 6(d). Upon completion of all requirements under this ordinance, the County may execute a final contract based upon the Notice of Intent.

(b) Prior to the execution of a final contract under this Section, the County shall publicly post the Notice of Intent to Award, Contractor and Subcontractor Responsibility Certifications, Subcontractor Lists and Contractor Responsibility Determination on the County website for public inspection for a period of five (5) calendar days after the issuance of the Contractor Responsibility Determination.

SECTION 2

Any and all other ordinances or parts of ordinances in violation or in conflict with the terms, conditions and provisions of this ordinance are hereby repealed to the extent of such irreconcilable conflict.

SECTION 3

The terms, conditions and provisions of this ordinance are hereby declared to be severable, and, should any portion, part or provision of this ordinance be found by a court of competent jurisdiction to be invalid, enforceable or unconstitutional, the Board of Commissioners hereby declares its intent that the ordinance shall have been enacted without regard to the invalid, enforceable or unconstitutional portion, part or provision of this ordinance.

SECTION 4

This ordinance shall become effective thirty (30) days after enactment.

COUNTY OF BUCKS, PENNSYLVANIA

ATTEST:

By: _____
Diane M. Ellis-Marseglia, LCSW
Commissioner, Chair

_____
Gail Humphrey, Chief Clerk

By: _____
Robert J. Harvie, Jr.
Commissioner, Vice Chair

By: _____
Gene DiGirolamo
Commissioner

EXHIBIT A

COUNTY OF BUCKS

RESOLUTION NO. _____

WHEREAS, pursuant to 16 PA. CONS. STAT. § 1802, state competitive bidding law requires that most public works contracts be awarded to the lowest "*responsible*" bidder; and

WHEREAS, notwithstanding the importance of the "responsible" bidder requirement, there is very limited guidance for defining the term "*responsible*" in relevant statutes, regulations or case law and, therefore, prudent procurement and contracting policy dictates that this term should be more specifically defined; and in doing so, available guidance regarding the general meaning of the "responsible" contractor term should be followed, which typically relates to the technical qualifications and other capabilities relating to a contractor's ability to successfully deliver public works projects; and

WHEREAS, many states and local jurisdictions in the U.S. face critical contracting needs in the future, including those for public works and infrastructure projects, that will require significant efforts to plan, manage and oversee major capital investments in both the short and long term; *see* PRESIDENT'S COUNCIL OF ECON. ADVISORS, ECONOMIC BENEFITS AND IMPACTS OF EXPANDED INFRASTRUCTURE INVESTMENT 3 (2018) (estimating $4.6 trillion in infrastructure investment is needed between 2016 and 2025); and

WHEREAS, in undertaking its infrastructure and other public works projects, Bucks County ("County") seeks to utilize reliable and efficient procurement procedures that will help ensure that its projects are delivered with reasonable certainty, in a safe, timely manner, and in accordance with contract specifications and applicable industry codes at the lowest overall cost and best value; and

WHEREAS, securing successful delivery of projects in the construction industry is particularly difficult due to the unique, complex, unpredictable and inherently dangerous nature of the industry, wherein errors in project planning or execution can result in serious health and safety risks to project workers and/or the general public, significant and avoidable cost overruns, flawed or inferior projects, and disruptions in performance schedules that delay the availability and use of critical government facilities; MAUREEN CONWAY & ALLISON GERBER, ASPEN INST., WORKFORCE STRATEGIES INITIATIVE, CONSTRUCTION PRE-APPRENTICESHIP PROGRAMS: RESULTS FROM A NATIONAL SURVEY 6-7 (2009)(discussing complicating factors in successful delivery of construction projects and the risks of using poorly trained workers); and

WHEREAS, to protect its financial and proprietary interests in these projects, and to offset performance risks inherent to public works contracting, the County must utilize efficient procurement procedures that adequately protect and promote these interests, including clearly defined, pre-established evaluation criteria to address the unique challenges of capital construction and result in the selection of qualified, reputable contractors and subcontractors that are committed to the County's goals of safe, timely, cost-effective project delivery; and

WHEREAS, to establish efficient procurement procedures, the County specifically seeks to require that its public works contracts are performed by qualified "responsible" contractors and subcontractors that meet essential performance criteria, including: (a) satisfactory records of past performance, including compliance with applicable laws and industry regulations; and (b) adequate present performance capabilities, including contractor and subcontractor competency and availability of skilled craft personnel; and

WHEREAS, effective contracting procedure must recognize and address unique challenges relating to procurement in the construction industry, including the following:

(a) construction is a transient industry, which requires a careful review of a firm's past performance, as well as its current capabilities;

(b) construction is an inherently dangerous industry that requires craft personnel to receive proper safety training; Geetha M. Waehrer et. al., *Costs of Occupational Injuries in Construction in the United States*, 39 ACCIDENT ANALYSIS & PREVENTION 1258 (2007)(construction is a high risk industry and accounts for disproportionate share of work-related injuries); Bureau of Labor Statistics,

Fatalities in the Construction Industry, MONTHLY LAB. REV., July 2014 (industry accounts for 40% of all fatal work-related falls);

(c) under virtually any market conditions, construction projects require assurances of a reliable supply of well-trained craft personnel because it is a highly skilled, labor intensive industry; and

(d) the construction industry is currently facing acute, worsening skill shortages and such conditions pose major risks to the planning and execution of capital construction projects; CONSTRUCTION LABOR MARKET ANALYZER, CONSTRUCTION USERS ROUNDTABLE (CURT), THE LONG-TERM OUTLOOK FOR CONSTRUCTION 6 (2017)(estimating an impending deficit of 1.5 million skilled workers through 2022 in the construction industry); *see also*, Gabriela Rico, *Labor Shortage, steel-cost uncertainties halt work on highly anticipated Oro Valley senior community*, Arizona Daily Star (June 9, 2018), https://tucson.com/business/labor-shortage-steel-cost-worries-halt-anticipated-oro-valley-senior/article_9c48ee4f-7a90-5c89-90e2-aedd902738ec.html (discussing how labor shortage caused cancellation of $100 million senior living center; Anastachiah Ondieki, *Skilled labor shortages hit Vogtle as Georgia Power reports progress*, Atlanta Journal-Constitution (Apr. 20, 2018), https://www.ajc.com/news/local-govt--politics/skilled-labor-shortages-hit-vogtle-georgia-power-reports-progress/xaVdaBLjix0WXj4v6jYFwI/ (discussing how shortage of electricians in Georgia is delaying completion of nuclear power plant; Chirs Ramirez, *Labor shortage causes Exxon to shift construction plans*, Corpus Christi Caller-Times (Aug. 9, 2017), https://www.caller.com/story/news/2017/08/09/labor-shortage-causes-exxon-shift-construction-plans/525241001/ (discussing how shortage of welders in the Gulf Coast delayed construction of world's largest ethylene plant); Ben DuBose, *ECF '16: Energy Contractors Need Newcomers to Ease Labor Shortage*, Hydrocarbon Processing (Mar. 1, 2016), http://www.hydrocarbonprocessing.com/Article/3533820/Conference-news/ECF-16-Energy-contractors-need-newcomers-to-ease-labor-shortage.html (discussing how labor shortage contributes to a 65% failure rate among mega-projects in Gulf Coast Region); Gavin Aronsen, *Labor Shortage Delays DuPont Plant Completion*, Ames Tribune (Jan. 9, 2015), http://amestrib.com/news/labor-shortage-delays-dupont-plant-completion (discussing how the shortage of qualified workers delayed the completion of a $200 million DuPont ethanol plant in Iowa); and

WHEREAS, due to acute labor shortages in construction craft personnel, leading construction industry groups, including trade associations representing project owners, such as the Construction Users Roundtable (CURT), have repeatedly issued strong recommendations to parties purchasing construction services for large capital projects that they should adopt a pre-qualification standard that requires contractors and subcontractors to prove their participation in craft labor training programs in order to bid or perform work on projects; and

WHEREAS, the above-referenced recommendations are specifically designed to protect the project owner's financial and proprietary interests in capital projects by ensuring that such firms provide skill training to construction craft personnel and have an adequate supply of trained, skilled construction workers to perform their projects; CURT, WP-1101, SKILLED LABOR SHORTAGE RISK MITIGATION (January 2015)(recommending that, to address skill challenges, project owners require contractors to provide skills training as a condition of bidding projects); MATT HELMER & DAVE ALTSTADT, ASPEN INST., WORKFORCE STRATEGIES INITIATIVE, APPRENTICESHIP: COMPLETION AND CANCELLATION IN THE BUILDING TRADES 8-9 (2013)(proposing a requirement that all contractors participating in publicly funded projects participate in registered apprenticeship programs); ROBERT LERMAN ET AL., BENEFITS AND CHALLENGES OF REGISTERED APPRENTICESHIP: SPONSORS' PERSPECTIVE ii (2009)(finding that 97% of employer-sponsors of registered apprenticeship programs would recommend the program to others and that over 80% of sponsors cited filling the demand for skilled workers as a "very important" benefit of apprenticeship); CURT, CONFRONTING THE SKILLED WORKFORCE SHORTAGE (June 2004)(recommending all owners prequalify contractors on the basis of craft training); DAVID H. BRADLEY & STEPHEN A. HERZENBERG, CONSTRUCTION APPRENTICESHIP AND TRAINING IN PENNSYLVANIA 3 (2002)(describing "free rider" market failure that incentivizes employers to under-train construction workers in the absence of apprenticeship programs); and

WHEREAS, in seeking to ensure the adequate development of trained, skilled personnel for the construction industry, as well as other industries, the United States Congress passed the Fitzgerald Act, Pub. L. No. 75-308, 50 Stat. 664, which created a system in which workers could be properly trained in construction skills and safety procedures through organized, formally registered apprenticeship training programs that meet established quality, safety and performance standards and that such programs are approved and monitored by the U.S. Department of Labor and state labor agencies, including the Pennsylvania State Apprenticeship Council; and

WHEREAS, numerous construction industry organizations, as well as notable public policy groups, support apprenticeship as an effective means for providing craft labor personnel with essential training and skills, while providing them with valuable employment opportunities. For example, the Associated Builders and Contractors ("ABC")("ABC has become the world leader in apprenticeship and craft training in the merit shop construction industry"), https://www.abc.org/Education-Training/Craft-Training-Apprenticeship; *see also*, ABC Eastern PA Chapter ("ABC Apprenticeship program has played a critical role in developing our apprentices into Journeyworkers. They've gained the knowledge and hands on skills needed to be successful in the field and have played an integral part in growing our organization and allowing us the opportunity to expand into different locations and markets."); North America's Building Trade Unions ("apprenticeship programs train workers to become, highly-skilled . . . construction workers through a debt-free, technologically-advanced education . . . earn-as-you-learn programs with family-sustaining wages and provide health care coverage and retirement benefits"), https://nabtu.org/apprenticeship-and-training; Center for American Progress ("Apprenticeship is a proven worker training strategy that combines on-the-job training with classroom instruction . . . [f]or workers, apprenticeship means a real job that leads to a credential that is valued in the labor market. Apprentices are paid for their time spent on the job, accumulate little to no student debt, and are generally retained once they have successfully completed their programs; Aspen Institute ("Efforts to increase the number of apprenticeships have broad bipartisan support with advocates at the federal, state, and local levels. At the federal level, both the Trump administration and Obama administration prioritized expanding apprenticeship programs as a way to align the needs of workers and employers. In Congress, the Apprenticeship and Jobs Training Act of 2017—seeks to expand the use of apprenticeships through an employer tax credit—has earned bipartisan support" in both the House and Senate), https://www.aspeninstitute.org/blog-posts/apprenticeships-as-model-of-skills-based-training; and

WHEREAS, research from both government and industry underscore the need to expand the use of apprenticeship training across the economy, especially in construction, as a means for promoting skills training to address current and future workforce development needs; such reports include a joint report issued by various agencies of the federal government—U.S. DEP'TS OF LABOR, COMMERCE, EDUC., AND HEALTH AND HUMAN SERVS., WHAT WORKS IN JOB TRAINING: A SYNTHESIS OF THE EVIDENCE 8 (2014); WORKFORCE TRAINING AND EDUC. COORDINATING BD., WORKFORCE TRAINING RESULTS 2015 5, 47-49 (2015)(showing that, compared to other worker training programs in Washington state, apprenticeship training was "very successful" and ranked first in: increased annualized earnings for workers, net participant benefits, net public benefits, and present value of net returns to taxpayers); U.S. DEP'T OF COMMERCE, ECON. AND STATISTICS ADMIN. & CASE WESTERN RESERVE UNIV., THE BENEFITS AND COSTS OF APPRENTICESHIP: A BUSINESS PERSPECTIVE (showing apprenticeship programs are unanimously supported by participating employers and highly cost-effective due to numerous factors, including higher productivity of trained workers, improved safety, project quality, reliable project staffing, and reduction in employee turnover); COUNCIL OF ECON. ADVISORS, ADDRESSING AMERICA'S RESKILLING CHALLENGE 7-8 (2018)(showing that Federal, state, and local governments in the U.S. spend "far less" on retraining and reskilling than other advanced economies); Federal Executive Order promoting greater use of apprenticeship programs to train the U.S. workforce: Exec. Order No. 13,801, 82 Fed. Reg. 28,229 (June 20, 2017); and

WHEREAS, in recognizing the value created by apprenticeship training and the significant return-on-investment apprenticeship programs produce for employers, the Executive Branch has taken steps through Executive Orders and the creation of a task force devoted to apprenticeships to support and encourage the expansion of apprenticeship training programs nationwide in conjunction with private and public entities; Exec. Order No. 13,845, 83 Fed. Reg. 35,099 (July 24, 2018) (creating a National Council for the American Worker to promote apprenticeship training programs as a means of addressing the skills crisis facing the nation); TASK FORCE ON APPRENTICESHIP EXPANSION, FINAL REPORT TO THE PRESIDENT OF THE UNITED STATES 15 (2018) (estimating every dollar spent by employers on apprenticeship programs yields a return of $1.47); and

WHEREAS, the courts have consistently recognized that states and local jurisdictions seeking to protect substantial financial and proprietary interests have the right to enact contracting and procurement legislation and/or to impose contract bid specifications designed to ensure the performance capabilities of prospective contractors and subcontractors and their employees, including apprenticeship training requirements and other craft labor qualifications; *see Bldg. & Const. Trades Council of the Metro. Dist. v. Assoc. Builders & Contractors of Mass. and R.I., Inc.*, 507 U.S. 218 (1993); *Assoc. Builders & Contractors v. Mich. Dep't of Labor & Econ. Growth*, 543 F.3d 275 (6th Cir. 2008); *Hotel Emps. & Restaurant Emps. Union, Local 57 v. Sage Hospitality Res., LLC*, 390 F.3d 206 (3d Cir. 2004); *Assoc. Builders & Contractors, Inc. v. New Castle County*, 144 F. Supp. 3d

633 (D. Del. 2015); and *Allied Constr. Indus. v. City of Cincinnati*, No. 16-4248, 2018 WL 283775 (6th Cir. 2018); and

WHEREAS, the County finds that apprenticeship training programs which are registered with and approved by federal or state agencies, and maintained in accordance with regulations issued pursuant to the Fitzgerald Act, provide the most reliable means for securing a reliable supply of qualified craft labor for capital projects and further recognizes that essential levels of work quality, safety and cost-efficiency on its public works projects will be better achieved by requiring the use of contractors and subcontractors that participate in bona fide apprenticeship programs with a proven record of graduating apprentices and providing effective skill training in the construction industry; U.S. DEP'T OF LABOR EMP'T AND TRAINING ADMIN., REGISTERED APPRENTICESHIP FACT-SHEET 1 (2000) (workers that complete apprenticeships are more motivated, more productive, and have lower worker compensation costs because of training programs' emphasis on safety); PAUL M. GOODRUM, CONSTRUCTION INDUSTRY CRAFT TRAINING IN THE UNITED STATES AND CANADA (2000) (finding that for a single capital construction project, each dollar invested in craft training yields a return of $1.30 to $3.00); DEBBIE REED ET. AL, AN EFFECTIVENESS ASSESSMENT AND COST-BENEFIT ANALYSIS OF REGISTERED APPRENTICESHIP IN 10 STATES xiv (2012) (finding that the social benefit of an individual completing an apprenticeship training program exceeds the social costs by $49,000); and

WHEREAS, the County wishes to revise its procurement standards for public works construction to address these findings and considerations, limit project delivery risks and protect its financial and proprietary interests, and better ensure efficient procurement and successful delivery of these projects.

NOW, THEREFORE, BE IT RESOLVED that Bucks County is committed to addressing the challenges it faces relating to public works projects by enacting necessary and appropriate procurement legislation to protect its proprietary and financials interests and create adequate safeguards to ensure the successful delivery of such projects to the fullest extent possible.

COUNTY OF BUCKS, PENNSYLVANIA

ATTEST:

By: _____
Diane M. Ellis-Marseglia, LCSW
Commissioner, Chair

_____
Gail Humphrey, Chief Clerk

By: _____
Robert J. Harvie, Jr.
Commissioner, Vice Chair

By: _____
Gene DiGirolamo
Commissioner

COUNTY OF BUCKS
Commonwealth of Pennsylvania

RESPONSIBLE CONTRACTOR ORDINANCE AMENDMENTS

ORDINANCE NO. 167

Enacted March 16, 2022

AN ORDINANCE OF THE COUNTY OF BUCKS, COMMONWEALTH OF PENNSYLVANIA, AMENDING ORDINANCE NO. 162 ("RESPONSIBLE CONTRACTOR ORDINANCE")

WHEREAS, Bucks County ("County") enacted Ordinance No. 162, the Responsible Contractor Ordinance, on March 4, 2020, which has been successful in protecting the interests of the County and the public with respect to public works projects; and

WHEREAS, the Bucks County Commissioners seek to build on the success of Ordinance 162 in order to increase the percentage of skilled craft personnel who have the necessary training and skills needed for public works projects and to provide additional protections for the benefit of the County and its residents; and

WHEREAS, the provisions of Ordinance No. 162 are herein reaffirmed and ratified subject only to the amendments set forth herein. Except as amended herein, all provisions of Ordinance No. 162 shall be and remain in full force and effect and are incorporated as part of this ordinance.

NOW, THEREFORE, BE IT ORDAINED AND ENACTED that the County hereby **AMENDS** Ordinance No. 162 by deleting §2 and §3 in their entirety and replacing them as set forth below:

§2 Responsible Contractor Requirements

(a) This ordinance shall apply to all public works projects undertaken by the County for construction, demolition, alteration, renovation, service or maintenance of buildings, structures, or facilities valued at or above $250,000.00 and shall apply to all contractors and subcontractors of any tier that perform work on such projects.

(b) All firms engaged in public works contracts subject to this ordinance, including general contractors, construction managers, other lead or prime contractors, and subcontractors at any level, shall be qualified, responsible contracting firms that have sufficient capabilities in all respects to successfully perform contracts on which they are engaged, including the necessary experience, equipment, technical skills and qualifications and organizational, financial and personnel resources. Firms bidding or otherwise participating in public works contracts shall also be required to have a satisfactory past performance record and a satisfactory record of law compliance, integrity, and business ethics.

§3 Contractor Responsibility Certifications

(a) As a condition of performing work on a public works contract subject to this ordinance, a general contractor, construction manager or other lead or prime contractor seeking award of a contract shall submit a Contractor Responsibility Certification, as specified herein. Subcontractors used on the contract are likewise required to provide similar Subcontractor Responsibility Certifications as provided by §7 of this ordinance.

(b) The Contractor Responsibility Certification shall be completed on a form provided by the County and shall reference the project for which a bid is being submitted by name and contract or project number.

(c) In the Contractor Responsibility Certification, the construction manager, general contractor, or other lead or prime contractor shall confirm the following facts regarding its past performance and work history and its current qualifications and performance capabilities:

(1) The firm and its employees have all valid, effective licenses, registrations, certificates, or other credentials required by federal, state, county, or local law, including, but not limited to, licenses, registrations or certificates required to: (a) do business in the designated locale; and (b) perform the contract work it seeks to perform. These shall include, but not limited to, licenses, registrations, or certificates for any type of construction or maintenance trade work or specialty work which the firm proposes to self-perform.

(2) The firm meets the bonding requirements for the contract, as required by applicable law or contract specifications, as well as applicable insurance requirements for the contract including general liability insurance, workers compensation insurance and unemployment insurance.

(3) The firm has not been debarred or suspended by any federal, state, or local government agency or authority in the past three years.

(4) The firm has not defaulted on any project in the past three years.

(5) The firm has not had any type of business, contracting or trade license, registration, or other certification revoked or suspended in the past three years.

(6) The firm and its Principals/owners have not been convicted of any crime relating to its contracting business in the past ten years.

(7) Within the past three years, the firm has not been found in violation of any law applicable to its contracting business, including, but not limited to, licensing laws, tax laws, prompt payment laws, wage and hour laws, prevailing wage laws, environmental laws or others, where the result of such violation was the payment of a fine, back pay damages or any other type of penalty in the amount of $5,000 or more.

(8) The firm will employ a sufficient number of craft labor personnel required to successfully perform any project work it self-performs or shall use qualified subcontractors to meet this requirement and shall assign workers to perform only work in their respective craft or trade for which they have sufficient skills and training or shall use qualified subcontractors to meet this requirement.

(9) The firm will pay all craft employees on the project, at a minimum, the applicable wage and fringe benefit rates, as established for the classification in which the worker is employed, in accordance with 43 PA. CONS. STAT. § 165-1 *et. seq.*

(10) The firm will ensure that all craft labor it employs on the project will have completed, prior to working on the project, the OSHA 10-hour training course for safety established by the U.S. Department of Labor. If the firm is a prime contractor, it shall also ensure that at least one person on the project has completed the OSHA 30-hour construction training course established by the U.S. Department of Labor.

(11) The firm participates in a Class A Apprenticeship Training Program, as defined below, for each separate trade or classification in which it employs craft employees.

A. For purposes of this ordinance, a Class A Apprenticeship Program is an apprenticeship program registered with and approved by the U.S. Department of Labor or a state apprenticeship agency and has graduated apprentices to journey person status for at least three of the past five years. This may be an apprenticeship program subject to the Employee Retirement

Income Security Act of 1974, 29 U.S.C. § 1001 et seq. ("ERISA"), or a non-ERISA program.

B. To demonstrate compliance with this ordinance, the firm shall provide, with this certification, a list of all trades or classifications of craft employees it will employ on the project and documentation verifying it participates in a Class A Apprenticeship Program for each trade or classification listed.

C. The requirements of §§3(c)(11)-(12) of this ordinance help ensure that the bulk of the craft labor workforce employed on the project will have sufficent skills and training to correctly perform work assigned to them.

(12) The construction manager, general contractor or other lead or prime contractor responsible for the project shall ensure that at least 70 percent of the craft labor workers employed on the project shall be comprised of either journeyperson workers who have successfully completed a Class A Apprenticeship Program as defined in §3(c)11 of this ordinance or apprentices registered in such programs. The apprenticeship participation must be in the same trade or craft for which the workers are employed on the project.

(13) The firm shall assign craft labor personnel only work in the craft or trade in which they are employed.

(14) The firm has all other technical qualifications and resources, including equipment, personnel, and financial resources, to successfully perform the referenced contract and shall maintain such capabilities throughout the duration of the project, or will obtain same through the use of qualified, responsible subcontractors or vendors.

(15) The firm shall notify the County within seven days of any material changes in its operation that related to any matter attested to in this certification.

(16) The firm understands that the Contractor Responsibility Certification required by this ordinance shall be executed by a person who has sufficient knowledge to address all matters in the certification and shall include an attestation stating, under the penalty of perjury, that the information submitted is true, complete, and accurate.

(d) Execution of the Contractor Responsibility Certification required by this ordinance shall not establish a presumption of contractor responsibility, and the County may require any additional information it deems necessary to evaluate a firm's status as a responsible contractor, including information regarding the firm's technical qualifications, financial capacity or other resources and performance capabilities. The County may require that such information be included in a separate Statement of Qualifications and Experience or as an attachment to the Contractor Responsibility Certification.

(e) The submitting firm shall stipulate in the Contractor Responsibility Certification that, if it receives a Notice of Intent to Award Contract, it will provide a Subcontractor List and required subcontractor information as specified in §6 of this ordinance.

(f) If the submitting firm has ever operated under another name or is controlled by another company or business entity or in the past five years controlled or was controlled by another company or business entity, whether as a parent company, subsidiary or in any other business relation, it shall attach an appendix to its Contractor Responsibility Certification that explains in detail the nature of any such relationship. Additional information may be required from such an entity if the relationship in question could potentially impact contract performance.

(g) If a firm fails to provide a Contractor Responsibility Certification required by this ordinance, it shall be disqualified from bidding. No action of any nature shall lie against the County because of its refusal to accept a bid for this reason.

NOW, THEREFORE, BE IT ORDAINED AND ENACTED that the County further **AMENDS** Ordinance No. 162 by deleting §§6-11 in their entirety and replacing them as set forth below:

§6. Notice of Intent to Award Contract

(a) After it has received bids for a project, the County shall issue a Notice of Intent to Award Contract to the firm that has submitted the lowest responsible bid.

(b) Such Notice shall be issued immediately or as soon as practicable after bids are opened and shall stipulate that the contract award is conditioned on the issuance of a written Contractor Responsibility Determination for the firm, as required by §8 of this ordinance, compliance with Subcontractor Certifications required by §7 of the ordinance, and any other qualification standards required by the County.

§7. Subcontractor Responsibility Requirements

(a) Within seven (7) days of receiving a Notice of Intent to Award Contract, the prospective awardee shall submit to the County a Subcontractor List, which provides the name and address of the subcontractors it will use on the project, the scope of the work assigned to each subcontractor, and Subcontractor Responsibility Certifications as required by this ordinance.

(b) The prospective awardee shall not be permitted to use a subcontractor on any work performed for the County unless it has identified the subcontractor on its Subcontractor List and provided a Subcontractor Responsibility Certification in accordance with the requirements of §3.

(c) At the time a perspective awardee submits the Subcontractor List it shall also submit Subcontractor Responsibility Certifications and applicable supporting information for all listed subcontractors to the County. Subcontractor Responsibility Certifications shall be executed by the respective subcontractors on forms prepared by the County and shall contain the same information, representations, and supporting information required in Contractor Responsibility Certifications, including verification of apprenticeship qualifications as required by §3(c)(11), for each trade or classification of craft workers it will employ on the project.

(d) A prospective awardee shall determine whether any firm on its Subcontractor List is organized as a sole proprietership owned and operated by a single person. This shall apply to subcontractors at any tier. For any such entity, the prospective awardee shall ensure that the sole proprietership subcontractor is a legimate business entity and not a misclassified employee by requiring the subcontractor to supplement its Subcontractor Certification with its Employer Identification Number and copies of any license, certificate, or registration it is required to maintain in order to do business in the state in which it is located.

(e) A subcontractor listed on a firm's Subcontractor List shall not be substituted unless written authorization is obtained from the County and a Subcontractor Responsibility Certification is provided for the substitute subcontractor.

(f) In the event that the County determines that a subcontractor fails to meet the requirements of this ordinance or is otherwise determined to be non-responsible, it may, after informing the prospective awardee, exercise one of the following options:

(1) Permit the awardee to substitute a qualified, responsible subcontractor in accordance with the requirements of this ordinance, upon submission of a completed Subcontractor Certification for the substitute and approval of the substitute by the County.

(2) Require the awardee to self-perform the work in question if the firm has the required experience, licenses, and other qualifications to perform the work in question; or

(3) Disqualify the prospective awardee.

(g) In the event a subcontractor is disqualified under this ordinance, the general contractor, construction manager or other lead or prime contractor shall not be permitted to make any type of claim against the County based on a subcontractor disqualification.

§8. Contractor Responsibility Review and Determination

(a) After the County has issued a Notice of Intent to Award Contract to the lowest responsive bidder, it shall undertake a contractor responsibility review process to determine whether the firm is a qualified, responsible firm in accordance with the requirements of this ordinance and other applicable laws and regulations. The time frame for conducting this review process shall be as determined by the County.

(b) As part of the review process, the County shall ensure that the Contractor Responsibility Certification and Subcontractor Responsibility Certifications and applicable supporting information comply with the requirements of this ordinance.

(c) The County may conduct any additional inquiries to verify that the prospective awardee and its subcontractors have the technical qualifications and performance capabilities necessary to successfully perform the contract and that the firms have a sufficient record of law compliance, integrity, and business ethics to justify the award of a public contract. In conducting such inquiries, the County may seek relevant information from the firm, its prior clients or customers, its subcontractors, or any other relevant source.

(d) After the County determines that all responsibility certifications have been properly executed and has verified that all other relevant information submitted in response to the request pursuant to the review process indicate that the prospective awardee and its subcontractors are qualified, responsible firms, it shall issue a written Contractor Responsibility Determination for the prospective awardee.

(e) In the event a firm is determined to be non-responsible, the County shall notify the firm and proceed to conduct a responsibility review of the next lowest, responsive bidder or, if necessary, rebid the project. A Responsibility Determination may be revoked at any time if the County obtains relevant information warranting any such revocation.

§9. False and Misleading Responsibility Certifications

If the County determines that a Contractor Responsibility Certification, Subcontractor List, or Subcontractor Responsibility Certification contains false or misleading material information that was provided knowingly or with reckless disregard for the truth or omits material information knowingly or with reckless disregard of the truth, the firm for which the certification was submitted shall be disqualified from the project and shall be prohibited from performing work for the County for a period of three years. The County may withhold payment of any monies due to the firm as damages and impose other applicable penalties and sanctions, including contract termination, as permitted by law or contract.

§10. Execution of Final Contract

(a) A contract subject to this ordinance shall not be executed until all requirements of this ordinance have been fulfilled and until Contractor Responsibility Determination has been issued by the County under §8(d). Upon completion of all requirements under this ordinance, the County may execute a final contract based upon the Notice of Intent.

(b) Prior to the execution of a final contract under this ordinance, the County shall publicly post the Notice of Intent to Award, Contractor and Subcontractor Responsibility Certifications, Subcontractor Lists, related supporting documentation, and the Contractor Responsibility Determination on the County website for public inspection for a period of five (5) calendar days after the issuance of the Contractor Responsibility Determination.

§11. Effective date

Ordinance 167 ("Responsible Contractor Ordinance Amendments") shall become effective thirty (30) days after enactment.

ORDAINED AND ENACTED this 16th day of March, 2022.

BOARD OF COMMISSIONERS,
BUCKS COUNTY, PENNSYLVANIA

Robert J. Harvie, Jr. (Chair)

Diane Ellis-Marseglia, LCSW (Vice-Chair)

Gene DiGirolamo (Secretary)

Attest:

Gail Humphrey, Chief Clerk

3/18/2022

County of Bucks
Contractor Responsibility Certification Form

Contractor Name:_____ Date:_____, 20___

Contractor Address: _____

_____,_____ Zip Code_____

Contact Name:_____ E-mail_____

Contact Direct Phone No.:_____ Fax No.: _____

Project Name Restoration and Renovation of the Farmhouse for the African American Museum of Bucks County, Spec #39-07/22

Prime Contract: _____
(must fill out a separate form for each Prime Contract you are submitting a bid for)

To be certified, Contractor is required to check all the following boxes:	**Yes**	**No**
1. Does the Contractor and its employees have all valid, effective licenses, registrations or certificates or other credentials required by federal, state, county, or local law, including, but not limited to, licenses, registrations or certificates required to: (a) do business in the designated locale; and (b) perform the contract work it seeks to perform? These shall include, but not be limited to, licenses, registrations or certificates for any type of construction or maintenance trade work or specialty work which the firm proposes to self-perform.	☐	☐
2. Does the Contractor meet the bonding requirements for the contract, as required by applicable law or contract specifications as well as any applicable insurance requirements for the contract including general liability insurance, workers compensation insurance and unemployment insurance?	☐	☐
3. Has the Contractor been debarred or suspended by any federal, state or local government agency or authority in the past three years?	☐	☐
4. Has the Contractor defaulted on any project in the past three years?	☐	☐
5. Has the Contractor had any type of business, contracting or trade license, registration or other certification revoked or suspended in the past three years?	☐	☐
6. Has the Contractor or its principals/owners been convicted of any crime relating to the contracting business in the past 10 years?	☐	☐
7. Has the Contractor within the past three years been found in violation of any law applicable to its contracting business, including, but not limited to, licenses laws, tax laws, prompt payment laws, wage and hour laws, prevailing wage laws, environmental laws or others, where the result of such violation was the payment of a fine, back pay damages or any other type of penalty in the amount of $5,000 or more?	☐	☐

County of Bucks
Contractor Responsibility Certification Form

	Yes	No
8. Does the Contractor employ a sufficient number of craft labor personnel required to successfully perform any project work it self-performs or will the Contractor use qualified subcontractors to meet this requirement and will assign workers to perform only work in their respective craft or trade for which they have sufficient skills and training or shall use qualified subcontractors to meet this requirement?	☐	☐
9. Contractor will pay all craft employees that it employs on the project, at a minimum, the applicable wage and fringe benefit rates, as established for the classificationin which the worker is employed in accordance with 43 PA. CONS. STAT. § 165-1 *et.seq.*	☐	☐
10. All craft labor that will be employed by the Contractor for the project will have completed, prior to working on the project, the OSHA 10-hour training course for safety established by the U.S. Department of Labor. If submitting a bid as a Prime Contractor, Contractor shall ensure that at least one person on the project has completed the OSHA 30-hour contruction course established by th U.S. Department of Labor.	☐	☐
11. The Contractor participates in a Class A Apprenticeship Training Program, as defined below, for each separate trade or classification in which it employs craft employees.	☐	☐
A. For purposes of this section, a Class A Apprenticeship Program is an apprenticeship program that is currently registered with and approved by the U.S. Department of Labor or a state apprenticeship agency and has graduated apprentices to journeyperson status for at least three of the past five years. This may be an apprenticeship program that is subject to the Employee Retirement Income Security Act of 1974, 29 U.S.C. § 1001 *et seq*. (“ERISA”), or a non-ERISA program.	☐	☐
B. To demonstrate compliance with Ordinance 162 and Ordinance 167, the firm shall provide, with this certification, a list of all trades or classifications of craft employees it will employ on the project and documentation verifying it participates in a Class A Apprenticeship Program for each trade or classification listed.	☐	☐
12. The Contractor will ensure that at least 70 percent of the craft labor woekers employed on the project shall be comprised of either journeyperson workers who have successfully completed a Class A Apprenticeship Program as defined in §3(c)11 of Ordinance 167 or apprentices registered in such programs, with the apprenticeship participation required in the same trade or craft for which the wrokers are employed on the project	☐	☐
13. The Contractor shall assign craft labor personnel to work only in the craft or trade in which they are employed.	☐	☐
14. The Contractor has all other technical qualifications and resources, including equipment, personnel and financial resources, to successfully perform the referenced contract and shall maintain such capabilities throughout the duration of the project, or will obtain same through the use of qualified, responsible subcontractors or vendors.	☐	☐

County of Bucks
Contractor Responsibility Certification Form

	Yes	No
15. The Contractor shall notify the County within seven days of any material changes in its operation that are related to any matters attested to in this certification.	☐	☐
16. The firm understands that the Contractor Responsibility Certification required by Ordinance 162 and Ordinance 167 shall be executed by a person who has sufficient knowledge to address all matters in the certification and execution of the Certification shall constitute an attestation, under the penalty of perjury, that the information submitted is true, complete and accurate.	☐	☐

Upon receipt of a Notice of Intent to Award Contract, the Contractor will provide the Owner with subcontractor list and subcontractor information as specified in Ordinance 162 and Ordinance 167.

ATTACH ADDITIONAL SHEETS IF NECESSARY.

Contractors Authorized Representative:

Signature: _____

Title: _____ Date: _____

SECTION 001115

PREQUALIFICATION OF BIDDERS

1.1 NOTIFICATION

A. The County of Bucks seeks a General Construction Contractor with demonstrated experience in historic rehabilitation for conversion of the Historic 1715 Boone Farmhouse for use as the African American Museum of Bucks County. Demonstrated experience shall include examples of projects and client references, that the contractor has managed and executed projects of similar complexity and cost (preferably multi-prime projects), and proof, via examples of work and client references, that contractor has completed projects that required an equal degree of exterior historic rehabilitation.

B. This is a "Core and Shell" project intended to make the existing building and site ready for interior finishes, fit-out and exhibit installation by the user (African American Museum of Bucks County) under a future separate construction contract.

C. Proof of historic experience should be added to the Contractor's Qualification Statement on PennBid.

D. The work will be divided into multiple Prime Construction Contracts as follows:

1. General Building Construction.
2. Mechanical Construction.
3. Electrical Construction.
4. Plumbing and Fire Protection Construction.
5. Elevator Construction

1.2 SCOPE OF WORK FOR GENERAL CONSTRUCTION PRIME CONTRACT

A. General Construction Contract

1. Qualification: Demonstrated experience in historic restoration construction. Evidence, via examples of projects and client references, that the contractor has managed and executed projects of similar complexity and cost (preferably multi-prime projects), and proof, via examples of work and client references, that contractor has completed projects that required an equal degree of exterior historic rehabilitation.
2. Core and Shell rehabilitation of existing farmhouse to its original historic appearance and addition of new elevator, including, but not limited to:
    a. Interior and exterior selective demolition;
    b. Masonry restoration and repointing, cutting new openings in existing masonry;
    c. Rough carpentry
    d. Repairs to existing metal roofs;
    e. Replacement of wood shingle roofs;

f. New roof flashings, gutters, downspouts, and eave vents;

g. Repair/replacement of existing exterior wood trims;

h. New windows in existing masonry openings and new openings;

i. Restoration of existing exterior doors

j. Rehabilitation of existing wood addition;

k. Interior insulation of building envelope

l. Construction and finishing of selected interior elements such as toilet rooms, stairways, elevator lobbies;

m. New exterior pavements and steps at existing porch.

n. Other Core and Shell work as may be shown on the drawings and as specified;

3. Site Construction, including:

a. Site grading;

b. Erosion and sediment control;

c. Storm water management;

d. Site utilities, including domestic water, fire water, sanitary and storm sewer, underground electric service to meter, site lighting and connection to municipal services.

e. Construction of parking lot, driveways, curbs, concrete and asphalt sidewalks, pavement striping and markings

f. Landscaping, including fine grading, trees, shrubs, and seeding.

4. Project Coordination: General Construction contractor will be responsible for coordination of the work of all prime contractors, overall project scheduling, construction conferences, management and processing of all submittals.

END OF SECTION

SECTION 011100

SUMMARY OF WORK

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 GENERAL DESCRIPTION

A. Historic 1715 Boone Farmhouse for use as the African American Museum of Bucks County, located at 867 Newtown-Langhorne Road, Route 413 near Bridgeton Pike, Langhorne, PA 19047, Middletown Township, Bucks County, PA.

1.3 MULTIPLE PRIME CONTRACTS

A. This project includes selective demolition, the construction of a parking lot, curbs, concrete and asphalt sidewalks, pavement striping and markings, site grading, storm water management, erosion and sediment control and associated work. This entire project is subject to the requirements of the Multiprime Law of the State of Pennsylvania. The work is to be bid and completed in the following contracts:

Contract No.1: General Prime Construction. This Contract includes the work of Divisions 01, 02, 03, 04, 06, 07, 08, 09, 31, 32, and 33, overall project scheduling, and coordinating with Contracts 2, 3, 4, and 5. Site work including work in the public rights of way adjoining the site are incorporated into this Contract.

Contract No. 2: Plumbing and Fire Protection. This Contract includes the work of Divisions 01, 21, 22, and 33 sections and coordinating with Contracts 1, 3, 4, and 5.

Contract No. 3: Mechanical, Heating, Air Conditioning and Ventilating. This Contract includes the work of Divisions 01, 23, and 33 sections and coordinating with Contracts 1, 2, 4, and 5.

Contract No. 4: Electrical work. This Contract includes the work of Divisions 01, 26, and 33 sections and coordinating with Contracts 1, 2, 3, and 5.

Contract No. 5: Elevator work. This Contract includes the work of Divisions 01, 14, 26, and 33 sections and coordinating with Contracts 1, 2, 3, and 4.

PART 2 GENERAL ISSUES

2.1 COORDINATION WITH SPECIFICATIONS

A. This document takes precedence over the full-spec for material selection.

B. The full specification, if any, takes precedence for quality control, submission requirements, warranty.

C. The default for specification and material legend overlap is to select for greater quality or greater quantity.

2.2 MANUFACTURER RECOMMENDATIONS

A. Follow manufacturer's application instructions. All materials are to be installed per the manufacturer's recommendations for a quality installation.

2.3 WARRANTY

A. All materials are to be covered by the manufacturer's standard warranty (if any), unless noted otherwise by a more comprehensive warranty as mentioned herein for a particular material.

2.4 NOTIFICATION REQUIRED

A. Report in writing any condition that may affect application or final appearance of the material.

2.5 SUBSTITUTIONS

A. Substitutions will only be considered with just cause such as cost or time savings. Substitutions for convenience or loyalty will not be considered. A full written submission with comparative data must be submitted to the Architect/Engineer and Owner to review for justified acceptance.

2.6 SHOP DRAWINGS

A. Refer to Structural Documents for minimum wind load values.

B. All shop drawings that are engineered by the manufacturer to contain the minimum and proposed design loads.

C. Engineered Shop drawings to include the total assembly and adjacent materials and attachments and fasteners.

D. Engineered Shop drawings and calculations to be signed and sealed by a State licensed engineer as a part of the submission.

PART 3 SUMMARY OF ENERGY CODE MINIMUM EQUIREMENTS & COMPLIANCE, 2020

3.1 COORDINATION, BUILDING ENCLOSURE CD PHASE REPORT

Location:		Middletown Twp, PA
Energy Code:		2015 Energy Code, Zone 4A
Attic Insulation	*Required:*	R38
	Proposed:	Historic. Propose R13ci Historic with between rafter ventilation. When insulation at the attic floor, proposed R21 to R38 (as will fit) of blown-in fiberglass insulation.
Mass Masonry Wall	*Required:*	Walls = R9.5 (Mass with Continuous Insulation)
	Proposed:	Historic. Propose R13ci, Historic, 2” SPF on interior side of stone masonry.
Wood-Framed Walls	*Required:*	R13 + R3.8ci or R20 if singular total.
	Proposed:	Historic. Propose R21ci, 3 1/2" SPF, Class 2VR
Below-Grade Walls	*Required:*	R7.5ci. Full-Height.
	Proposed:	Historic. Propose R10, 2” x 24” of XPS Foundation Insulation.
Floor of Joist/Framing	*Required:*	R30
	Proposed:	Historic. Propose R13, 2” SPF on underside of existing flooring with tempered basement below.

PART 4 WORK COORDINATION AND MOCK-UPS

4.1 REFER PRE-EVALUATION CONFERENCE

A. Upon the project award and after preliminary investigations with the various sub-contractors, schedule a pre-evaluation conference with the Owner or Architect/Engineer to review the approach for scheduling, evaluation, and mock-ups unless otherwise indicated in contract documents or drawings.

4.2 SCHEDULE

A. Each Prime Contractor shall prepare a preliminary comprehensive work sequence and construction schedule within 10 calendar days of Notice to Proceed and submit to the General Construction contractor for coordination and incorporation into an overall schedule. This will include the time of existing evaluation, mock- up, sequence of construction of new work, and sequence of construction of refinishing and re-sealing.

B. The General Construction Contractor shall obtain preliminary schedules of the work of the other Prime Contractors within 10 calendar days of receipt of schedules from the other Prime Contractors and incorporate the schedules of all four Prime Contractors into a unified comprehensive work sequence and construction schedule. The General Construction Contractor shall consult with the other Prime Contractors as necessary in order to prepare the overall schedule.

C. Each Prime Contractor shall approve and sign the completed overall schedule.

4.3 MOCK-UPS

A. Prepare mock-ups of the various required systems. This will include the new work, as well as the re-finishing and the re-glazing. This work should include the necessary adhesion testing for the paints, and the pull tests for the sealants unless otherwise indicated in contract documents or drawings.

B. The Architect is available during this Mock-up phase for review of the field mock-ups and the review of the testing.

C. It is important to emphasize the importance of these early phases prior to the start of Work.

4.4 PRE-CONSTRUCTION CONFERENCE

A. Once the scheduling, evaluation and mock-ups are prepared and approved, schedule a kick-off pre-construction conference. This meeting should include the Contractor, Owner, Architect, and Major Sub- contractors.

B. Subjects for discussion at pre-construction conference shall include site access and parking, security, work hours, electric and water utilities, toilet facilities, coordination of the work, project schedule, submittals, ongoing and final cleanup, project closeout, other subjects as needed.

END OF SECTION

SECTION 010010

SPECIAL PROVISIONS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

A. This contract including selective demolition, the construction of a parking lot, curbs, concrete and asphalt sidewalks, pavement striping and markings, site grading, storm water management, erosion and sediment control, and associated work

1.3 CONTRACT TIME AND COMPLETION DATES

A. The completion date and liquidated damages, as found in the Agreement, shall apply to all work, including Final Restoration, as described in Contractors Work Section.

B. All unit prices bid in the proposal shall remain in effect for the duration of the contract, irrespective of the date of completion.

1.4 STORED MATERIALS AND EQUIPMENT

A. No materials may be stored within the right-of-way of any roadway. All materials must be either stored at a designated staging area, or brought to the site each day, unless written permission to the contrary is granted by the Township.

B. The contractor may not park any rubber-tired equipment, including tri-axle trucks, on adjacent residential streets. All rubber tire equipment must be removed from the street and parked at a designated staging area during all non-working hours (i.e. nights and weekends).

1.5 PEDESTRIAN SAFETY

A. The Contractor shall be fully aware that Core Creek Park is a public park and should anticipate the presence of pedestrians in and around the work site. The Contractor must ensure safe, well-defined precautions are established, set in place, and maintained to protect the public.

B. The Contractor shall be fully aware of the above stipulations and shall take this into consideration when preparing bid. It shall be assumed the bid has been prepared and entered into contract in full contemplation of these stipulations.

1.6 PRE-CONSTRUCTION VIDEO

A. Prior to the commencement of any work or the mobilization of any equipment or materials, the Contractor must obtain the services of a qualified professional to videotape the existing features adjacent to the route of proposed construction activity in accordance with Section 01015. The purpose of this video is to establish the pre-construction conditions of the area, so a determination of the required restoration can be made upon completion of the project.

1.7 DISPOSAL OF MATERIAL

A. The Contractor shall remove and dispose of all excavated material in a legal manner in accordance with all local, State and Federal regulations.

B. Prior to commencement of ANY work, the Contractor must provide the Owner with a letter from the facility or facilities which the Contractor will be using to dispose of the excess material (i.e. soil, concrete, paving, etc.). This letter shall serve as permission to use the property. The letter must indicate the location of the property (or properties), the Owner or Owners, the material being disposed of, and the approximate quantities being disposed.

1.8 PROTECTION OF WORK

A. The Contractor must secure the site during working hours and at the each of each workday.

1.9 PUBLIC UTILITIES

A. The Contractor is required to fully inform himself concerning location of public utilities on, under or over the project which may or may not require removal, resetting, construction, or reconstruction and which may interfere with his operations. He shall be assumed to have prepared his bid and entered into contract in full contemplation of the conditions to be encountered and his responsibility in connection therewith. The Contractor shall use special care in execution of the work in order to avoid interference or damage to any operating utilities. When there is any possibility of such interference or damage, the Contractor shall make satisfactory arrangements with responsible officers or owners of the utilities covering the necessary precautions to be used during the performance of the work by the Contractor. Such arrangements shall be made before work is started and shall be subject to the approval of the Architect/Engineer, which approval will not be considered as releasing the Contractor from any responsibility for acts of himself or his representatives.

B. The Contractor shall note that public utilities may be in close proximity to the proposed work. The Contractor shall be responsible for both protecting these utilities and coordinating with the Owner of the respective utility should relocations be required. This work shall be included within the Contractors bid prices and should be completed at no additional cost to the Owner.

C. The Contractor shall be fully aware of the above stipulations and shall take this into consideration when preparing bid. It shall be assumed the bid has been prepared and entered into contract in full contemplation of these stipulations

1.10 DUST CONTROL

A. The Contractor must provide means to immediately remove all material which is to be discarded. The material must be loaded directly onto the trucks and will not be permitted to be stockpiled for later removal.

B. Every day the Contractor must employ a power broom or street sweeper to remove all residual dirt, stone, and other debris from all paved areas.

C. The cost for all necessary dust control procedures shall be included in the unit price of the various quantities and will not be measured for payment separately.

D. If the contractor fails to perform the necessary procedures, the work will be performed by the County, and all costs incurred by the County deducted from the monies due or become due to the Contractor.

1.11 MAINTENANCE OF STREETS AND WALKS

A. The Contractor shall be required to maintain the existing streets and walks for the duration of the Contract. The streets and walks shall be level and free from any holes, divots, depressions, or other encumbrances that will preclude normal vehicular or pedestrian traffic. All trenches must be temporarily paved each day. Temporary paving shall consist of 2-inches of hot bituminous mix.

B. Should the contractor fail to maintain the streets and walks in a reasonable manner, or respond to County requests for maintenance, the County may retain the services of qualified professionals to remedy the situation to the extent deemed necessary. All monies for such services will then be deducted from payment to the Contractor.

1.12 FAILURE TO PERFORM WORK IN ACCORDANCE WITH SPECIFICATIONS

A. If during the duration of this contract, the contractor fails or refuses to perform work in accordance with the specifications and/or the direction of the Owner or Architect/Engineer, the Owner, may at his discretion, order the contractor to correct the deficient work and may hold the dollar value of such deficient work from any monies due or become due to the contractor until the work is corrected to his satisfaction. If such an instance occurs, the Contractor shall have no claim for extra time and/or money as a result of any circumstances related to the deficient work included but not limited to any delays of future work, delivery of materials or interest earned on the monies withheld.

B. The Contractor shall be fully aware of the above stipulations and shall take this into consideration when preparing bid. It shall be assumed the bid has been prepared and entered into contract in full contemplation of these stipulations.

1.13 ACCESSIBILITY

A. All aspects of this contract shall comply with the previsions of: Architectural Barriers Act of 1968 and Section 504 of the Rehabilitation Act Of 1973; Pa Act 235 Of 1965, as amended; Universal Accessibility Act; and Americans with Disabilities Act (ADA) of 1990, as amended.

1.14 STIPULATIONS

A. The Contractor shall be fully aware of the above stipulations and shall take this into consideration when preparing bid. It shall be assumed the bid has been prepared and entered into contract in full contemplation of these stipulations.

B. Workers are NOT PERMITTED to use permanent toilet room fixtures.

END OF SECTION

SECTION 010100

CONTRACTORS WORK

PART 1 GENERAL

1.1 RESPONSIBILITY OF CONTRACTOR

A. Contractor shall furnish all materials, implements, machinery, equipment, tools, supplies, transportation, labor, and supervision required to construct the facilities as shown on contract drawings and specified herein. It shall be the responsibility of the Contractor to proceed with the work in the manner and within such limitations as may be prescribed by the Architect/Engineers.

1.2 CONSTRUCTION LIMITS

A. Contractor shall confine his operations strictly within the limits of disturbance, indicated by the plans and/or directed by the Architect/Engineer, unless written permission is obtained to occupy additional ground. Upon completion of work the Contractor shall cleanup and restore the area of his operations to a condition at least equal to original conditions. Unless specified elsewhere herein, all restoration shall be included in the Contractor's unit and/or lump sum price bid. Damage to property outside of specified construction limits shall be the responsibility of the Contractor and restoration of same shall be made at the Contractor's expense.

1.3 MEASUREMENT OF WORK AND MATERIALS

A. The Contractor will be paid for the actual quantity of authorized work or material furnished under each item of the contract, at the prices stipulated for each item. If the quantity of any unit price item is decreased the Contractor shall have no claim for damages on the basis of loss of anticipated profits. All quantities of work and materials to be paid will be determined by the Architect/Engineers in accordance with working lines specified in the contract documents.

1.4 CONSTRUCTION SEQUENCE

A. Submit for approval prior to construction a detailed schedule outlining all major activities, including the projected dates for work on each road in each phase. Upon approval, the Contractor shall adhere to this schedule unless written permission to the contrary is given by the Owner.

1.5 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor shall be responsible for all costs, including temporary power, water, telephone, and testing services.

B. The County will obtain and pay for any required permits. However, all inspection fees, if applicable, shall be borne by the Contractor, whether same is billed directly to bidder or to the Owner. Should any such bill be left unpaid by the Contractor, the Owner shall be empowered to pay such bills and the cost thereof deducted from any monies due or to become due the Contractor.

1.6 PROTECTION OF WORK AND PROPERTY

A. Contractor shall protect and maintain existing structures, access to existing businesses and driveways, equipment, and new construction (unless otherwise specified) in an undisturbed condition during the contract period.

B. Contractor shall provide adequate protection for the public, the Owners, and his employees during the contract period. Provide protective devices and equipment for protection of people and property. Protective measures shall comply with the Occupational Safety and Health Administration (OSHA) and other codes having jurisdiction.

C. The Contractor shall provide adequate protection against injury or loss arising in connection with this Contract for all his work and the property of the Owner. Contractor shall make good any such damage, injury, or loss. Contractor shall adequately protect adjacent property as provided by law and the specifications and drawings. Contractor shall provide facilities for protection required by public authority or local conditions as passageways, guard fences, lights, etc.

D. The Contractor shall furnish, erect, place, and maintain traffic control signs and devices and maintain traffic during hours of construction and at all other times in accordance with the methods indicated on the drawings and:

1. The special provisions of the Contract.
2. PA Code, Title 67, Chapter 212, Publication 213, Temporary Traffic Control Guidelines.

(a) Immediately upon completion of the work, remove devices.

(b) All traffic control devices must be in place before work begins.

(c) Access to all adjacent properties must be maintained at all times.

(d) The work area must be properly barricaded and secured during nonwork hours to provide unrestricted full width use for through-traffic lanes.

1.7 CLEAN-UP

A. Each Contractor shall periodically remove waste so that at no time shall there be undue accumulation in the work area. Upon completion of the work, the Contractor shall remove from the project and adjacent property, all surplus and discarded materials, equipment, and temporary structures and leave the premises broom clean.

B. A final cleaning inspection shall be made by the Architect/Engineer. The Contractor shall perform any additional cleaning as required by the Architect/Engineer.

1.8 TIME OF THE ESSENCE

A. Time is of the essence in the performance of the Work required by this Contract. No extensions of time will be granted for rain days, snow days or cold weather.

1.9 COPIES OF DOCUMENTS

A. Furnished Copies: Contractor will be furnished at no cost to him a maximum of 3 sets of full-size Contract Drawings, (in addition to as-built set) including revised drawings, and a maximum of 3 copies of the Contract Specifications in addition to those used in the execution of the Agreement provided by Architect/Engineer unless otherwise indicated in contract documents or drawings.

B. Additional Copies: Additional copies of the above documents will be supplied by the Architect/Engineer with the Contractor paying $50 per additional copy requested unless otherwise indicated in contract documents or drawings.

1.10 RELATED DOCUMENTS

A. The Contractor shall adhere to the rules, regulations, and requirements of all state, county, and local permits and/or approvals issued for this project. Permitting agencies must be notified by the Contractor prior to construction per the requirements of the permits.

1.11 WORK WITHIN PRIVATE PROPERTY RIGHT-OF-WAY

A. The Contractor's construction operations, equipment, materials and any other such items shall not leave the right-of-way without the written permission of the Architect/Engineer.

B. The Contractor shall neither damage nor destroy any trees or shrubs located outside the limit of disturbance. Any trees or shrubs damaged or destroyed that are located outside of the limit of disturbance shall be replaced in kind by the Contractor at no additional cost to the Owner.

C. Contractor shall restore all disturbed areas as specified herein.

1.12 CONSTRUCTION STAKEOUT

A. The Contractor shall perform all construction stakeout required for the installation of the facilities, using the information provided on the drawings.

END OF SECTION

SECTION 010150

PRE-CONSTRUCTION SURVEY

PART 1 GENERAL

1.1 PURPOSE

A. The purpose of this survey is to locate and document all existing conditions, both prior to the commencement of any construction within the area.

1.2 PERSONNEL

A. NOT USED

1.3 TIMING

A. The pre-construction survey shall be conducted after issuance of the notice to proceed. The survey shall be conducted no sooner than 4 working days and no later than 2 working days prior to the commencement of work. No mobilization, deliveries or work of ANY NATURE shall be permitted prior to the pre-construction survey.

PART 2 SITE SURVEYS

2.1 EXTERIOR SURVEY

A. In accordance with the time parameters outlined in Section 1.3, the Contractor must obtain the services of a qualified professional to video tape the existing features adjacent to the route of proposed construction activity. The purpose of this video is to establish the pre-construction conditions of the area, so a determination of the required restoration can be made upon completion of the project.

B. The video shall meet the following minimum requirements:

1. Extent:

(a) As a minimum the video shall extend 75-feet in all directions from the limit of work.

(b) The video shall encompass all intersecting streets for a minimum of 100-feet in all directions.

2. The video shall encompass at the entirety of the park and Newton-Langhorne Road. The video shall show in detail all cartway paving; curbing; sidewalk; walkways; entrances, signs, and all other features on and adjacent to the park.

3. The video shall also show the Contractor's proposed staging area and all surrounding features within 100-feet of the perimeter of the staging area.

4. An audio narrative shall be included outlining in detail a description of the video being taken. This description shall include the location of the video, house number, proximity, and all other information pertinent to fully describing the object and ascertaining its location and existing condition.

PART 3 EXECUTION

3.1 GENERAL

A. All videos shall be high quality (HQ) color digital video discs.

B. All film employed for still pictures shall be a high quality type. All pictures shall be a minimum 4-inch x 6-inch size.

C. All documentation shall be clear and legible. All designations shall be clearly identified with dimensions to a minimum of two (2) fixed reference points. Also a clear and concise description shall be provided for each condition encountered indicating the precise nature, dimensions, location, and situation encountered.

D. All documentation shall be clearly identified with the following information:

- Contract Number and Title
- Business Address and Location
- Specific location identified
- Date and time survey was conducted.

E. Two (2) copies of all documentation shall be provided to the Architect/Engineer for review at least two (2) working days prior to the commencement of construction as indicated in contract documents and drawings.

END OF SECTION

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SECTION 013100

CONSTRUCTION SCHEDULES

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

A. Promptly after the effective date of the Agreement, prepare and submit to Architect/Engineer estimated construction progress schedules for the Work, with sub-schedules of related activities which are essential to its progress.

B. Submit schedule in accordance with contract documents and drawings.

C. Submit revised progress schedules should any significant changes transpire within the schedule and; or at the request of the Architect/Engineer, General Prime Contractor, and/or Owner.

1.2 RELATED REQUIREMENTS

A. Section 010100 - Contractors Work

B. Section 017000 - Project Closeout

C. Section 013400 - Shop Drawings, Product Data, and Samples

1.3 FORM OF SCHEDULES

A. Prepare schedules in the form of a horizontal bar chart.

1. Provide separate horizontal bar for each trade or operation.

2. Horizontal time scale: Identify the first workday of each week.

3. Scale and spacing: To allow space for notations and future revisions.

4. Minimum sheet size: 8-1/2" x 11".

B. Format of listings: The chronological order of the start of each item of Work.

C. Identification of listings: By specification section number and name.

1.4 CONTENT OF SCHEDULES

A. Construction Progress Schedule:

1. Show the complete sequence of construction by activity.
2. Show the dates for the beginning, and completion of, each major element of construction.

B. Submittals Schedule for Shop Drawings, Product Data, and Samples. Show:

1. The dates for Contractor's submittals.
2. The dates approved submittals will be required from the Architect/Engineer.

1.5 PROGRESS REVISIONS

A. Indicate progress of each activity to date of submission.

B. Show changes occurring since previous submission of schedule:

1. Major changes in scope
2. Activities modified since previous submission
3. Revised projections of progress and completion
4. Other identifiable changes

C. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and the impact on the schedule.
2. Corrective action recommended and its effect.
3. The effect of changes on schedules of contractor.

1.6 SUBMISSIONS

A. Each prime contractor shall submit to General Construction Contractor initial schedules within ten days calendar days after the notice to proceed.

1. General Construction Contractor shall, within ten calendar days of receipt of other prime contractors' schedules, consolidate individual schedules into a single coordinated consolidated schedule for review and approval by all Prime Contractors, and submit consolidated schedule to Architect/Engineer in digital format for review.

2. Architect/Engineer will review schedules and return review copy within 10 days after receipt.

3. If required, reissue within 7 days after return of review copy.

B. Submit revised progress schedules with each application for payment.

1.7 DISTRIBUTION

A. Distribute copies of the relevant schedules to:

1. Job site file.

2. Subcontractors.

3. Other concerned parties.

B. Instruct recipients to report promptly to the Contractor, in writing, any problems anticipated by the projections shown in the schedules.

END OF SECTION

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SECTION 013400

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Submit Shop Drawings, Product Data, and Instruction Manuals required by Contract Documents.

1.2 RELATED REQUIREMENTS

A. Definitions, and Additional Responsibilities of Parties: Conditions of the Contract.

1.3 SHOP DRAWINGS

A. Drawings shall be presented in a clear and thorough manner.

1. Details shall be identified by reference to sheet and detail, shown on Contract Drawings.

1.4 PRODUCT DATA

A. Preparation

1. Clearly mark submission to identify pertinent products or models.
2. Show performance characteristics and capacities.
3. Show dimensions and clearances required.

1.5 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor.

B. Number of Submittals Required:

1. Shop Drawings: Submit four (4) copies.
2. Product Data: Submit four (4) copies.

C. Submittals Shall Contain:

1. The date of submission and the dates of any previous submissions.
2. The Project title and contract number.
3. The names of:
    a. Contractor.
    b. Supplier.
    c. Manufacturer.
4. Identification of the product, with the specification section number.
5. Applicable standards, such as ASTM or Federal Specification numbers.
6. Identification of deviations from Contract Documents.
7. Identification of revisions on resubmittals.
8. An 8 in. x 3 in. blank space for Contractor and Architect/Engineer stamps.
9. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work and of Contract Documents.

1.6 RESUBMISSION REQUIREMENTS

A. Make any corrections or changes in the submittals required by the Architect/Engineer and resubmit until approved.

B. Shop Drawings and Product Data:

1. Revise initial drawings or data and resubmit as specified for the initial submittal.
2. Indicate any changes which have been made other than those previously noted by the Architect/Engineer.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

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SECTION 015639

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Requirements:
1. Section 311100 “Site Clearing” for removing existing trees and shrubs.

1.3 DEFINITIONS

A. Caliper (DBH): Diameter breast height; diameter of a trunk as measured by a diameter tape at a height 54 inches (1372 mm) above the ground line**.**

B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated defined by a circle concentric with each tree with a radius 12 times the tree's caliper size and with a minimum radius of 96 inches (2400 mm) unless otherwise indicated.

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site.

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

a. Tree-service firm's personnel, and equipment needed to make progress and avoid delays.
b. Arborist's responsibilities.
c. Quality-control program.

d. Coordination of Work and equipment movement with the locations of protection zones.
e. Trenching by hand or with air spade within protection zones.
f. Field quality control.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones.
2. Detail fabrication and assembly of protection-zone fencing and signage.
3. Indicate extent of trenching by hand or with air spade within protection zones.

C. Samples: For each type of the following:
1. Organic Mulch: 1-quart (1-L) volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
2. Protection-Zone Fencing: Assembled Samples of manufacturer's standard size made from full-size components
3. Protection-Zone Signage: Full-size Samples of each size and text, ready for installation.

D. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1. Species and size of tree.
2. Location on site plan. Include unique identifier for each.
3. Reason for pruning.
4. Description of pruning to be performed.
5. Description of maintenance following pruning.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For arborist and tree service firm.

B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or video recordings.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

E. Quality-control program.

1.7 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA, Certified Arborist-Municipal Specialist as certified by ISA, Licensed arborist in jurisdiction where Project is located, Current member of ASCA or Registered Consulting Arborist as designated by ASCA.

B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.

C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection zone fencing and signage, the arborists and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.8 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Moving or parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill Soil: Stockpiled soil from location shown on Drawings, Stockpiled soil mixed with planting soil, planting soil of suitable moisture content and granular texture for placing around

tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth as shown on Drawings.

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, as shown on Drawings.

C. Protection-Zone Fencing: Fencing fixed in position and meeting one of the following requirements: Previously used materials may be used when approved by Architect.

1. Chain-Link Protection-Zone Fencing: Galvanized-steel, Polymer-coated steel or Polymer-coated galvanized-steel, fencing fabricated from minimum 2-inch (50-mm) opening, 0.148-inch- (3.76-mm-) diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch- (60-mm-) OD line posts, and 2-7/8-inch- (73-mm-) OD corner and pull posts; with 1-5/8-inch- (42-mm-) OD top rails, with 0.177-inch- (4.5-mm-) diameter top tension wire, and 0.177-inch- (4.5-mm-) diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system as shown on Drawings.

2. Wood Protection-Zone Fencing: Constructed of two 2-by-4-inch (50-by-100-mm) horizontal rails, with 4-by-4-inch (100-by-100-mm) preservative-treated wood posts spaced not more than 96 inches (2400 mm) apart, and lower rail set halfway between top rail and ground.

3. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch (50-mm) maximum opening in pattern and weighing a minimum of 0.4 lb./ft. (0.6 kg/m); remaining flexible from minus 60 to plus 200 deg F (minus 16 to plus 93 deg C); inert to most chemicals and acids; minimum tensile yield strength of 2000 psi (13.8 MPa) and ultimate tensile strength of 2680 psi (18.5 MPa); secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches (2400 mm) apart.

4. Gates: Swing access gates matching material and appearance of fencing as indicated on Drawings, to allow for maintenance activities within protection zones; leaf width as indicated on Drawings.

D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading Text, Lettering and Size,: As shown on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain, or to be relocated. Flag, Tie as each tree trunk at 54 inches (1372 mm) above the ground as shown in Drawings

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.

3.3 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones, before materials or equipment are brought on the site and construction operations begin, in a manner that will prevent people, and animals, from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Chain-Link Fencing: Install to comply with ASTM F567 and with manufacturer's written instructions.
2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.
3. Access Gates: Install, where indicated in Drawings, ; adjust to operate smoothly, easily, and quietly; free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect. Install one sign spaced accordingly as shown in Drawings on protection-zone fencing, but no fewer than four signs with each facing a different direction.

C. Maintain protection zones free of weeds and trash.

D. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete, and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements Section 312000 "Earth Moving" unless otherwise indicated on Drawings.

B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow tine spading forks to comb soil and expose roots.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches (75 mm) back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as shown on Drawings.

B. Root Pruning at Edge of Protection Zone: Prune tree roots as shown on Drawings outside, inside, and flush with the edge of the protection zone by cleanly cutting all roots to the depth of the required excavation.

C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.6 CROWN PRUNING

A. Prune branches that are affected by temporary and permanent construction. Prune branches as shown on Drawings or as directed by arborist.

1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
3. Pruning Standards: Prune trees according to ANSI A300 (Part 1) and as indicated on Drawings.

a. Type of Pruning: Cleaning, raising, reducing, and, thinning, where indicated.
b. Specialty Pruning: Structural, restoration, vista, espalier, pollarding, palm, and utility where indicated in Drawings**.**

B. Unless otherwise directed by arborist and acceptable to Architect, do not cut tree leaders.

C. Cut branches with sharp pruning instruments; do not break or chop.

D. Do not paint or apply sealants to wounds.

E. Provide subsequent maintenance pruning during Contract period as recommended by arborist.

F. Chip removed branches and spread over areas identified in Drawings.

3.7 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.

1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.

C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

D. Minor Fill within Protection Zone: Where existing grade is **2** inches (50 mm) or less below elevation of finish grade, fill with backfill soil. Unless otherwise noted on Drawings. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.8 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.9 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Trees: Remove and replace trees indicated to remain that are more than 66 percent dead or in an unhealthy condition than the percentage indicated in Drawing's before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Small Trees: Provide new trees of same size and species as those being replaced for **as** indicated in Drawings.

2. Large Trees: Provide new tree(s) for each tree being replaced as indicated in Drawings.
   a. Species: As selected by Architect.

3. Plant and maintain new trees as specified in Section 329300 "Plants."

C. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds the amount and uniform thickness to remain as shown in Drawings.

D. Soil Aeration: Where directed by Architect, aerate surface soil compacted during construction. Aerate 10 feet (3 m) beyond drip line and no closer than 36 inches (900 mm) to tree trunk. Drill 2-inch- (50-mm-) diameter holes a minimum of 12 inches (300 mm) deep at 24 inches (600 mm) o.c. Backfill holes with an equal mix of augered soil and sand.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION

SECTION 017000

PROJECT CLOSEOUT

PART 1 GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Project Record Documents - Section 017200.

1.2 SUBSTANTIAL COMPLETION

A. When the work is considered substantially complete, submit a written notice that the Work, or a designated portion thereof, is substantially complete. Include a list of all items that require completion or correction.

B. Within a reasonable time after receipt of such notice, an observation will be made to determine the status of completion.

C. If the Work is not considered substantially complete, the Contractor will be notified in writing, giving the reasons therefor.

D. Contractor shall remedy the deficiencies in the Work and send a second written notice of substantial completion. This notice shall include a statement of action taken on each item noted a requiring correction or completion to achieve "Substantial Completion" status.

E. The Work will be observed a second time.

F. When the Architect/Engineer concurs that the Work is substantially complete, he will:

1. Issue a letter accompanied by Contractor's list of items to be completed or corrected, as verified, and amended by the Architect/Engineer.

1.3 FINAL OBSERVATION

A. When the Work is considered complete, submit written certification that:

1. Contract Documents have been reviewed.

2. Work has been observed and has been completed in compliance with Contract Documents.

3. Equipment and systems have been tested in the presence of the Engineer and are operational.

4. Work is ready for final observation.

B. Observation will be made to verify the status of completion with reasonable promptness after receipt of such certification.

C. If the Work is not considered complete, the Contractor will be notified in writing, listing the incomplete or defective work.

D. Contractor shall take immediate steps to remedy the stated deficiencies and, after correcting deficiencies, he shall send a second written certificate that the work is complete. This certification shall itemize each deficiency noted and a statement of action taken to remedy or complete the Work.

E. The work will be observed a second time.

F. When the Work is acceptable under the Contract Documents, the Contractor shall be required to make closeout submittals.

1.4 SECOND OBSERVATION FEES

A. Should the Architect/Engineer perform a second observation due to failure of the work to comply with the claims of status of completion made by the Contractor:

1. Architect/Engineer will deduct the amount of such compensation from the final payment to the Contractor.

1.5 CLOSEOUT SUBMITTALS

A. Project Record documents are specified under Section 017200 unless otherwise indicated in contract documents or drawings.

1.6 SPARE PARTS AND MAINTENANCE MATERIALS

A. Furnish spare parts and maintenance materials as specified under various Sections of the Specifications.

B. Package and label parts and materials and store in area of the building where directed by the Architect/Engineer.

1.7 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final statement of accounting.

B. Statement shall reflect all adjustments to the Contract Sum:

1. The original Contract Sum.
2. Additions and deductions resulting from:
    a. Previous Change Orders.
    b. Allowances.
    c. Unit Prices.
    d. Deductions for uncorrected Work.
    e. Deductions for reinspection payments.
    f. Other adjustments.
3. Total Contract Sum, as adjusted.
4. Previous payments.
5. Sum remaining due.

C. The Architect/Engineer will prepare a final Change Order, reflecting approved adjustments to the Contract sum which were not previously made by Change Orders.

1.8 FINAL APPLICATION FOR PAYMENT

A. Submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contracts.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 017200

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 MAINTENANCE OF DOCUMENTS

A. Maintain at job site, one copy of record documents including Drawings, Specification, Amendments, Change Orders and other modifications, Shop Drawings, product date and samples.

B. In addition, maintain one copy of field orders or written instructions and field test records.

C. Provide files and racks for storage documents.

D. File documents and samples in accordance with Data Filing Format of the Construction Specifications Institute (C.S.I).

E. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

F. Make Documents and samples available at all times for inspection.

1.2 RECORDING

A. Label each document "Project Record" in neat large letters.

B. Record information concurrently with construction progress.

C. Do not conceal any work until required information is recorded.

D. Drawings - Legibly mark to record actual construction:

1. Depths of various elements of foundation in relation to finish first floor datum.

2. Horizontal and vertical locations of laterals, underground utilities, and appurtenances, referenced to permanent surface improvements.

3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

4. Field changes of dimension and detail.

5. Changes made by Supplemental Instruction or by Change Order.

6. Details not on original Contract Drawings.

E. Specifications and Amendments - Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number, and Supplier of each Product and item of equipment actually installed.

2. Changes made by Supplemental Instructions or by Change Order.

F. Shop Drawings - Maintain as record documents. Legibly annotate any changes made after review.

1.3 SUBMITTALS

A. At completion of the Work, furnish one set of drawings showing all notations specified above. A copy of the Design Professional's drawings may be used for this purpose upon reimbursement of the printing costs to the Design Professional. In addition, furnish two copies of any shop drawings or product data sheet which required annotation after approval.

B. After inclusion of additional data, if any, furnish:

1. One set of contract drawings as specified under 1.3, A. above.

2. Two sets of all other Project Record Documents.

Accompany this final submittal with transmittal letter containing data, project title and number, Contractor's name and address, title and number of each Record Document, certification that each document as submitted as complete and accurate, signature of Contractor or his authorized representative.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 020100

MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION

PART 1 GENERAL

1.1 WORK INCLUDED

A. Maintenance and protection of traffic during construction. This work includes but is not limited to providing satisfactory barricades, safety fence, warning signs, detour signs, flashers, traffic cones, flagmen, pedestrian walks, temporary decking and all materials, equipment and labor necessary for the acceptable maintenance and protection of traffic as indicated on sheet CS-0003, and as outlined in PennDOT Publication 213, entitled “Temporary Traffic Control Guidelines” or as directed by the Engineer.

1.2 SUBMITTALS

A. Contractor shall submit a detailed maintenance and protection of traffic plan prepared and sealed by a registered professional engineer. Plan shall provide accurate locations, types and/or sizes for all signage, detour routes, barriers, flagman, lights, flashers, cones, construction vehicles, work area, safety fence and all other items required to meet PennDOT specifications.

1.3 GENERAL REQUIREMENTS

A. The Contractor shall maintain vehicular and pedestrian access to adjacent properties at all times during construction, unless otherwise authorized.

B. The contractor shall monitor parking of construction personnel's vehicles and maintain vehicular access to and through parking areas.

C. The contractor shall prevent parking on or adjacent to access roads or in non-designated areas.

D. The Contractor shall maintain access for emergency vehicles at all times during construction.

E. All fire hydrants, water valves, fire alarm boxes and letter boxes shall be left uncovered and readily accessible for use.

F. The Contractor shall furnish, place, maintain and remove steel plates for temporary decking over excavations as indicated and directed. The decking shall be of sufficient strength and shall be installed so as to safely support H-20 loading.

G. Where permission for detouring traffic is granted, the Contractor shall post detour signs to the satisfaction of the appropriate Authorities, and the Contractor shall maintain such detour routes until such time as they are deemed unnecessary by the appropriate Authority.

H. No State Highway may be closed to traffic without State approval.

I. No municipal roadway may be closed to traffic without the municipality's approval.

J. Contractor shall provide an adequate number of flagmen as required or as directed by the Engineer.

K. The Contractor shall be responsible for notifying the Township Police, Bucks County Emergency Communications Department, School Districts, and Fire Departments when it is necessary to close any roadway 24 hours prior to road closure.

L. Maintenance and protection of traffic during construction shall conform to Title 67 PA Code, Chapter 212, Publication 213 entitled “Temporary Traffic Control Guidelines”.

1.4 SPECIAL REQUIREMENTS

A. The work area shall be properly barricaded and secured during non-work hours to provide unrestricted full width use for through traffic lanes.

B. During working hours, the Contractor shall provide a minimum of one (1) twelve (12) foot wide lane through the work area for through traffic. Proper signage, barricades and flagmen shall be provided as necessary to facilitate traffic flow as necessary, or as directed by the Engineer or County.

C. The Engineer shall have the authority, upon proper written notice to the Contractor, to stop construction progress until such time when all deficiencies have been corrected to the satisfaction of the Engineer, if in the opinion of the Engineer traffic control is inadequate thereby creating a safety hazard. In such instance, the Contractor shall have no claim for extra compensation or increase to the contract time for such disturbances.

END OF SECTION

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SECTION 021200

SOIL EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of soil erosion and sediment control work is shown on the drawings. Soil erosion and sediment control includes but is not limited to:

1. Silt Fences.
2. Rock Filters.
3. Temporary Seeding.
4. Temporary Mulching.
5. Excavation.
6. Maintenance and Removal of All Sediment and Erosion Control Measures.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Turf and Grasses - Section 029300

1.3 REFERENCE STANDARDS

A. Pennsylvania Department of Environmental Protection (DEP) "Erosion and Sediment Pollution Control Program Manual", latest edition.

B. Pennsylvania Department of Environmental Protection (DEP) "Special Protection Waters Implementation Handbook", latest edition.

C. Pennsylvania Department of Transportation (PennDOT) Publication 408, "Specifications", latest edition.

1.4 CONSTRUCTION SEQUENCE

A. Operations

1. Temporary control measures shall be used to eliminate or minimize soil erosion during construction by installing inlet protection, silt fence, rock filters, and stabilized construction entrances as indicated on the plans.

2. Silt fence shown on the plans shall be used to intercept runoff sedimentation before it leaves the site.
3. Permanent control measures will be accomplished by paving, seeding and sodding exposed soil. The location and details of permanent facilities are shown on the plans.
4. Work shall not commence until appropriate erosion control devices are in place. All permanent erosion control features shall be incorporated into the project at the earliest practicable time. Should seasonal limitations make such coordination of permanent installations impractical, temporary erosion control measures shall be taken immediately to the extent feasible.
5. Where erosion is likely to be a problem, limited clearing and grubbing operations should be scheduled and performed so that grading operations and permanent features can follow immediately thereafter if conditions permit.

B. Maintenance

1. Maintenance of the erosion and sedimentation control facilities will include the inspection of the facilities after each storm and on a periodic basis. Immediately after a storm event, erosion and sedimentation control facilities will be cleaned, repaired and replaced as needed. Washed out areas will be regraded, topsoiled and reseeded. Silt fences will be inspected and restored to an upright and effective position after storms or when they are observed to be in need of maintenance.

C. Schedule

1. Conform to construction sequence on drawings.

PART 2 - PRODUCTS

2.1 Suitable soil materials are defined as those complying with ASTM D2487 soil classification Groups ML, GW, GP, GM, SW, SM and SP. Suitable soil materials shall consist of residual soils and/or decomposed rock obtained from required on site excavations. Suitable soil materials shall be free of organic matter, ice, snow, and shall not contain rock fragments greater than six (6") inches in diameter.

2.2 Seed shall be in conformance with the specifications on the drawings.

2.3 Mulch shall conform to Section 805.2(a) of the PennDOT specifications.

2.4 Rock, slag, or gravel for construction entrance shall conform to PennDOT Section 703.2, Type A or Type C, AASHTO gradation No. 1.

2.5 Silt barrier fence shall meet the requirement of PennDOT Section 865.2 and the details shown on the plans. Silt barrier fences shall be supplied with posts.

PART 3 - EXECUTION

3.1 All soil erosion and sediment control work shall be performed at the locations called for on the plans or where directed in the field by the Engineer.

3.2 Temporary Seeding

A. Temporary seeding shall be done in areas where no active work will be performed for 3 days.

B. Seeding - Temporary seeding shall be in conformance with the drawings.

3.3 Mulching shall be as follows:

A. Materials - Straw - air dried and free from undesirable seeds and coarse materials.

B. Application - as specified on the drawings.

C. Mulch Anchoring - Conform to requirements of Section 805.3 of the PennDOT specifications.

D. Maintenance

1. Mulched areas shall be checked periodically and immediately after severe storms for damage, until the mulching is no longer necessary for protection against erosion. Damaged portions of the mulch and tie down material shall be repaired as soon as discovered.
2. Where seed is not applied, mulching at 135 lbs. per 1,000 sq. feet may be used for temporary erosion control.

3.4 Plan Coordination

A. Incorporate the project's permanent erosion control features into the project at the earliest possible time. Perform and schedule clearing and grubbing operations in ways that allow permanent erosion control features to follow as soon as possible. If construction phasing does not permit Contractor to meet clearing and grading limitations, temporarily seed and mulch as required.

B. Seed and mulch to temporarily stabilize potential erosion areas in conformance with the requirements of Section 804.3 and 805.3(a) of the PennDOT specifications except that tillage, soil supplements, and rolling are not required.

C. Comply with the requirements of the Pennsylvania Department of Environmental Protection; Title 25, Part 1, Sub-Part C, Article 1f, Chapter 102, Rules and Regulations. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, State, or local agencies, the more restrictive laws, rules, regulations, plan requirements or permit conditions apply.

D. Maintain all sediment and erosion control facilities as required to assure their effective and continued operation.

E. Install silt barrier fences in accordance with PennDOT Section 865.3.

F. Completely remove all temporary sediment and erosion control measures at the completion of construction. Restore all disturbed areas to the satisfaction of the Engineer.

3.5 Schedule and conduct operations to minimize erosion of soils and to prevent silting and muddying of streams, rivers, storm sewers, irrigation systems and impoundments (reservoirs, etc.). Construct drainage facilities and other contract work, which will contribute to the control of erosion and sedimentation, in conjunction with earthwork operations or as soon thereafter as practicable. The area of bare soil exposed at any one time by construction operations shall be kept to a minimum.

3.6 Prior to suspension of construction operations for appreciable lengths of time, shape the earthwork in a manner that will permit storm runoff with a minimum of erosion. Provide and maintain temporary erosion and sediment control measures such as berms, dikes, slope drains, or sedimentation basins deemed necessary by the Engineer until permanent drainage facilities and erosion control features are completed and operative. Temporary erosion control measure will not be paid for directly, but will be considered as a subsidiary obligation of the Contractor covered under the various contract items of work.

3.7 When borrow material is obtained from other than commercially operated sources, control erosion of the borrow site, both during and after completion of the work, so that erosion will be minimized and sediment will not enter streams or other bodies of water. Locate and construct waste or disposal areas and construction roads in a manner that will keep sediment from entering streams.

3.8 Unprotected fording of live streams will not be permitted. Provide stream linings, temporary bridges, or other structures as shown on the drawings wherever stream crossings

are necessary. Do not operate mechanized equipment in live streams unless otherwise approved in writing by the Engineer.

3.9 When work or gravel pits are located in or adjacent to live streams, separate such areas from the main stream by a dike or other barrier to keep sediment from entering a flowing stream. Take care during the construction and removal of such barriers to minimize the muddying of a stream.

3.10 Clear all waterways of falsework, piling, debris or other obstructions not a part of the finished work as soon practicable.

3.11 Treat water from aggregate washing or other water containing sediment by filtration, a settling basin or other means sufficient to reduce the sediment content to not more than that of the stream into which it is discharged.

3.12 Do not discharge pollutants such as fuels, lubricants, bitumens, raw sewage and other harmful materials into or near rivers, streams and impoundments or into natural or manmade channels leading thereto. Do not allow wash water or waste from concrete mixing operations to enter live streams.

3.13 Comply with all applicable regulations of fish and wildlife agencies and statutes relating to the prevention and abatement of pollution.

3.14 Temporarily seed any area that is disturbed and is to be left bare for 3 days or more. Mulch such areas, if construction takes place during the winter months when it is impossible to seed. Temporarily seed or mulch within 3 days of the time the area is disturbed.

3.15 Do not leave drainage ways blocked overnight with temporary crossings or other temporary structures, if this blockage could cause siltation down stream or flooding to adjacent property. Restore all drainage ways to existing conditions or as shown on the drawings.

3.16 The Engineer will inform the Contractor of unsatisfactory erosion and water pollution control procedures insofar as erosion and control are concerned. If the unsatisfactory construction procedures and operations are not corrected promptly, the Engineer may suspend the performance of other construction until the unsatisfactory condition has been corrected. There will not be any adjustment of contract time for such suspension of work.

END OF SECTION

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SECTION 022210

UTILITY EXCAVATION, BACKFILL AND COMPACTION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Furnish all labor, materials and equipment to do all clearing of work areas, excavation to the depth shown and/or indicated, support of utilities, maintenance of excavation, removal of all water, backfilling, additional fill, disposal of excess fill, grading, compaction and all incidental work to complete earthwork for utility construction as shown on drawings, as specified and/or as directed by the Engineer.

B. All excavation shall be unclassified and shall include all materials excavated regardless of character. No specific payment will be made for excavation. The prices bid for the respective items shall include all excavation and backfill. Excavation shall be in open cut, unless written permission is given by the Engineer to excavate by other methods. The Engineer shall be empowered to require under special circumstances (such as fragile utilities nearby) that hand excavation and backfill be employed within reasonable limits and accepted construction practices, and that no extra compensation will be allowed the contractor for the hand excavation. It shall be the responsibility of the contractor to plan the trench work to avoid conflicts, obstructions, etc.

C. All work shall be in accordance with OSHA Safety and Health Standards (29CFR 1910), Revised July 1, 1989, or latest revision.

1.2 REFERENCE STANDARDS

A. Pennsylvania Department of Transportation (PennDOT) Publication 408, Specifications latest edition.

B. American Society for Testing and Materials (ASTM)

D1556 Density of Soil in Place by the Sand Cone Method

D1557 Moisture - Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb. Rammer and 18 in. Drop.

D2922 Density of Soil and Soil Aggregate in Place by Nuclear Methods

D3017 Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods

C. OSHA Safety and Health Standards (29CFR 1910), Revised July 1, 1989.

1.3 QUALITY ASSURANCE

A. The services of qualified inspection and testing agencies shall be used for this work.

1.4 BLASTING (DELETED)

1.5 ACCOMMODATION OF TRAFFIC

A. The Contractor shall, where required, maintain roads open for traffic with satisfactory barricades, warning signs and lights. Where permission for detouring traffic is granted, the Contractor shall post detour signs, to satisfaction of the Authorities, the Contractor shall maintain such detour routes. During progress of the work, sidewalks and crossings shall be kept open for passage of pedestrians, unless otherwise authorized.

B. The Contractor shall furnish, place and maintain safety fence around all excavations and other areas designated by the Engineer during non-work hours. Safety fencing shall be the product of Tenax Corporation, bright orange, no less than five feet in height, or approved equal.

C. All excavated and backfill material shall be completely removed from the site at the end of each work day. In no instance shall excavated and backfill material be stockpiled within the County right-of-way or on private property unless written permission is given by the Engineer.

D. The Contractor shall make every effort to clean up the work area at the end of each work day. A power broom shall be used to remove dirt and debris from the roadway.

E. The Contractor shall construct and maintain, without compensation, adequate and approved bridges over excavations as may be necessary or directed by the Engineer for purpose of accommodating pedestrians or vehicles.

F. All fire hydrants, water valves, and fire alarm boxes shall be left uncovered and readily accessible for use.

1.6 PROTECTION OF PROPERTY AND STRUCTURES

A. The Contractor shall at his own expense, sustain in their places and protect from direct or indirect injury, all pipes, conduits, poles, tracks, walls, buildings, pavement, guiderails, driveways, curb, street signs, sidewalks, lawns, fields, mailboxes, shrubs, bushes, plantings, and other structures or property in vicinity of his work, whether above or below ground. He shall replace any pipe, if in the opinion of the Engineer, it is a functioning pipe. Contractor shall restore, at his own expense, any existing property damaged by construction activity. Restoration, when complete, shall render the disturbed area equal to or better than its original condition prior to construction.

B. The Contractor shall have sufficient sheeting or shoring available for supporting his excavations and for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened or weakened.

1.7 OBSTRUCTION SHOWN ON DRAWINGS

A. When the drawings show information in addition to structures and systems to be built, such as locations of pipes, conduits and other structures which exist along lines of work below and/or above the surface of the ground, said information is shown for the convenience of the Contractor who must verify in advance the information given to his own satisfaction.

1.8 REMOVAL AND STORAGE OF SURFACE MATERIALS

A. The Contractor shall grub and clear surface and remove all surface materials, of whatever nature, over line of trench and site of other structures; and he shall properly store, guard and preserve such of said materials as may be required for use in backfilling, resurfacing, repaving, or for other purposes. All curb, gutter, sidewalk and all paving material which may be removed, together with all materials taken from trenches, may be stored in such parts of the roadway or such other suitable place as shall be approved and directed. However said material must be removed from the roadway at the end of each day. The Contractor shall be responsible for any loss of or damage to curb, gutter, sidewalk, flagstones, paving material, grass and plantings through their careless removal or neglectful or wasteful storage, disposal or use.

B. The Contractor shall have no claim for extra compensation for removal of trees or for excavation by hand or tunnel in vicinity of trees that may be left standing.

1.9 WORK IN COUNTY ROADS

A. The Contractor shall remove paving to the maximum allowable trench width, only, as is necessary for the excavation of the trench, and in cases where he removes paving for a greater width than is necessary, or in case where he removes or disturbs or damages any paving outside the maximum allowable trench width, the Contractor will repair or replace the paving per the specifications and the Contractor shall have no claim for extra compensation for this work.

B. For roadway excavation or rehabilitation, full depth saw cutting shall be employed for removal of existing pavement to neat lines. Saw cutting shall be completed twice; once to complete installation of the pipe and appurtenances, and a second time to provide the specified paving cutback.

1.0 OBSTRUCTIONS AND MAINTENANCE OF SERVICES

A. Any work on poles, pipes, conduits or other structures belonging to utility companies that the County agrees that they are in direct conflict with the proposed facilities specified herein and requires removal, realignment or change, because of work to be done under the contract, will be done as an extra, or by the Owner of the structure without costs to the Contractor. However, the Contractor shall be required to relocate any residential utility services in conflict with the proposed facilities and adjust any valve boxes for paving or grading and work around utility poles and underground utilities, pipes, conduits or other structures which are not in direct conflict with the work. Residential utility service relocations shall be performed at no additional cost to the Owner. The Contractor shall arrange with all utility companies for any relocation, temporary removal and restoration of their facilities when required for prosecution of work. However, the Contractor shall uncover and support said structures within the limits of his trench and shall not be entitled to any claim for damage or extra compensation because of said structure or because of any delay in removal or rearrangement of same.

B. There shall be maintained at all times a continuous flow in all existing gas, water, sewer, conduit, electric power, and telephone lines, or any other pipes or structures encountered in prosecution of work under this project, whether above or below ground surfaces.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Definitions:

1. Suitable soil materials are defined as those complying with unified soil classification system soil classification Groups GW, GP, GM, SW, SM and SP. Suitable soil materials shall consist of residual soils and/or decomposed rock obtained from required on site excavations. Suitable soil materials shall be free of organic matter, ice, snow, and shall not contain rock fragments greater than six (6) inches in diameter.
2. Unsatisfactory Soil Materials: Unsatisfactory soil materials are defined as those in the Unified Soil Classification System classes GC, SC, ML, CL, OL, MH, CH, OH and PT, and other highly organic soils.

2.2 No ashes, decomposable refuse, large stones, or other material of an unsatisfactory character shall be used in backfilling. All satisfactory excess material from trenches and other excavations in the contract shall be used and all costs for placement shall be included in the price bid.

2.3 In the event that additional material is needed, the Contractor shall obtain borrow material from other sources. All borrowed material shall be of satisfactory quality for required purposes. In certain locations, grading and filling of adjacent ground may be required or directed by the Engineer. Payment for furnishing and placing borrowed material shall be included in prices bid.

PART 3 EXECUTION

3.1 TRENCHING

A. Trench Width and Depth:

1. Trenches shall be excavated to necessary width and depth, as specified herein or as directed. Where sheeting is used the maximum width below top of pipe shall be measured between interior faces of sheeting as driven, but in no case shall stringers or waling-strips be so placed as to interfere with proper ramming of earth under and around pipe.
2. If sheeting does not extend below a point six (6) inches above pipe as laid, the maximum width allowed shall be measured between faces of excavation below bottom of sheeting.

3. Sides of trenches shall be practically plumb and under no circumstances will they be permitted to be sloped unless approved by the Engineer. Where more than one pipe is placed in a trench, a maximum clear distance of 12" shall be allowed from the wall of the nearest pipe.
4. Where, in the opinion of the Engineer the grade is suitable for foundation of work, the bottom of the trench shall be excavated flat to receive pipe and the bottom of trench under each joint or coupling hollowed out to allow for making joints.
5. Trenches excavated below proper grade, excepting at joints, shall be filled to proper grade with satisfactory material thoroughly rammed, to insure adequate support and stability of pipe or other structures.
6. Where rock is encountered, carry excavation 8-inches below required elevation and backfill with a 8-inch layer of AASHTO No. 57 coarse aggregate.

B. Trench Length:

1. No greater length of trench shall be left open, in advance of completed structure placed therein, than shall be authorized or directed by the Engineer. The Engineer shall be empowered at anytime to require backfilling of open trenches over completed pipe lines, if in their judgement such action is necessary. The Contractor shall have no claim for extra compensation, even though to accomplish said backfilling he may be compelled to temporarily stop excavation or other work.
2. If work is stopped on any trench, for any reason except by order of the Engineer, and excavation is left open for an unreasonable length of time in advance of construction, the Contractor shall, if so directed, backfill such trench at his own expense, and shall not again open said trench until he is ready to complete structure therein. If the Contractor refuses or fails to backfill such trench completely within eight (8) hours the Owner shall authorize the work to be performed by other forces, and the Owner shall charge expense thereof to the Contractor and retain same out of any monies due or to become due him under the contract.
3. Unless otherwise authorized, excavation of trenches may be fully completed no more than (100) feet in advance of pipe laying.

C. Change of Trench Locations: Where the Engineer directs that the proposed location of a trench be changed, due to unforeseen conditions, the Contractor shall not be entitled to a claim of extra compensation, provided that the Contractor is notified of the change before excavation is begun. If a change, made at the direction of the Engineer, involves abandonment of an excavation already made, the abandoned excavation, together with necessary backfill will be classed as miscellaneous excavation and shall be paid as such.

In the event that the trench is abandoned at the Contractor's request, the abandoned excavation and backfill shall be at the Contractor's expense.

D. Preparation of Foundation: All irregularities and cavities, either in earth or rock excavation, in bottom of trenches or tunnels, shall be filled to required level with satisfactory fill material, and compacted, before pipe lines are laid therein.

E. Sheeting and Shoring:

1. The Contractor shall support sides and ends of all excavations or structures, when necessary or directed, with braces, sheeting, shores or stringers of quality and character required. All timbering or underpinning shall be placed or driven by men skilled in such work and shall be arranged so that it may be withdrawn as backfilling proceeds, without injury to structures built or adjacent structures or properties.
2. If, in opinion of the Engineer, the material furnished for timbering excavation is not of proper quality or size, or is improperly placed, the Contractor shall, upon notice, procure and place satisfactory timbering, or place said timbering in a satisfactory manner. Upon his failure to do so, work may be ordered stopped until said notice shall have been complied with and the Contractor shall not be entitled to any claim for extra compensation, for damage or delay.
3. Timbering in excavations may be withdrawn as the backfilling is being done, except to such extent as the Engineer shall order that said timbering be left-in-place. The Contractor shall cut off any sheeting left-in-place, at least 12 inches below finished grade where ordered by the Engineer and shall remove cut-off material without compensation for either material removed or material cutting and removal.

F. Dewatering Excavations:

1. There shall be provided and maintained at all times during construction of work, ample means and devices, including all necessary equipment, power and labor to pump, bail or otherwise promptly remove and properly dispose of all water and/or sewage entering, or found in the excavations, trenches or other parts of work. Well points shall be utilized wherever necessary to maintain dry conditions throughout working areas.
2. All costs for dewatering shall be included in bid price.
3. Method used to accomplish dewatering must meet with the Engineer's approval.
4. Existing piping shall not be used for drainage of excavation or trenches.

5. When in quicksand or soft ground, or for protection of any structure or property, sheeting shall be driven to a depth below bottom of excavation as may be required without extra compensation.
6. Water from pumping must be properly filtered before discharging.

G. Responsibility for Condition of Excavation:

1. The Contractor shall be solely responsible for condition of all his excavations, and any slides or cave-ins shall be removed without extra compensation.
2. Failure or refusal of the Engineer to order the use of bracing or sheeting, to order better quality or larger sizes of timber; to order sheeting, bracing or shoring left-in-place; to give orders or directions on methods or placing or driving sheeting, braces or shores, shall not relieve the Contractor of any responsibility concerning the condition of excavations or his obligation under the contract.
3. Any delay, (whether caused by the Contractor or by the Owner or their agents or employees) that requires keeping an excavation open longer than would otherwise have been necessary, shall not relieve the Contractor from his obligation to properly and adequately protect the excavation from cave-ins or slipping or any of his obligations under the contract relating to injury of persons or property. In any event it shall not entitle him to any claim for extra compensation.

H. Tunneling:

1. Tunneling will be allowed when permission is granted by the Engineer or when it is called for in the specifications or shown on the drawings.
2. Tunnels for laying pipelines shall be of sufficient size to allow joining of pipe and compacting of backfill around them. Tunnels shall be timbered where necessary, in accordance with approved methods. All methods of tunneling used shall be subject to approval of the Engineer. No extra payment will be made for excavation and backfill in tunnel.

I. Miscellaneous Excavation:

1. The Contractor shall do such miscellaneous excavating work as may be necessary and directed by the Engineer. Such excavation shall be subject to the same conditions and requirements specified herein for trench excavation.
2. Miscellaneous excavation shall include excavation for abandoned trenches or for any special structure outside of specified trench. Widths may not be shown on the drawings or described in specifications, where such excavation is done at direction of the Engineer.

3. When in the opinion of the Engineers an obstruction requires that the trench be excavated extra wide, such extra width shall be classified as "miscellaneous excavation" and backfill. Undercutting of the subgrade to establish a stable foundation shall also be considered miscellaneous excavation and backfill, but only where in the opinion of the Engineer proper dewatering techniques have been employed. Sloping the sides of an excavation for any reason, will not be considered as "miscellaneous excavation".

J. Test Pits: All costs for advance test pits ordered by the Engineer or made by the contractor along line and site of work, to determine character of subsurface materials, or the exact location of utilities, shall be included in the Contractors price bid for the work.

3.2 BACKFILLING

A. The Contractor shall backfill all excavations as rapidly as practicable, following inspection and approval of work by the Engineer.

B. No part of a pipe line or other structure that needs to be located or measured, shall be filled over or around until required tests and measurements have been made and permission given by the Engineer to backfill. Any backfilling done without authorization shall be uncovered by the Contractor at his own expense.

C. The Contractor shall under no circumstances, bury or add to the backfill, excavated or broken-up asphalt. All excavated asphalt must be hauled off site.

D. The material for backfilling within unpaved private right-of-ways shall be suitable soils as defined in Section 2.1A. The backfill material shall be evenly spread in built up layers not exceeding 8 inches for material compacted by heavy compaction equipment and 4 inches for material compacted by hand operated tampers, subject to approval of the Engineer. Backfill material may contain some rock but in no case shall it exceed more than 20 percent by volume.

E. WHEN THE OPENING IS WITHIN PAVED DRIVEWAYS, UNDER SIDEWALKS OR CURBS, OR WITHIN 10-FEET OF THE EDGE OF A ROAD THE BACKFILL MATERIAL SHALL BE PADOT 2A STONE.

F. Moisture Control

1. Where the subgrade or layer of stone material must be moisture conditioned before compaction, uniformly apply water to the layer of stone material.

2. Remove and replace, or scarify and air dry, stone materials that are to wet to permit compaction to specified density, to prevent free water appearing on the surface during or subsequent to compaction operations.

D. Dust Control

1. The Contractor shall make every effort to limit the amount of dust generated by construction activities. Appropriate methods and materials shall be employed and are subject to the approval of the Engineer.

3.3 MAINTENANCE

The Contractor shall maintain, at his own expense, all backfilled excavations in proper conditions as specified. All depressions appearing in backfilled excavations shall be promptly repaired by the Contractor. If the Contractor fails to make repairs within twenty-four (24) hours after receipt of written notice from the Engineer, the Owner may backfill said depression and the cost deducted from any monies due the Contractor. In an emergency, the Owner may backfill or protect any dangerous depression wherever necessary without giving previous notice to the Contractor and deduct the cost from any monies due or to become due the Contractor.

3.4 COMPACTION

The contractor shall be required to compact all backfill materials to a minimum of 95% of the materials maximum dry density as determined by ASTM D1557. For trenches within State highways, compact all backfill materials to a minimum of 100% of the materials maximum dry density.

3.5 TESTING

A. Testing Laboratory

1. Tests to determine conformance with all requirements for all Contractor secured materials proposed for use may be performed by the Engineer.
2. On-site quality control testing may be performed by the Engineer during construction to determine conformance with plans and specifications. Frequency of sampling and testing shall be as specified in Paragraph 3.5.C this section.
3. The Engineer will furnish the Contractor with copies of reports regarding tests and inspections of equipment, materials, and completed work.

B. During or after the backfill operations the Engineer may take soils compactions tests in conformance with A.S.T.M. Standard Procedures or other available methods. If

determined by the Engineer that any lift does not meet specified percent maximum dry density the contractor shall be required to dig test holes, as directed by the Engineer at various levels, throughout the backfill, at the contractors expense, so that additional tests may be taken. If the additional tests indicate unsatisfactory compaction the contractor shall remove all unsatisfactory backfill and recompact same to the required standards at his expense.

C. Frequency of Testing

1. Three (3) maximum dry density tests, in accordance with ASTM D1557, on each different type of soil or material encountered in the excavation or used for backfill.
2. A certified technician may be on site during the backfilling process. The technician will conduct in place density tests at the direction of the Engineer. At a minimum, these tests will be conducted on every lift at 10-foot intervals. Determine in-place density in the field in accordance with ASTM D1556, or by ASTM D2922 and ASTM D3017.
3. If it is determined by the Engineer that any lift does not meet the specified percent dry density, the Contractor shall dig test holes, as directed by the Engineer at various levels, throughout the backfill, at the Contractor's expense, so that additional tests may be taken. If the additional tests indicate unsatisfactory compaction, the Contractor shall remove all unsatisfactory backfill and recompact same to the required standards at his expense.

3.6 DISPOSAL OF MATERIAL

A. Immediately after excavating trench, all material not required shall be removed and disposed of by the Contractor in such a manner and at such point or points he may select, subject to the approval of the Engineers. All roads, sidewalks, and other places on line of work shall be left free, clean and in good order at the end of each work day. All removal and cleaning-up shall be done by the Contractor without extra compensation, and, if he fails to do such work within a reasonable time, after receipt of notice, the work will be performed by the Owner, and the cost deducted out of monies due or to become due the Contractor.

B. Remove all waste and excess materials daily, including excavated material classified as unsatisfactory soil material, trash and debris from the work area and legally dispose of it.

3.7 PA ACT 181 OF 2006

The Contractor shall be responsible for locating all underground structures and utilities, such as water mains, sewers, telephone and electric conduits, etc., and above ground utilities,

which may be encountered during construction operations. Test holes shall be dug to determine the position of the underground structures and utilities, or the Contractor shall arrange with the Owners of such underground structures and utilities to assign a representative to mark the locations. The Contractor shall pay the cost of digging test holes and likewise he shall pay the cost of the service of the representatives of the Owners of such utilities for locating the said utilities. And the cost of determining the locations is to be included in the prices bid. The location of existing structures and utilities as shown in the contract documents is simply for the guidance of the contractor and have not been field located and, since the information is as furnished by the respective utilities, or taken from non-as-built plans, the engineer is not responsible for the accuracy of the plans in this respect.

Anyone utilizing these contract documents for construction is advised to confirm with the requirements of PA Act 181 of 2006 prior to excavation.

END OF SECTION

SECTION 022230

SHEETING AND SHORING

PART 1 GENERAL

1.1 WORK INCLUDES

A. This work includes but is not limited to: designing, furnishing, installing and maintaining sheeting and shoring as required and necessary; cutting off of any sheeting left-in-place; driving sheeting to a sufficient depth below the bottom of the excavation and all appurtenant equipment, labor and supervision necessary to furnish, install and maintain the sheeting and shoring in a safe manner. All work must be in compliance with state and federal occupational health and safety regulations.

1.2 PRECAUTIONARY MEASURES

A. Trenches more than 4 feet deep shall be shored, sheeted, braced, or some other equivalent means of protection shall be provided where employees may be exposed to moving ground or cave-ins. Trenches less than 4 feet in depth shall also be effectively protected when examination of the ground indicate hazardous ground movement may be expected.

B. If, in the opinion of the Engineers, the material furnished for timbering excavations is not of proper quality, size, or improperly placed, the Contractor shall, upon notice, procure and place satisfactory timbering, or place said timbering in a satisfactory manner. Upon his failure to do so work may be ordered stopped until said notice shall have been complied with and the Contractor shall not be entitled to any claim for extra compensation, for damage, or delay.

C. Additional precautions by way of shoring and bracing shall be taken to prevent slides or cave-ins when excavations or trenches are made in locations adjacent to backfilled excavations, or where excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, construction equipment or any other source.

D. If it is necessary to place or operate power shovels, derricks, trucks, or other heavy objects on a level above and near an excavation, the side of the excavation shall be shored, and braced as necessary to resist the extra pressure due to such superimposed loads.

E. Trees, boulders, and other surface encumbrances, located so as to create a hazard to employees involved in excavation work or in the vicinity thereof at any time during operations, shall be removed or made safe before excavating is begun.

F. Diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. Water shall not be allowed to accumulate in an excavation.

G. No person shall be permitted under loads handled by power shovels, derricks, or hoists.

H. When employees are required to be in trenches 4 feet deep or more, an adequate means of exit, such as a ladder or steps, shall be provided and located so as to require no more than 25 feet of lateral travel.

I. Where employees are required or permitted to cross over excavations, walkways or bridges with standard guardrails shall be provided as necessary or required.

J. Climbing on a supporting construction loads from the sheeting and shoring is prohibited.

K. The trench shall be safe from exhaust gases entering from machines and equipment working nearby.

L. Excessive deflections of sheeting and shoring members will not be permitted.

M. Trenches shall be properly barricaded and protected at all times.

PART 2 PRODUCTS

2.1 MATERIALS

A. Materials used for sheeting, bracing and shoring shall be in good serviceable condition, and timbers used shall be sound and free from large or loose knots, and

shall be designed and installed so as to be effective to the bottom of the excavation.

B. Portable trench boxes or sliding trench shields may be used in lieu of a shoring system. Where such trench boxes or shields are used, they shall be designed, constructed and maintained in a manner which will provide protection both for workers and adjacent utilities equal to or greater than sheeting and shoring.

PART 3 EXECUTION

3.1 CONSTRUCTION METHODS

A. All sheeting and shoring shall be placed or driven by men skilled in such work and shall be arranged that it may be withdrawn as backfilling proceeds, without injury to structures built or adjacent structures or properties.

B. Bracing or shoring of trenches shall be carried along with the excavation.

C. Cross braces or trench racks shall be placed in true horizontal position, be spaced vertically, and be secured to prevent sliding, falling, or kickouts. Cross braced shall be supported against downward movement by hangers, blocks, sole plates or cleats. All wedges shall be driven tight.

D. When in quicksand or soft ground, or for protection of any structure or property, sheeting shall be driven to a depth below bottom of excavation as may be required without extra compensation.

E. The pumping arrangement shall avoid drawing materials from behind sheeting.

F. In no case shall excavated materials be stockpiled adjacent to the trench.

G. Where groundwater is present continuous close sheeting and shoring shall be installed. Sheeting boards shall be installed with a 1/2" space between boards to allow the water to seep into the trench and relieve the hydrostatic pressure. The water shall then be pumped out as required straw or other suitable material shall be used to fill the ½" space and prevent loss of soil.

H. Sheeting and shoring is to be left in place. The Contractor shall cut off any sheeting at least eighteen (18) inches below finished grade and shall remove cut-off material.

I. Backfilling and removal of trench supports shall progress together from the bottom of the trench. Jacks or braces shall be released slowly and, in unstable soil, ropes shall be used to pull out the jacks or braces from above after employees have cleared the trench.

END OF SECTION

SECTION 022250

MILLING OF BITUMINOUS PAVEMENT SURFACE

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. This work shall consist of variable depth milling of an existing bituminous pavement surface, with specified equipment, to the depth indicated. The exact locations, limits and depths of the areas to be milled are at the discretion of the Engineer. This work includes: cutting a vertical line in the existing bituminous surface at the ends of the milled areas; removal and disposal of all milled material; cleaning the areas to be milled with brooms, mechanical sweepers or vacuums immediately before and after completion of milling operations in a manner satisfactory to the Engineer and all necessary appurtenant work.

1.2 REFERENCE STANDARDS

A. Pennsylvania Department of Transportation (PennDOT) Publication 408 Specifications, latest edition.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 EQUIPMENT

A. Milling Machine:

1. Use a milling machine designed and built for this type of work. Provide a machine with an effective automatic grade and slope control system to within 1/8-inch and has the capacity to mill concrete patches.
2. The machine shall be equipped and capable of removing existing bituminous material to a depth of at least 3 inches below the existing roadway surface.

3. The machine shall be self-propelled and capable of being operated at speeds from ten (10) to forty (40) feet per minute.
4. The cutting width of the machine shall not be less than forty-eight (48) inches, unless milling around manholes and valve boxes.
5. The milling machine shall have all necessary safety equipment for operation in traffic and residential streets.

B. Appurtenant Equipment:

1. The contractor shall provide all appurtenant equipment necessary to satisfactorily perform this work in an expeditious manner. This equipment includes but is not limited to: dump trucks, loaders, mechanical sweepers, vacuums, compressors, saw cutting equipment, jack hammers and miscellaneous tools.

3.2 CONSTRUCTION METHODS:

A. Cleaning and Preparation:

1. Notify the Engineer and the appropriate municipal officials at least one (1) week prior to beginning milling operations so that suitable arrangements can be made to restrict parking. The contractor shall be responsible for coordinating all parking restrictions, and traffic control as specified herein.
2. All milled areas shall be cleaned by brooms, mechanical sweepers or vacuums immediately prior to beginning milling operations as necessary to ensure safe and efficient milling operations. This operation is at the discretion of the Contractor, however, the Engineer may order the streets to be cleaned at certain locations to ensure efficient operations.
3. Saw cut a vertical notch line in the existing bituminous surface at the ends of the milled areas and at intersecting streets where ordered by the Engineer. Pavement notches are to be a minimum of six (6) feet wide.

B. Milling Operations:

1. The bituminous paving shall be removed in one continuous forward motion by an approved power operated milling machine by planing, grinding or cutting.
2. Mill so the finished surface is free from gouges, grooves, and ridges.
3. Control the rate of milling to avoid tearing of the mat, resulting in chunky and nonuniformly milled material. Separate oversize and chunky milled material, as directed. Keep the milled pavement surface free of all loose materials and dust.

4. Sufficient passes or cuts shall be made to eliminate pavement irregularities and/or high spots. 100% of the surface area shall be milled to the depth and slope indicated or as directed by the Engineer.
5. To facilitate traffic control and to ensure the safe movement of traffic remove and dispose of all milled material, as specified, immediately after the milling operation.
6. The Contractor shall mill around all utility boxes and/or manholes and inlets. The Contractor will be responsible for replacing those utilities that are damaged or ruined by the milling operation. Areas adjacent to all utility structures not accessible to the milling machine will be removed by other methods by the contractor at no extra charge.
7. The Contractor shall not mill closer to the curb with the milling machine than six (6) inches. Areas adjacent to all curbs not accessible to the milling machine will be removed by other methods by the contractor at no extra charge.
8. All milled areas shall be cleaned by brooms, mechanical sweepers or vacuums immediately after completion of milling operations in a manner satisfactory to the Engineer as required for the application of a new surface course. The Contractor shall be responsible for maintaining the milled surface in a clean condition until the application of a new surface course.
9. **THE MAXIMUM ELAPSED TIME BETWEEN THE MILLING OPERATION AND THE PAVING SHALL BE FIVE (5) WORKING DAYS UNLESS WRITTEN PERMISSION IS PROVIDED BY THE COUNTY.**

C. Disposal of Milled Material:

1. The contractor shall legally dispose of, off site, all milled material in a manner acceptable to the engineer.
2. Written verification from the owner of the disposal site must be provided by the contractor prior to the commencement of any milling operation.
3. Material which is deposited in a manner or in locations which are unacceptable to the engineer shall be immediately removed or corrected at the contractor's expense.

END OF SECTION

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SECTION 024010

DEWATERING

PART 1 GENERAL

1.1 WORK INCLUDED

A. Contractor shall furnish all materials, implements, machinery equipment, tools, supplies, transportation, labor and supervision required to perform and maintain all dewatering as required throughout the duration of this contract.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Soil Erosion and Sediment Control - Section 021200

B. Utility Excavation, Backfill & Compaction – Section 022210

1.3 GENERAL REQUIREMENTS

A. All applicable regulations of fish and wildlife agencies and statutes relating to the prevention and abatement of water pollution shall be complied with. The County will obtain and pay for any required permits. However, all inspection fees, if applicable, shall be borne by the Contractor, whether same is billed directly to bidder or to the Owner. Should any such bill be left unpaid by the Contractor, the Owner shall be empowered to pay such bills and the cost thereof deducted from any monies due or to become due the Contractor.

1.4 SUBMITTALS

A. Contractor must submit to the Engineer for approval a plan and method of dewatering including staging, locations, size and spacing, hydraulic design calculations, and proposed disposal and filtering system.

1.5 GENERAL REQUIREMENTS

A. The Contractor shall provide and maintain at all times, before and during construction of work, ample means and devices, including all necessary equipment, power and labor to pump, bail or otherwise promptly remove and properly dispose

of all water and/or sewage entering, or found in the excavations, trenches or other parts of work. Well points shall be utilized wherever necessary to maintain dry conditions throughout working areas. Excavation and structures must be kept dry until all work to be built therein is completed.

B. Contractor shall maintain throughout the duration of the contract, ample provisions to prevent flotation of structures and shall be responsible for any damage caused by water.

C. It shall be the Contractor's responsibility to assure that dewatering operations are conducted so as not to affect adjacent structures. Contractor shall be responsible for any damage to adjacent structures.

PART 2 MATERIALS AND EQUIPMENT

NOT USED

PART 3 EXECUTION

3.1 Water from pumping must be properly filtered before discharging. Method must be approved by the Engineer before proceeding.

3.2 Contractor must provide one (l) emergency standby pump for the duration of dewatering operations.

3.3 All methods of executing the work shall be performed in an approved first class, safe, workmanlike manner and shall conform to the best practice of the industry.

3.4 Contractor shall provide continuous pumping if required and all costs shall be borne by him.

3.5 Contractor will not be permitted to pump water containing silt and or mud into any stream or lake.

END OF SECTION

SECTION 024119

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Demolition and removal of selected site elements.
2. Patching and repairs.

1.2 DEFINITIONS

A. Remove: Remove from project site and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the owner's property.

B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner’s property. Remove, clean and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.

C. Existing to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Engineer, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.3 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections, for information only, unless otherwise indicated.

B. Proposed dust-control measures.

C. Proposed noise-control measures.

1.5 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Engage an experienced firm that has successfully completed selective demolition Work similar to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before starting selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Predemolition Conference: Conduct conference at Project site.

1.6 SCHEDULING

A. Arrange selective demolition schedule so as not to interfere with Owner's on-site operations.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
2. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated electrical or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Engineer.

E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to owner and to governing authorities.

a. Provide not less than 72 hours' notice to Owner/Engineer if shutdown of service is required during changeover.

B. Utility Requirements: Locate, identify, disconnect and seal or cap off indicated utility services.

1. Arrange to shut off indicated utilities with utility companies.
2. Where utility services are required to be removed, relocated or abandoned, provide bypass connections to maintain continuity of service before proceeding with selective demolition.
3. Cut off pipe or conduit to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit after bypassing.

C. Utility Requirements: Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PREPARATION

A. Drain, purge or otherwise remove, collect and dispose of chemicals, gases, explosives, acids, flammables or other dangerous materials before proceeding with selective demolition operations.

B. Conduct demolition operations and remove debris to insure minimum interference with roads, streets, walks and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks or other adjacent occupied or used facilities without permission from Owner and other authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies and covered passageways, where required by authorities having jurisdiction.
2. Protect existing site improvements, appurtenances and landscaping to remain.

3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces and new construction to insure that no water leakage or damage occurs to structure or interior areas.

3.4 POLLUTION CONTROLS

A. Use water mist, temporary enclosures and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding and pollution.

B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

C. Clean adjacent structures and improvements of dust, dirt and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.5 SELECTIVE DEMOLITION

A. Demolish and remove existing above and below grade construction only to the extent necessary to facilitate new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level.
2. Neatly cut openings and holes plumb, square and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
3. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
4. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.

C. Remove slabs, paving, curbs, and all aggregate bases as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

D. Removal of existing paving includes removal of all subbase materials to a firm subgrade.

3.6 PATCHING AND REPAIRS

A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

1. Completely fill holes and depressions in existing masonry walls to remain with an approved masonry patching material, applied according to manufacturer's printed recommendations.

C. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.

D. Patch and repair sidewalk surfaces where demolition extends from one finished area onto another. Provide a flush and even surface of uniform color and appearance.

1. Closely match texture and finish of existing adjacent surface.
2. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
3. Inspect and test patched areas to demonstrate integrity of the installation, where feasible.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

E. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

F. Burning: Do not burn demolished materials.

G. Disposal: Transport demolished materials to be salvaged at area designated by Owner.

H. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 025070

CONCRETE SIDEWALK AND APRONS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Contractor shall furnish all materials, implements, machinery equipment, tools, supplies, transportation, labor and supervision required to construct a 4-inch minimum plain cement concrete sidewalk or 6-inch minimum concrete apron on a minimum 4-inch aggregate subbase, including removal, adjustment, resetting or replacement of adjacent facilities including but not limited to traffic signs, fences and utility boxes.

1.2 REFERENCE STANDARDS

A. Pennsylvania Department of Transportation (PennDOT) Publication 408, Specifications, latest edition.

1.3 SUBMITTALS

A. Material Certificates: Provide copies of material certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

PART 2 PRODUCTS

2.1 MATERIALS

A. Concrete:

1. Shall be air entrained (6%), 4,000 p.s.i. PennDOT Class AAA concrete in accordance with Section 704 of PennDOT Specifications, Publication 408, latest edition. Maximum water-cement ratio shall not exceed 0.45.

B. Aggregate Subbase:

1. Shall be PennDOT 2A or AASHTO No. 57 material meeting the requirements of Section 703.2, PaDOT Specifications, Publication 408, latest edition.

C. Premolded Expansion Joint Filler:

1. Shall be ½-inch thick fiber expansion joint filler.

D. Curing Materials:

1. Shall be white polyethylene sheeting, burlap, or clear or white liquid membrane-forming curing compound in accordance with PaDOT Specifications, Publication 408, latest edition.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

A. The sidewalk area shall be excavated to the proposed subgrade line. The excavation shall include the removal of existing paving or sidewalk, if necessary and the disposal of all excess material.

B. The subgrade line shall be cut to the required minimum depth below and parallel to the finished grade. When directed, remove and replace unsuitable material with acceptable material, as approved by the Engineer.

C. The subgrade shall be compacted to a firm, even surface and moistened as necessary to prevent absorption of water from the concrete.

D. All sewer vent boxes, gas, and water service valve boxes shall be reset to finished grade.

3.2 AGGREGATE PLACEMENT

A. The aggregate shall be placed on the prepared subgrade to form a thoroughly compacted base 4-inches deep.

B. The top surface of the aggregate base shall be 4 or 6-inches below and parallel to the finished grade which shall have a transverse grade of ¼-inch per foot sloping towards the roadway, unless otherwise directed or indicated.

3.3 FORMWORK

A. Shall be acceptable wood or metal forms extending the full depth of the concrete.

B. The forms shall not be removed until at least 12 hours after placing the concrete.

C. After the removal of forms, honeycombed areas shall be filled with mortar.

D. After the concrete has cured for at least 48 hours and the forms have been removed, backfill the spaces adjacent to the sidewalk, using acceptable material.

3.4 JOINTS

A. Expansion joints shall be in accordance with the plan generally placed at the following locations as directed by the Engineer: Opposite expansion joints in adjacent curb, between the sidewalk and curb, between the sidewalk and rigid structures, and elsewhere at intervals not exceeding 28 feet transversely.

B. Contraction joints shall be in accordance with the pattern indicated on the plans.

C. All joints shall be neatly edged with a ¼-inch radius edging tool.

3.5 PLACING AND FINISHING

A. Concrete shall be placed on the moist aggregate base to a depth of 4-inches, compacted and screeded to the proper grade.

B. When the concrete has firmed to a suitable consistency, the surface shall be finished with a broomed finish.

C. The finish surface shall be granular in texture and all edges shall be rounded to a radius of ¼ inch.

D. In accordance with Section 704 of PaDOT Specifications, Publication 408, latest edition.

E. Carbon copies of all concrete delivery slips, indicating quantity and mix design, shall be given to the engineer, daily, for each delivery.

3.6 PROTECTION AND CURING

A. Traffic shall be excluded and the sidewalk shall be protected and cured for a period of not less than 72 hours after completion.

B. If polyethylene sheets of burlap are used for curing they shall be properly weighted down and the concrete shall be kept moist through the curing period.

C. Concrete sidewalk shall not be placed when the air temperature is below 40°F unless approved precautions are taken to prevent freezing.

3.7 ACCEPTANCE

A. All defects found shall be repaired or replaced by the Contractor, at his expense, to the full satisfaction of the Engineer prior to acceptance.

B. Concrete sidewalk which ponds water at any location is not acceptable and must be removed and replaced at the Contractor's expense. The extent of replacement will be determined by the Engineer.

END OF SECTION

SECTION 025450

SUPERPAVE ASPHALT MIXTURE DESIGN,
HMA BASE COURSE

PART 1 GENERAL

1.1 DESCRIPTION

A. This work shall consist of installing a certified plant-mixed HMA base course on a prepared surface within reasonably close conformity to the lines, grades and limits shown on the construction documents. The base course shall be constructed to the minimum compacted depth and density and to the distances below the finished grade, as indicated in the construction documents.

1.2 DESIGN STANDARDS

B. Unless otherwise indicated, the following design standards shall be used:

1. Mix Design – 25mm.
2. Equivalent Single Axle Load – .3 to 3.0 million.
3. Performance Grade – PG 64-22.
4. Mat Thickness – 150mm (6-inches) State Highways
   200 mm (8-inches) Township Roads
   62.5 mm (2.5-inches) Parking Lot

B. All standards shall be in accordance with PennDOT Publication 408, latest edition, Sections 309 and 409.

1.3 MIXTURE ACCEPTANCE

A. For Township Roads, Certification Acceptance level will be used. Criteria for acceptance shall be as specified in PennDOT Publication 408, Section 409.2(f).

B. Provide PennDOT Form CS-4171 from a plant approved in Bulletin 15. Attach all QC test results to the form. Certify mixture as specified in Section 106.03 and the requirements of Section 409.

C. Provide all forms and supporting certifications to the Engineer a minimum of 10-days prior to the commencement of work.

D. For State Highways, mixture acceptance may be by other methods, as specified in PennDOT Publication 408, Section 409. It is incumbent upon the contractor to contact the PennDOT representative to determine which criteria for acceptance will be used for the specific project.

1.4 MATERIAL

C. All material shall be in accordance with Section 409.2 of PennDOT Publication 408, latest edition.

1.5 EQUIPMENT

A. Hauling Equipment.

1. Haul the mixtures in tightly sealed vehicles that do not contain petroleum oils, solvents, or other materials that adversely affect the mix.
2. Provide covers of sufficient size and quality to protect the entire load under all conditions.
3. Maintain the proper and uniform temperature specified in Section 409.3(h)1 of PennDOT Publication 408, latest edition.
4. Provide insulation on all sides of the truck body, a double-walled body, or a heated body when the air temperature is below 50°F.

B. Bituminous Pavers

1. Use self-contained, power-propelled units with activated screeds or activated strike-off assemblies and with automatic screed controls capable of producing a finished surface of the specified evenness and texture.
2. Provide heated units capable of spreading and finishing the mixture to the widths and depths indicated.
3. Provide units capable of being operated at forward speeds consistent with the satisfactory laying of the mixture and equipped with receiving hoppers having sufficient capacity for uniform spreading and equipped with distribution systems that place the mixture uniformly in front of the screeds.
4. Do not use any equipment that tears, shoves, or gouges the mixture or that causes tracks, indented areas, flushing segregation or other permanent blemishes. Do not use blade graders or other earthmoving equipment.

C. Rollers

1. Use steel-wheel, pneumatic-tire or vibratory rollers as specified in Section 108.05(c)3 of PennDOT Publication 408, latest edition. Operate rollers according to manufacturer's recommendations.

1.6 CONSTRUCTION METHODS

A. Time Restrictions

1. Do not place paving mixtures from November 1 to March 31 unless written permission is obtained from County or State Officials.

B. Weather Limitations

1. Do not place base course when the air or prepared surface temperature is 35°F or lower.
2. If work is halted because of weather conditions, the Contractor may be permitted to place limited quantities of the base course that is en route to the project provided the placement is approved by the Project Representative on site.
3. Should the conditions not permit the material to be placed, the Contractor shall have no recourse for payment of any unused material.

C. Preparation of Existing Surface.

1. Thoroughly roll all subgrade with a minimum 10-ton vibratory roller such that the finished product is properly compacted, stable at a uniform elevation and all aggregate is firmly embedded. For areas inaccessible to a roller, use a vibratory plate tamper or jumping jack to achieve the same criteria.
2. Compact subgrade to a minimum percentage specified of the materials maximum dry density as determined by ASTM D-698-70.

   For State Highways: minimum 100%
   For Township Roads: minimum 95%

3. If soft areas are encountered, the Engineer may direct the Contractor to allow sufficient time for the subgrade to dry out. If the area cannot be suitably compacted, the Engineer can order it removed and backfilled with suitable material. If soft areas are caused by the Contractor, those areas will be removed and backfilled at the Contractor's expense.

4. Do not allow equipment on the prepared subbase after final rolling and conditioning.
5. Paint all vertical surfaces of curbs, structures, gutter and pavements that will be in contact with bituminous mixtures with a uniform coating of bituminous material, Class E6 or E8.

D. Spreading and Finishing.

1. Unless otherwise directed, deliver, place and compact pawns, mixtures during daylight hours.
2. Ensure that mixtures are delivered and placed at the following laying temperatures. Ensure mixture does not contain lumps of cold material

	TEMPERATURE OF MIXTURE	
CLASS OF MATERIAL	MIN (°F)	MAX (°F)
PG 64-22	265	320

For other classes of material, refer to PennDOT Publication 408, Section 409.2 for temperature ranges.

3. Spread and strike off the mixture for the entire lane width or as much lane width as practical. Adjust screed assemblies to provide the required cross section and depth. After spreading, do not add any mixture to the mat that is segregated, below the minimum temperature, contains either a deficiency or excess of asphalt, or is otherwise unsuitable.
4. In areas where mechanical spreaders cannot be used, place and screed the mixture with suitable hand tools. Do not use rakes.
5. If the base course is more than 150 mm (6-inches), place the course in two or more layers of approximately equal depth, with no layer less than 80 mm (3-inches) or more than 150 mm (6-inches). If the compacted depth of the base course is more than 200 mm (8-inches), please the course in two or more layers of approximately equal depth with no layer less than 100 mm (4-inches) or more than 200 mm (8-inches).
6. Install the base course to within 6 mm (1/4-inch) of final elevations. Remove and replace any irregularities more than 6 mm (1/4-inch).

E. Joints

1. Longitudinal.

a. Plan joint locations to ensure that the joint in the top layer is at the approximate pavement centerline for two-lane roadways and within 300 mm (12-inches) of the lane lines for roadways with

more than two lanes. Offset joints in a layer from the joint in the layer immediately below by approximately 150 mm (6-inches).

b. If traffic or other causes distort the lane edge, restore it to its original shape using either a vertical or notched wedged joint per Section 409.3 of PennDOT Publication 408, latest edition.

2. Transverse.

a. Construct joints perpendicular to the pavement centerline.
b. Provide a true vertical surface and cross section throughout the entire joint.
c. Paint the joint face with a thin coating of bituminous material before placing fresh mixture against the joint face.

F. Compaction.

1. Compact the mixture to achieve the density acceptance requirements and to eliminate all roller marks.
2. Compact the mixture while it is in the proper condition. Adjust roller speed, amplitude, frequency pattern and roller size to eliminate displacement, shoving, cracking and aggregate breakage. Satisfactorily correct all displacement.
3. Maintain wheels of the steel-wheel rollers moist and clean to prevent the mixture from adhering to the wheels.
4. For areas inaccessible to rollers, compact with mechanical vibrating hand tampers.

G. Mat Density Acceptance.

1. Density acceptance level will be either by Non-Movement or Optimum – Rolling Pattern as outlined in PennDOT Publication 408, Section 409.3.
2. Density limits shall comply with Table E of Section 409.3, Publication 408, latest edition.

H. Field Technician.

1. Provide a certified HMA field technician in accordance with the qualifications outlined in Publication 351 to control placement of the bituminous mixtures. The certified HMA field technician must be onsite and carry a valid certification card during placement of all HMA mixtures.

I. Protection of Courses.

1. Do not allow vehicular traffic or loading on newly compacted courses until adequate stability and adhesion is obtained and the material has cooled to 140°F or less.

J. Defective Work.

1. Remove and replace all work determined to be defective by the Engineer. Defective work will be as defined in PennDOT Publication 408, latest edition, Sections 105, 309 and 409.
2. Defective work will not be measured for payment until it is satisfactorily corrected.

END OF SECTION

SECTION 025470

SUPERPAVE ASPHALT MIXTURE DESIGN,
HMA BINDER AND WEARING COURSE

PART 1 GENERAL

1.1 DESCRIPTION

A. This work shall consist of installing a certified plant-mixed HMA Binder or Wearing course on a prepared surface within reasonably close conformity to the lines, grades and limits shown on the construction documents. The base course shall be constructed to the minimum compacted depth and density and to the distances below the finished grade, as indicated in the construction documents.

1.2 DESIGN STANDARDS

B. Unless otherwise indicated, the following design standards shall be used:

1. Mix Design – 19mm. - Binder
   9.5mm - Wearing
2. Equivalent Single Axle Load – 3.0 to 10.0 million.
3. Performance Grade – PG 64-22.
4. Mat Thickness – 50mm (2-inches) Binder Course
   40mm (1½-inches Wearing Course
5. Skid Resistance Level (SRL) – Level E

B. All standards shall be in accordance with PennDOT Publication 408, latest edition, Sections 309 and 409.

1.3 MIXTURE ACCEPTANCE

A. For Township Roads, Certification Acceptance level will be used. Criteria for acceptance shall be as specified in PennDOT Publication 408, Section 409.2(f).

B. Provide PennDOT Form CS-4171 from a plant approved in Bulletin 15. Attach all QC test results to the form. Certify mixture as specified in Section 106.03 and the requirements of Section 409.

C. Provide all forms and supporting certifications to the Engineer a minimum of 10-days prior to the commencement of work.

D. For State Highways, mixture acceptance may be by other methods, as specified in PennDOT Publication 408, Section 409. It is incumbent upon the contractor to contact the PennDOT representative to determine which criteria for acceptance will be used for the specific project.

1.4 MATERIAL

C. All material shall be in accordance with Section 409.2 of PennDOT Publication 408, latest edition.

1.5 EQUIPMENT

A. Hauling Equipment.

1. Haul the mixtures in tightly sealed vehicles that do not contain petroleum oils, solvents, or other materials that adversely affect the mix.
2. Provide covers of sufficient size and quality to protect the entire load under all conditions.
3. Maintain the proper and uniform temperature specified in Section 409.3(h)1 of PennDOT Publication 408, latest edition.
4. Provide insulation on all sides of the truck body, a double-walled body, or a heated body when the air temperature is below 50°F.

B. Bituminous Pavers

1. Use self-contained, power-propelled units with activated screeds or activated strike-off assemblies and with automatic screed controls capable of producing a finished surface of the specified evenness and texture.
2. Provide heated units capable of spreading and finishing the mixture to the widths and depths indicated.
3. Provide units capable of being operated at forward speeds consistent with the satisfactory laying of the mixture and equipped with receiving hoppers having sufficient capacity for uniform spreading and equipped with distribution systems that place the mixture uniformly in front of the screeds.
4. Do not use any equipment that tears, shoves, or gouges the mixture or that causes tracks, indented areas, flushing segregation or other permanent blemishes. Do not use blade graders or other earthmoving equipment.

C. Rollers

1. Use steel-wheel, pneumatic-tire or vibratory rollers as specified in Section 108.05(c)3 of PennDOT Publication 408, latest edition. Operate rollers according to manufacturer's recommendations.

1.6 CONSTRUCTION METHODS

A. Time Restrictions

1. Do not place paving mixtures from November 1 to March 31 unless written permission is obtained from County or State Officials.

B. Weather Limitations

1. Do not place base course when the air or prepared surface temperature is 40°F or lower.
2. If work is halted because of weather conditions, the Contractor may be permitted to place limited quantities of material that is en route to the project provided the placement is approved by the Project Representative on site.
3. Should the conditions not permit the material to be placed, the Contractor shall have no recourse for payment of any unused material.

C. Preparation of Existing Surface.

1. Remove and dispose of all loose and foreign material including, dirt, dust, mud, excess joint and crack sealer and all other foreign material. Employ a power or portable truck broom for large areas.
2. Should excessive amounts of dirt and/or dust be embedded within the base course, the Engineer may order the surface to be blown off with compressed air to remove this material.
3. All surfaces to receive either binder or wearing course must be dry.
4. Before overlaying any surfaces, apply specified tack coat at a rate in accordance with Section 460 or as directed by the Engineer.
5. Paint all vertical surfaces of curbs, structures, gutter and pavements that will be in contact with bituminous mixtures with a uniform coating of bituminous material, Class E6 or E8.

D. Spreading and Finishing.

1. Unless otherwise directed, deliver, place and compact pawns, mixtures during daylight hours.
2. Ensure that mixtures are delivered and placed at the following laying temperatures. Ensure mixture does not contain lumps of cold material

	Temperature of Mixture	
Class of Material	Min (°F)	Max (°F)
PG 64-22	265	320

For other classes of material, refer to PennDOT Publication 408, Section 409.2 for temperature ranges.

3. Spread and strike off the mixture for the entire lane width or as much lane width as practical. Adjust screed assemblies to provide the required cross section and depth. After spreading, do not add any mixture to the mat that is segregated, below the minimum temperature, contains either a deficiency or excess of asphalt, or is otherwise unsuitable.
4. In areas where mechanical spreaders cannot be used, place and screed the mixture with suitable hand tools. Do not use rakes.
5. Install the binder or wearing course to within 6 mm (1/4-inch) of final elevations. Remove and replace any irregularities more than 6 mm (1/4-inch).

E. Joints

1. Longitudinal.

   a. Plan joint locations to ensure that the joint in the top layer is at the approximate pavement centerline for two-lane roadways and within 300 mm (12-inches) of the lane lines for roadways with more than two lanes. Offset joints in a layer from the joint in the layer immediately below by approximately 150 mm (6-inches).
   b. If traffic or other causes distort the lane edge, restore it to its original shape using either a vertical or notched wedged joint per Section 409.3 of PennDOT Publication 408, latest edition.

2. Transverse.

   a. Construct joints perpendicular to the pavement centerline.

b. Provide a true vertical surface and cross section throughout the entire joint. All joints within the wearing course shall be saw joints.
c. Paint the joint face with a thin coating of bituminous material before placing fresh mixture against the joint face.

F. Compaction.

1. Compact the mixture to achieve the density acceptance requirements and to eliminate all roller marks.
2. Compact the mixture while it is in the proper condition. Adjust roller speed, amplitude, frequency pattern and roller size to eliminate displacement, shoving, cracking and aggregate breakage. Satisfactorily correct all displacement.
3. Maintain wheels of the steel-wheel rollers moist and clean to prevent the mixture from adhering to the wheels.
4. For areas inaccessible to rollers, compact with mechanical vibrating hand tampers.

G. Mat Density Acceptance.

1. Density acceptance level will be either by Non-Movement or Optimum – Rolling Pattern as outlined in PennDOT Publication 408, Section 409.3.
2. Density limits shall comply with Table E of Section 409.3, Publication 408, latest edition.

H. Field Technician.

1. Provide a certified HMA field technician in accordance with the qualifications outlined in Publication 351 to control placement of the bituminous mixtures. The certified HMA field technician must be onsite and carry a valid certification card during placement of all HMA mixtures.

I. Protection of Courses.

1. Do not allow vehicular traffic or loading on newly compacted courses until adequate stability and adhesion is obtained and the material has cooled to 140°F or less.

J. Surface Tolerance.

1. Surface tolerance shall be as defined by Section 409.3(L). The pavement will be considered defective if irregularities are more than 3/16-inch over a 10-foot length.

K. Defective Work.

1. Remove and replace all work determined to be defective by the Engineer. Defective work will be as defined in PennDOT Publication 408, latest edition, Sections 105, 309 and 409.
2. Defective work will not be measured for payment until it is satisfactorily corrected.

END OF SECTION

SECTION 027250

STORM SEWER PIPE

PART 1 GENERAL

1.1 DESCRIPTION

A. This work shall consist of furnishing and installing storm sewer of the type specified, at the depth indicated and on the bedding condition specified. This work includes but is not limited to: furnishing and placing the pipe; excavation; removal and disposal of excess material; bedding, select aggregate backfill and compaction; restoration; testing; and all appurtenant equipment, labor, materials, equipment and supervision necessary to install the pipe as specified.

B. The extent of the storm sewer system work is as indicated on drawings and schedules, and by requirements of this Section.

C. Storm sewer main shall be constructed of the materials indicated on the drawings.

D. Storm sewer system shall include but not be limited to:

1. Storm sewer piping.
2. Storm manholes, inlets, endwalls and other structures.
3. All excavating and backfill required for the storm sewer system.
4. Stakeout by Contractor from existing control points in field.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 022210 – Utility Excavation, Backfill and Compaction.

1.3 REFERENCE STANDARDS

A. Pennsylvania Department of Transportation (PennDOT) Publication No. 408, latest edition.

B. American Society for Testing of Materials (ASTM)

A 185	Welded Steel Wire Fabric for Concrete Reinforcement
A 615	Deformed and Plain Billet - Steel Bars for Concrete Reinforcement.
C 32	Sewer and Manhole Brick (Made from Clay or Shale).
C 76	Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
C 443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
C 478	Precast Reinforced Concrete Manhole Sections.
C 923	Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.
D 3034	Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings.
D 3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seal.
F 477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

C. American Water Works Association (AWWA)

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for storm system materials and products. Certificates of conformance for all materials shall be submitted in accordance with Division 1, assuring conformance with these specifications. All pipe and appurtenances specified herein shall be covered by a guarantee certificate furnished by the Contractor and signed by an officer of the pipe manufacturer.

B. Shop Drawings: Submit shop drawings showing piping materials. Include details of underground structures, connections, manholes, covers, castings, fittings and pipe.

C. Record Drawings: At project closeout, submit record drawings of installed storm sewer piping and products, in accordance with specifications.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Obtain materials from firms regularly engaged in manufacture of products of the types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

PART 2 PRODUCTS

2.1 PIPES AND PIPE FITTINGS

A. General: Provide pipes of the following materials as indicated on the drawings and specified herein. Provide pipe fittings and accessories of same material and weight/class as pipes, with joining method as indicated.

B. Reinforced Concrete Pipe:

1. All reinforced concrete pipe sewer shall be manufactured in accordance with current ASTM Designation C-76, entitled "Reinforced Concrete Culvert, Storm Drain and Sewer Pipe."
2. Steel reinforcement shall conform to specifications for cold-drawn steel wire under ASTM designation A-82; for wire fabric under ASTM designation A-185; or for reinforcing bars under ASTM designation A-615. Quadrant reinforcing of the pipe will not be permitted.
3. Joints shall be tongue and groove type sealed with “O”-ring gaskets unless otherwise indicated.
4. All fittings and sections, connections, etc. shall be of the same material as the pipe and furnished in classes suitable for the class of pipe with which they will be used.
5. Manufactured fittings shall be used as indicated and directed. Field fabricated bends are not permitted.
6. All pipe shall be Class III.

C. Corrugated Metal Pipe:

1. All corrugated metal pipe shall be Aluminized Steel Type 2.
2. Coating: All corrugated metal pipe and couplings shall be coated with a minimum of 1 oz/ft^2 of commercially pure aluminum inside and outside. Coating shall be a minimum of 1.9 mils.

3. Coupling Bands: Aluminized steel, 0.052 inches thick x 10-inch wide; connected with two (2) neoprene “O” ring gaskets and two (2) stainless steel bolts, nuts and other hardware.
4. Aluminized steel shall meet the requirements of AASHTO M36, M274.

D. Ductile Iron Pipe:

3. Pipe shall be Class 52 with push-on or mechanical joints conforming to AWWA C111 and AWWA C151 unless indicated otherwise.
4. Coatings: All buried ductile iron piping and fittings shall have standard bituminous coating applied to exterior surfaces. Interior surfaces of all ductile iron pipe and fittings shall have a double cement-mortar lining conforming to AWWA C104, seal coated inside.

E. HDPE Pipe

1. All pipe shall be high density polyethylene pipe meeting the requirements of ASTM D-1248 and ASTM F-894. All pipe shall have a smooth interior.
2. Joints hall have rubber gaskets in accordance with ASTM F-477 and shall meet the requirements of ASTM D-3212.
3. All pipe shall be installed in accordance with ASTM D-2321.
4. Pipe shall be as manufactured by Advanced Drainage Systems, Inc. or approved equal.

2.2 BRICK AND MORTAR

A. Brick: Conform to ASTM C32 Grade SM.

B. Mortar

1. Aggregate: ASTM C144.
2. Portland Cement: ASTM C150, Type I, of natural color - or white to produce required color.
3. Hydrated Lime: ASTM C207, Type S.
4. Water: Clean and potable.

C. Mortar Applications: One part portland cement and two parts sand with hydrated lime added not to exceed 20% of the "cement by weight.

2.3 CONCRETE AND REINFORCING

A. Concrete shall conform to drawings or specifications.

B. Reinforcing mesh and bars shall conform to ASTM A185 and ASTM A615, Grade 60.

2.4 STONE AGGREGATES

A. Crushed stone shall conform to the requirements for Coarse Aggregate in accordance with PennDOT Specification section 703.2, Size Number 57, Type C or better, as approved.

2.5 PIPE TO PIPE CONNECTORS

A. Flexible couplings shall be used to connect new pipe to existing pipe. Flexible couplings shall be as manufactured by Fernco, or equal, with #305 stainless steel straps, conforming to ASTM #C-594-70.

2.6 GROUT

A. Nonshrinking Grout

1. Required for patching manholes, pipes and plugging.
2. Grout shall be nonmetallic, as manufactured by one of the following:

a. Crystex, L and M Construction Chemicals, Inc.
b. Five Star Grout, U.S. Grout Corporation.
c. Masterflow 713 grout, Master Builder's, Inc.
d. Sauereisen F-100, Sauereisen Cement Company.
e. Supreme Grout, Gifford-Hill and Company.
f. Ferrolith C, Sonneborn-Contech.
g. EUCO NS, Euclid Chemical.

3. Prepare and place to manufacturer's printed instructions.

PART 3 EXECUTION

3.1 EXCAVATION AND BACKFILL

A. Excavation shall include the removal of material of whatever nature encountered within the limits of excavation, from the top of existing grade, or from the pavement subgrade line when existing paving is to be removed, to the pipe subgrade.

B. All slides, cave-ins, or unauthorized excess excavation shall be at the cost of the Contractor and he shall backfill, without compensation, any cavities so caused with suitable satisfactory material including concrete or masonry if the Engineer determines such material necessary.

C. Pipe failure may result if the design trench width is exceed. If the trench width exceeds the width used for design, a better class of bedding or stronger pipe, or both must be provided, if directed by the Engineer.

D. Open no more trench in advance of pipe laying than is necessary to expedite the work.

E. Excavate trenches to a width that will provide adequate working space, but not more than the maximum design width. Do not undercut trench walls.

F. Excavate trenches below the pipe invert a sufficient distance to provide space for the pipe bedding. Carry trenches in ledge rock, compact rocky or gravelly soil, or other unyielding materials below the bottom of the pipe at least one fourth of the outside diameter of the pipe, or in 4 in., whichever is greater. Refill the space beneath the pipe with specified pipe bedding material.

G. Excavate holes at each bell to provide full-length barrel support of the pipe and to prevent point loading at the bells or couplings.

H. Sheathing and shoring shall be used along the trenches, and shall be placed as required and necessary. It shall be left in place and shall be of sufficient strength to withstand all external pressures.

I. Additional requirements for pipe trench excavation, backfill and compaction shall be as specified herein for the appropriate conditions.

3.2 PIPE HANDLING

A. Protect pipe during handling against impact shocks and free fall. Do not permit hooks to come in contact with premolded joint surfaces.

B. Handle pipe having premolded joint rings or attached couplings so that no weight, including the weight of the pipe itself, will bear on or be supported by the jointing material. Take care to avoid dragging the spigot ring on the ground or allowing it to be damaged by contact with gravel, crushed stone, or other hard objects.

C. After delivery alongside the trench, the inspector will carefully examine each section of pipe for soundness and specification compliance. Unacceptable pipe will be marked with paint or other permanent marking material so that the marks

would be plainly visible if the pipe was placed in the trench. The inspectors presence or lack thereof, does not relieve the contractor of any responsibility. No defective pipe is to be installed.

D. After placing pipe lift holes shall be filled with concrete. Excess concrete that falls into the pipe shall be removed before the concrete sets.

3.3 PIPE BEDDING AND SUBGRADE PREPARATION

A. Surface grade fill material or trench subgrade beneath the pipe to provide a uniform, firm and continuous support beneath the pipe at all points between bell holes or pipe joints. Densify fill material beneath the pipe.

B. Carefully prepare bedding so that the pipe after installation will be true to line and grade.

C. After each pipe has been brought to grade, aligned, and placed in final position, deposit and densify sufficient bedding material under the pipe haunches and on each side of the pipe to hold the pipe in proper position during subsequent pipe jointing, bedding, and backfilling operations. Deposit bedding material uniformly and simultaneously on each side of the pipe to prevent lateral displacement.

D. The excavation into which the pipe is being laid shall be kept free from water and no joints shall be made underwater. Water shall not be allowed to rise in excavation until joint is complete. Care shall be used to secure watertightness and to prevent damage to joints during backfilling. All pipe joints shall be watertight within allowances established by these specifications.

3.4 PIPE LAYING

A. Pipe laying shall be accomplished only in the presence of the Engineer, or an authorized representative. Adequate and suitable equipment and appliances for safe and convenient handling and laying of pipes shall be used.

B. No pipe shall be placed upon a foundation into which frost has penetrated, nor at any time when the Engineer shall deem that there is a danger of formation of ice or penetration of frost at the bottom of excavation. Where the foundation is unsuitable, as determined by the Engineer, a stone or gravel foundation shall be placed and tamped to form an acceptable bed for the pipe.

C. Pipe shall be laid so that when completed, the interior bore will conform accurately to grades and alignment indicated by the contract documents or directed by the Engineer.

D. Pipes shall be thoroughly cleaned before they are laid and shall be kept clean until acceptance of completed work. Open ends shall be provided with a stopper carefully fitted so as to keep dirt and other substances from entering the pipe. Unless approved otherwise by the Engineer, a stopper shall be kept in the end of the line when work is not in progress.

E. Whenever practicable, start pipe laying at the lowest point and install the pipe so that the spigot ends point in the direction of flow.

F. Unless otherwise required, lay all pipe straight between changes in alignment and at uniform grade between changes in grade.

G. Before joints are made, each pipe shall be well bedded and no pipe shall be brought into position until the preceding length has been thoroughly secured in place.

H. Clean joint contact surfaces immediately prior to jointing. Use lubricants, primers, or adhesives as recommended by the pipe or joint manufacturer.

I. For pipes manufactured to accept "O" ring gaskets, the groove and the "O" ring gasket shall be lubricated as recommended by the manufacturer. The gasket shall be placed in the groove and the tension shall be equalized by inserting a suitable tool under the gasket and running it around the pipe three (3) times.

J. For pipes manufactured to accept fin type gaskets, the inside surface of the bell or groove and the gasket shall be lubricated as recommended by the manufacturer.

K. Where pipe connects with outside faces of manhole walls or the outside faces of the walls of other structures, provide a pipe joint such that slight flexibility or motion can take place in or near the plane of the wall face. It is recommended that a relatively short pipe stub be extended from manhole or other wall faces, however, in no case will exposed reinforcing steel be permitted at such structures.

3.5 TESTING AND ACCEPTANCE

A. The Contractor shall cooperate and furnish all equipment, labor, and assistance necessary to perform testing required by the Engineer unless otherwise specified.

B. Upon completion and after backfill, the Engineer shall conduct a Mirror Test. The test will be accomplished by flashing a light from one end upon a mirror on the other end to check for poor alignment, misplaced pipe or other defects.

C. The Owner reserves the right to perform an internal television inspection of the lines installed under this contract. Television inspection equipment will be supplied by the Owner.

D. All defects found shall be repaired or replaced by the contractor, at his expense, to the full satisfaction of the owner prior to acceptance.

3.6 METHOD OF MEASUREMENT

A. This item of work will be measured for payment in place, for the actual length of pipe installed, complete from inside wall face of structure to structure.

B. No extra allowance will be made for cutting of pipe or excess pipe.

END OF SECTION

SECTION 029300

TURF AND GRASSES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Work shall consist of the temporary seeding required for erosion control purposes and the permanent seeding and sodding required to restore and stabilize all areas disturbed by construction activity that are not required to be paved. Contractor shall apply seed, sod, limestone, fertilizer, mulch, mulch anchoring, water, and other items incidental thereto and required for a complete installation.

B. Restoration involves the repair or replacement of all items disturbed by construction except those items specifically indicated by the Engineer to be removed. Restoration when complete should render the disturbed area equal to or better than its original condition prior to construction.

C. All lawn areas disturbed shall be seeded or sodded as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Soil Erosion and Sediment Control - Section 021200

1.3 SUBMITTALS

A. Manufacturer's Test Reports - Submit certificates for the following:

1. Certificate of Sod.
2. Certificate of Seed.
3. Certification of Bulk Fertilizer.

1.4 REFERENCE STANDARDS - Comply with the following:

A. Association of Official Seed Analysts.

B. American Sod Producers Association (ASPA) "Guideline Specifications to Sodding"

C. Pennsylvania Department of Transportation (PennDOT) Publication 408, "Specifications", latest edition.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. Onsite Topsoil: Onsite soil material from the top 6 inches of ground surface, as available in stockpiles, and as approved by Engineer.

B. Offsite Topsoil: If on-site topsoil is insufficient in quantity to provide specified thickness, provide topsoil from approved off-site sources as required to complete the work. Off-site topsoil shall meet the following minimum requirements.

1. Topsoil shall be fertile, friable, well drained, pH range of 6.0 to 6.5, free of sub-soil, toxic substances harmful to plant growth without clay lumps, stones, roots or debris. Analysis of content shall be as follows:

Sand	-	35% to 40%
Clay	-	15% to 20%
Organic Matter	-	2.5%
Silt	-	Balance

2. Test off-site topsoil by a soils testing laboratory retained and compensated by the contractor and approved by the engineer and submit copy of test report for approval by the engineer.

2.2 SEED

A. Seed shall conform to applicable State and Federal regulations and to test provisions of Association of Official Seed Analysts. Seed shall be mixed and delivered in clean, sealed bags bearing certified analysis. Submit certificates of analysis for approval.

B. Seed mix shall be in conformance with the drawings.

2.3 SODDING

A. General

1. This work shall consist of furnishing, placing and maintaining cultivated sod on designated areas in accordance with these specifications and within reasonably close conformity to the lines and dimensions shown on the contract drawings or as directed by the Engineer.

B. Materials

1. Sod: Provide strongly rooted sod, not less than two (2) years old and free of weeds and undesirable native grasses. Provide only sod capable of growth and development when planted (viable, not dormant). Provide sod composed principally of the following:

Spreading Fescue	Fortess	30
Chewings Fescue	Banner	30

Kentucky Bluegrass	Kenblue	30
Perennial Rye	Manhattan	10

2. A sample of the sod to be installed shall be supplied to the Owner or his authorized representative for approval prior to delivery.

C. Construction Requirements

1. Sod shall be cut in rectangular sections measuring twelve (12) inches to twenty-four (24) inches wide and two (2) feet to six (6) feet long in order to permit handling without tearing or breaking. The thickness of the section shall be approximately 3/4 inch.
2. If the grass is longer than two (2) inches, it shall be mowed to a height of one and one half (1½) inches prior to removal of the sod. All sod shall be in a well-moistened condition when delivered to the site.
3. All sod shall be placed within forty-eight (48) hours after being cut. Should temporary storage be required, sod shall be protected from direct sunlight and drying. Dried-out sod will not be accepted.
4. Prior to placing any sod, all grading and soil preparation shall have been completed as previously specified. Soil shall be moist prior to placing sod.
5. Sod shall be placed at times when moisture and temperature conditions are suitable. Sod shall not be cut or placed when the temperature is lower than thirty-five (35) degrees Fahrenheit.
6. Sod shall be carefully placed by hand with tight joints and no overlap. Pitchforks or other tools which tend to damage to sod shall not be used and dumping from vehicles will not be permitted. Transverse joints shall be broken or staggered. All sod shall be thoroughly watered to the point of saturation immediately after placing.
7. After watering, the sod shall be sufficiently tamped with an approved tamper to close all joints and insure close contact between sod and sod bed. After tamping, the sod shall present a smooth even surface, free from bumps and depressions. If so directed, a light roller, weighing not more than sixty-five (65) pounds per foot-width, shall be used to complete firming and smoothing the sod. On all slopes, sod shall be placed with the long axis parallel to the contour starting at the bottom of the slope. Joints shall be staggered.
8. In ditches and on slope areas, each strip of sod shall be staked securely with at least one (1) wood stake for each two (2) square feet of sod. Stakes shall be one-half (½) inch by one (1) inch with a length of eight (8) to twelve (12) inches as directed. Stakes shall be driven flush with the top of the sod, and with the long face parallel to the slope contour.

2.4 LIMESTONE - Ground agricultural dolomitic limestone, 90% calcium carbonate equivalent, conforming to standards of Association of Official Agricultural Chemists and applicable State and Federal regulations.

2.5 FERTILIZER - Conforming to standards of Association of Official Agricultural Chemists, delivered in sealed and labeled bags, or in bulk with certification as to quality and analysis.

Nitrogen source shall be at least 33% water insoluble. Fertilizer shall have the following formulations:

- Basic Fertilizer - 0-20-20.
- Starter Fertilizer - 10-18-10.
- Hydroseeding - 10-10-10.

2.6 SOIL STABILIZING AGENT - For use in hydroseed mix only. Material shall be equal to one of the following:

- "Verdyol Complex" - Weyerhaeuser Company.
- "Curasol" - Wolbert Master Associates.
- "Terra-Tack" - Grass Growers, Inc.
- "J-Tac" - Reclamare Company.

2.7 MULCH MATERIAL

A. General Use - Straw, salt marsh hay, or a combination of both. Material shall be reasonably weed free, not brittle or overly decomposed.

B. For Hydraulic Seeding - Wood cellulose fiber mulch, containing nontoxic green dyemarker.

2.8 MULCH ANCHORAGE MATERIAL - Conform to requirements of Section 805.2 of the PennDOT specifications except that asphaltic binders are not allowed.

PART 3 - EXECUTION

3.1 LANDSCAPE WORK

A. Furnish all labor, supervision, materials and equipment to do all grading, topsoiling, seeding and sodding of the areas disturbed by construction.

B. Only material that is acceptable to Engineers shall be used to do finish grading. Fills shall be carefully made, solidly compacted, and graded to walks and roadways. All excess excavation not required for grading shall be removed from the site.

C. Upon completion of finish grading, topsoil shall be spread to a finished six (6) inch minimum depth.

D. During all operations following topsoil spreading, surface shall be kept free from stones over one and one half (1½) inch in size or any rubbish, debris, or other material which will be detrimental to seeding or to maintenance.

E. No separate payment will be made for landscape restoration work, the cost thereof being included in the prices bid.

3.2 PREPARING TOPSOIL

A. Existing On-Site Topsoil for Fine Lawn Areas - Incorporate the following materials uniformly throughout the entire depth of topsoil by discing, rototilling, or other approved method, except starter fertilizer which shall be spread uniformly to the surface and raked into the soil.

1. Limestone - As specified on drawings.
2. Starter Fertilizer - As specified on drawings.

B. Off-Site Topsoil Fine Lawn and Temporary Lawn Areas - Incorporate the following materials uniformly throughout the entire depth of topsoil, except starter fertilizer which shall be spread uniformly to the surface and raked into the soil.

1. Limestone - As specified on drawings.
2. Starter Fertilizer - As specified on drawings.

C. Add starter fertilizer to surface of seed bed. Rake or drag smooth to final grade elevations, roll if necessary to stabilize in order to commence seeding. Remove ruts, mounds, and ridges on surface of topsoil. All stones, roots, or other debris greater than 1 inch visible on the surface shall be removed. Resulting holes shall be filled with specified topsoil, leaving a uniform planer surface. Contractor shall grade uniformly so soil surface does not have low spots which may collect water.

D. Seeding operation shall take place while topsoil is in friable, loose condition, with no crusting of the surface.

3.3 SEEDING

A. Seeding shall be done between the following dates.

1. Permanent Seedings - As specified on drawings.
2. Temporary Lawns - As soon as possible for Erosion Control purposes.

B. Seed during favorable weather conditions. Prepared bed shall be in moderately dry condition during seeding.

C. Sow the seed mix at the rates indicated on the drawings.

D. Sowing may be by the following optional methods:

1. Mechanical Power-Drawn Seeder - Combination grass planter and land packer or pulverizer. Plant seed not deeper than l/4 inch. Keep seeding operation as close as possible to the contours and not up and down slopes. After seeding, compact with land roller, such as a cultipacker. With proper equipment, sowing seed and cultipacking in one operation is satisfactory.
2. Hopper Type Spreader - Manually-propelled or power-drawn hopper devices. Uniformly distribute the seed by sowing half the seed in one direction and the

remainder at right angles to the direction of the first sowing. Cover seed an average depth of 1/4 inch by means of chain harrow, cultipacker, or other approved method.

3. Hydroseeding - Hydraulic broadcasting of prepared material are as follows:

   a. With written approval of the Engineer.
   b. Water - As Specified.
   c. 1,500 pounds of wood cellulose, plus l5% for slopes 5% and steeper.
   d. 2.75 tons of lime.
   e. 0.87 pounds of fertilizer.
   f. Soil stabilizer of type and at rate recommended by the manufacturer.
   g. Seed Mix - As specified.
   h. For a 3,000 gallon tank, multiply these quantities by 0.75. Mix and agitate all materials, except wood cellulose, in 2,200 gallons of water; then add wood cellulose, fill tank with water and continue the agitation. Seed promptly, under constant agitation of the mix, beginning when the complete mix is a uniform slurry. Limit coverage for the 3,000 gallon tank to 0.75 acre.
   i. Take precautions against overspray onto roads, curbs, sidewalks, building walls, and other surfaces except the ground areas. Contractor shall promptly clean all areas of overspray to the satisfaction of the Engineer.

E. For temporary seeding work, add to topsoil the lime, peat and basic fertilizer, as specified, and finish surface of topsoil reasonably smooth. At time of permanent seeding, turn over the temporarily seeded areas by discing, to kill the grass and weeds. Smooth and fine grade the surface, add starter fertilizer and follow with the permanent seeding work. Option - Temporary seeding may be done by hydroseeding method, including mulch and soil amendments.

3.4 SODDING

A. Provide sod in areas on slopes steeper than three horizontal to one vertical, within drainage swales, and in residential lawn areas as directed by the Engineer. Sod shall also be placed on the uphill edge of all walks parallel to slopes in excess of 8%.

B. Place sod on prepared topsoil bed as herein before specified for seeded areas. At the time sod is placed, topsoil shall be in a damp, friable, loose condition, with no surface crust.

C. Retain sod on slopes steeper than three horizontal to one vertical and in swales, using wooden pins driven into sod until top is flush with sod.

D. In placing sod, keep rows parallel with contour lines. Keep the work true to finished grade, and tamp or roll to establish firm contact with the topsoil bed. Butt the pads tightly and stagger ends with those in adjacent rows. If sod separates, backfill with topsoil flush with sod and over seed.

3.5 MULCHING

A. Except hydroseeded areas, seeded areas sloped four horizontal to one vertical or greater and areas where lawn would be difficult to establish, shall be mulched at rate of 3 tons per acre.

B. Wood fiber mulch or soil stabilizing agents may be used, hydraulically applied in water at rate of 1,500 pounds of wood fiber per acre, plus 15% on slopes greater than four to one.

C. For dry-mulched areas, spray with anchorage material immediately after spreading the straw or salt marsh hay or both, in accordance with Section 805.3 of the PennDOT Specifications, in a method to bind the mulch to the soil and inhibit wind loss of the mulch. Do not apply anchorage material within 30 feet of building lines. Clean off misplaced spray from building walks, paving, light standards and bases, and other surfaces to the satisfaction of the Engineer.

D. Winter Weather Mulching

1. When winter weather prevents immediate establishment of permanent lawn cover, mulch the soil.
2. Use any of the following mulches at the rate stated per acre.

   Straw ..... 3 tons

   Cornstalks, shredded or chopped to lengths
   6 inches to 8 inches ..... 4 to 6 tons

   Wood chips, minimum 2 inches depth of mulch

3. All mulches, except wood chips, shall be tucked into the soil about 3 inches by use of disc or other pull-type power equipment.
4. After mulch has afforded winter protection, it shall either be removed or worked into the soil.

3.6 WATERING

A. Water shall be supplied by Contractor.

B. Keep newly seeded and sodded areas moistened until the grass becomes well established.

C. In event of insufficient rainfall, moisten areas every two or three days until the height of the grass is two (2") inches above grade. Thereafter, water in absence of rain every seven to ten days. When watering sod, make sure that water soaks through the sod into the topsoil bed below.

3.7 PROTECTIVE WORK

A. Provide incidental materials and work necessary to protect the work from damage. Prevent damage to property during these operations.

B. Protective work shall include wire line and stakes along walkways with cloth strips at 4 feet intervals as evidence of the wire and also "KEEP OFF" signs.

C. Defer work when continuation of construction work must occur over certain lawn areas.

3.8 MAINTENANCE PRIOR TO ACCEPTANCE

A. Maintain all seeded and sodded areas by properly mowing, watering, weeding, and similar care to keep the work in a clean and neat condition at all times.

3.9 CONDITIONS OF ACCEPTANCE

A. When average height of grass is about two and one half (2-1/2) inches it shall be cut to a height of one and one half (1-1/2) inches with approved mowing equipment, and at that time, any depressions or other irregularities in lawn surface shall be leveled and reseeded. Contractor's maintenance shall cease after third cutting, provided all areas are grassed and free from bare spots or large "off color" areas.

END OF SECTION

SECTION 030130

CONCRETE - BUILDING

PART 1 WATER-BASED CONSOLIDANT FOR STABILIZING STONE MORTAR - CONPROCO, START

1.1 LOCATION

A. Only if necessary. Consolidating and Stablizing existing stone mortar prior to joint parging or restoration, only if joints found soft and powdered.

Rep - Van Burriss

Description - Basis of Design: Conproco, Start, A water-based consolidant, used to stabilize and strengthen concrete, masonry and stone.

Preparation - Remove loose and deteriorated materials, laitance, dirt, dust, oil and any surface contaminants that will inhibit proper penetration.

- Protect adjacent areas from overspray.

Application - Throughly saturate the surface to ensure adequate penetration. For horizontal application apply liberally and brush out to eliminate ponded material. Additional coats can be applied with the previous treatment is dry to touch.

- Allow 12 hrs to cure. No curing procedures required.
- Clean windows with glass cleaner immediately.

Refer - Mnfr's specifications & Installation Instructions.

PART 2 INJECTION GROUT, CEMENTITIOUS REPAIR GROUT FOR HAIRLINE TO 3/4"

2.1 LOCATION

A. Only if necessary. Secure and stabilize stone masonry at thru-wall cracking.

Rep - Van Burriss

Description - Basis of Design: Conproco, Injection Grout. Cementitious repair grout design for reiair of cracks ranging form hairline to 3/4".

Application - Injected via drilled injection ports as per mnfr's instructions & based upon direction of the crack.

Refer - Mnfr's specifications & Installation Instructions.

END OF SECTION

SECTION 033010

CONCRETE – SITE

PART I GENERAL

1.1 WORK INCLUDED

A. Furnish all plant, labor, supervision, materials and equipment to do all plain and reinforced concrete work shown on drawings or herein specified. All work shall be done in accordance with ACI 318 "Building Code Requirements for Reinforced Concrete" and ACI 301, "Specification for Structural Concrete for Buildings". Unless otherwise specified, all references to standards and codes shall be the latest revision to date.

1.2 SUBMITTALS

A. Submit information on concrete mix design showing composition of all mixes. Show materials, admixtures, ratios, compressive strength, slump and mix design in accordance with ACI 318.

B. Laboratory Test Results

1. Testing laboratory shall submit the results of tests performed on materials used in the concrete.
2. Concrete Mix Design:

a. Testing laboratory shall submit test results of laboratory trial batches run to determine concrete mix proportions if such trial batches are run.

3. Testing laboratory shall submit results of field tests and laboratory tests performed on concrete during construction. Number and frequency of tests shall be as specified in Part 3, Paragraph 3.04. Results from 7-day test shall be submitted as soon as they are available.

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.

PART 2 PRODUCTS

2.1 PORTLAND CEMENT

A. Portland cement shall be Type I conforming to ASTM-C150, "Standard Specifications for Portland Cement".

2.2 FINE AND COARSE AGGREGATE

A. Fine and coarse aggregates shall conform to ASTM C33, "Standard Specifications for Concrete Aggregates".

2.3 WATER

A. Water shall be potable and free from injurious amounts of oils, acids, alkalis, salts, organic materials or other substances that may be deleterious to concrete or steel ASTM C94.

B. Water to cement ratio shall be 0.45 maximum.

C. Water will not be permitted to be added to concrete after being mixed at the batch plant.

D. If increased slump is required, use approved high range water reducers in the design mix.

2.4 ADMIXTURES

A. General:

1. Admixtures shall be free of all chlorides.

B. Water Reducing Type:

1. Conform to ASTM C494, Type A.
2. Conform to manufacturer's recommendations for use.
3. Technical assistance of the manufacturer's field representative shall be furnished upon request.

C. Air-Entraining Type:

1. Conform to ASTM C260.
2. Conform to manufacturer's recommendations for use.
3. Technical assistance of the manufacturer's field representative shall be furnished upon request.

4. Testing of air-entraining admixtures shall conform to ASTM C233.

D. Other Admixtures: Used only with Engineer's written concurrence.

1. Water Reducing, Retarding Type: Conform to ASTM C494, Type D.

2.5 CONCRETE QUALITIES

A. Compressive Strength: Minimum 28 day compressive strength = 4,000 psi for all construction unless otherwise specified.

B. Slump:

1. Maximum Slump: 4 inches
2. Maximum Slump for Concrete Containing High-Range Water-Reducing Admixture: 8 inches after admixture is added to concrete with 1- to 2 inch slump.

C. Air content: per ACI 318.

D. All concrete shall contain entrained air in accordance with ACI 318.

2.6 MIX PROPORTIONS

A. Concrete shall conform to ACI 211.1 and ACI 301, "Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete" and ACI 304R, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".

B. Mix proportions for all concrete unless otherwise specified shall be selected preferably on the basis of field experience, but in the case where sufficient or suitable strength test data is not available, concrete shall be proportioned on the basis of laboratory trial mix design.

C. There shall be adequate workability and proper consistency to permit the concrete to be worked readily into the forms and around reinforcement under the conditions of placement to be employed without excessive segregation or bleeding.

D. Ready-mix concrete shall be used and shall conform to ASTM C94, "Standard Specifications for Ready-Mixed Concrete".

2.7 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

2.8 FABRICATING REINFORCEMENT

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

PART 3 EXECUTION

3.1 MIXING AND PLACING CONCRETE

A. Preparation of Equipment and Place of Deposit

2. Before concrete is placed, all equipment for mixing and transporting the concrete shall be clean, all debris and ice shall be removed from the spaces to be occupied by the concrete, and the reinforcement shall be thoroughly clean of ice or other deleterious coatings.
3. Water shall be removed from the place of deposit before concrete is placed unless a tremie is to be used or unless otherwise permitted by the Engineer.
4. All laitance and other unsound material shall be removed from hardened concrete before additional concrete is placed.

B. Mixing of Concrete

1. Concrete Mixed at Plant off Job Site:

a. Water may not be added to concrete after truck has left the plant.
b. Ready-mixed concrete shall be produced and delivered conforming to ASTM C94 as applicable.
c. Contractor shall furnish Engineer with a concrete delivery ticket for each load of concrete. The ticket shall have the following information recorded:

- Ticket number
- Time batched
- Time arrived on jobsite
- Amount of concrete (by volume)
- Mix Number

C. Conveying

1. Concrete shall be conveyed from the mixer to the place of final deposit by methods which will prevent the segregation or loss of materials.
2. Conveying equipment shall be capable of providing a supply of concrete at the site of placement without interruptions sufficient to permit loss of plasticity between successive increments.
3. Aluminum conveying equipment shall not be used.

D. Depositing

1. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. The concreting shall be carried on at such a rate that the concrete is plastic at all times and flows readily into the spaces between the bars. No concrete that has partially hardened or has been contaminated by foreign materials shall be deposited in the structure, nor shall retempered concrete or concrete which has been remixed after initial set be used unless approved by the Engineer.
2. After concreting is started, it shall be carried on as a continuous operation until the placing of the panel or sections is completed except as permitted or prohibited by ACI 318. The top surface of vertically formed lifts shall be generally level.
3. Consolidation of Concrete:

    a. Consolidate concrete in conformance with ACI 309, "Recommended Practice for Consolidation of Concrete".

4. Time Requirements:

    a. Place concrete at a sufficient rate to assure that lifts below have not taken initial set before fresh concrete is deposited.
    b. Concrete which has partially set shall not be retempered but shall be discarded.

E. Curing

1. Concrete shall be cured in accordance with ACI 308, "Standard Practice for Curing Concrete". Method and duration of curing are subject to approval by the Engineer.

F. Cold Weather Requirements

1. Concreting shall be done in accordance with ACI 306R "Recommended Practice for Cold Weather Concreting". Recommendations shall be considered as mandatory.

G. Hot Weather Requirements

1. Concreting shall be done in accordance with ACI 305R, "Recommended Practice for Hot Weather Concreting". Recommendations shall be considered as mandatory.

3.2 DETAILS OF REINFORCEMENT

A. Surface Conditions of Reinforcement:

1. Metal reinforcement at the time concrete is placed shall be free from mud, oil, or other coatings that adversely affect bonding capacity.

B. Splices:

1. All rebar splices shall be Class B, unless otherwise indicated.

3.3 FINISHES

A. Concrete finishes shall be as specified and as defined in ACI 301.

3.4 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.

3.5 TESTING

A. Laboratory Testing of Materials for Use in Concrete:

1. The Engineer may perform laboratory tests of materials proposed for use in the production of concrete and to determine mix proportions when laboratory trial batches are required.

END OF SECTION

SECTION 040140

STONE RESTORATION

1. STONE RESTORATION

1.1. REPOINTING FOR STONE - CONPROCO, REPOINT

LOCATION

- If necessary, Repointing of existing and repair and patching infill of stone masonry joints to match historic existing.

REPRESENTATIVE

- Van Burriss

DESCRIPTION

- Basis of Design: Conproco, RePoint, for use with brick, brownstone, sandstone, limestone, terracotta, cast stone and other masonry substrates.
- Meets ASTM C387 and C270 for the respective strength of Type O or Type N mortars.

  O: >350psi. N: >750psi.

PREPARATION

- Remove existing damaged or missing mortar 2 to 2 1/2 times width of joint. Caution to not damage adjoining masonry.
- Rinse joints with jet of water or brush or blowing with air.
- Joints should be damp. Saturated with no standing water (SSD). If masonry is extremely adsorbent, provide continual water mist for a few hours prior to repointing.

CURING

- Maintain damp with fine mist for 24hrs.
- Protect from direct sunlight, wind, precipitation, and frost during curing.

REFERENCE

- Manufacturers specifications & Installation Instructions.

1.2. CEMENTITIOUS TINTED REPAIR MORTAR

LOCATION

- If necessary. Rebuilding of broken cast-stone, if any.

REPRESENTATIVE

- Van Burriss

DESCRIPTION

- Basis of Design: Conproco, Matrix (MIMIC). A colored cement-based repair mortar formulated to match the appearance and physical characteristics of the masonry substrate. Designed for use on substrates like brownstone, sandstone, brick, limestone, terracotta and cast stone.

PREPARATION

- Treat structural cracks.
- Remove loose and deteriorated material, laitance, dirt, dust oil and any surface contaminants that will inhibit proper bond.
- Saw cut edges that a diamond blade at 90d angle to eliminate feather edging. Avoid polishing the edges as this will inhibit bond.
- Avoid bruising or micro cracking during surface preparation.
- Repair zone minimum of 1/2" deep.
- Avoid ling, narrow repairs.
- Rust from embedded metal and steel to have ECB anti-corrosion coating.
- Saturate substrate with clean water (SSD) no standing water.

PRIME

- Primer with bond coat of Matrix. Apply repair mortar while plastic bond coat, otherwise remove and re- apply.

APPLICATION

- Force Matrix against the edges of the repair working in one direction. Overbuild by 1/4".
- Shave to final form and finish texture.

CURING

- Maintain hydration per ACI 308R-01.
- Protect from direct sunlight, wind, precipitation, and frost during curing.

REFERENCE

- Manufacturers specifications & Installation Instructions.

END OF SECTION

SECTION 040523

MASONRY ACCESSORIES

1. MASONRY ACCESSORIES

1.1. COPPER FLASHING DRIP PLATE, H&B

LOCATION

- Copper projecting drip plate at thru-wall flashing at new or patched stone masonry openings.

DESCRIPTION

- Basis of Design: H&B, DP-Standard Drip Plate, 3" deep, Copper (UON).
- Set in double bead of bedding sealant (urethane UON).
- Trim and overlap joints 3" and double bed-joint.
- Pre-Fabricate inside and outside corners and End Dams, or Optional H&B Corner Pieces and End Dams.

NOTES

- Trim and Grind Soften outside miter corners to reduce source of injury.
- Coordinate with self-adhering thru-wall flashing to extend flashed condition through thickness of wall assembly.

COLOR

- Wash copper with mild acid or vinegar to dull finish.

END OF SECTION

SECTION 061000

WOOD, PLASTICS, AND COMPOSITES

PART 1 ROUGH CARPENTRY

1.1 STANDARD WOOD BLOCKING AND FRAMING

A. Location - Wood framing, furring, frounds, nailers, and blocking.

1.2 PTKD OR KDAT, PRESSURE TREATED KILN DRIED WOOD BLOCKING AND FRAMING.

A. Location - Wood blocking when in moisture contact conditions of exterior walls and roof overhangs.
Description - Also known as KDAT, Kiln Dried After Treatment.
- KDAT, Kiln-Dried After Treatment unless in direct moisture contact. 19% for lumber, 15% for structural panels.

1.3 HISTORIC MATCHING WOOD PTKD

A. Location - Roof Overhang Fascia and Rafter Closure Fascia.
B. Description - Same as PTKD, except shop re-sawn to match rough-sawn face marks. Species match is not necessary.

1.4 COPPER AZOLE PRESERVATIVE WITH BARAMINE WOOD PRESERVATIVE, WOLMANIZED OUTDOOR WOOD, WOLMAN E, MCA-C WITH BARAMINE.

A. Location - Nature of Wood Preservative Treatment utilized in PTKD.
Description - Basis of Design: Wolmanized Outdoor Wood, MCA-C, Copper Azole preservative Type C with Baramine.
- Long-lasting resistance to termites and fungal decay.
- Ideal for deck, retaining walls, fences, picnic tables, planter boxes, walkways, sill plate, structural members.
- Based on retention levels, may be above ground, ground contact, and freshwater immersion applications.
- KDAT, Kiln-Dried After Treatment unless in direct moisture contact. 19% for lumber, 15% for structural panels.
- Use 2; 0.05pcf; Sill Plate, Interior Above Ground.

- UC3A; 0.05pcf; Exterior Protected Above Ground.
- UC3B; 0.06pcf; Exterior Exposed Above Ground.
- UC4A: 0.15pcf; Exterior ground or freshwater contact with low risk.
- UC4B; 0.31pcf; Permanent Wood Foundation Lumber & Plywood, Exterior ground or freshwater contact high potential for deterioration.

Hardware
- Hot dip galvanized or StStl 304 or 316.
- Aluminum Alloy 3015 or similar may be used in contact with MCA-C above ground that are damp or intermittently wet. If immersion or frequent or prolonged wetting, then factory coat alum or insulating resistant barrier.

1.5 MOLD-RESISTANT SURFACE PRE-TREATMENT, LONZA, FRAMEGUARD

A. Location - Mold-Resistant pre-treatment of existing wood at exterior wall and overhang conditions.

Description
- Water-based surface treatment.
- Not intended for sill plate where pressure-,treated is required, unless historic concondition where not being replaced.

1.6 PLY – PLYWOOD

A. Location
- Structural Subfloors & Roof Decks where noted.
- Blocking & Sheathing where noted.

B. This Materials Legend and Outline Specification is to be used in conjunction with the full specifications of selected sections (if any).
C. This document takes precedence over the full-spec for material selection.
D. The full specification, if any, takes precedence for quality control, submission requirements, warranty.
E. The default for specification and material legend overlap is to select for greater quality or greater quantity.

END OF SECTION

SECTION 070500

COMMON WORK RESULTS FOR THERMAL AND MOISTURE PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordinate Preinstallation Conference
B. Selected products options shall be from within the same manufacturer's 'family' and to maintain coordinated warranty.
C. For each Division 7 material, Provide 2' x 2' full-size mock-up within real assembly for review and approval prior to continuing work. This assembly may need to be re-worked or removed and replaced pending nature of review. Assembly to show typical condition and various joints and transition conditions.
D. Coordinate with manufacturer for localized inspection in installation and at attendance at pre-installation conference and at review of mock-ups, and at during work installation, and at completion of work for Warranty.
E. Provide confirmation of warranty and completed forms with all inspection reports.
F. All Division 7 work to be performed in manufacturer recommended manner by certified installers. Submit credentials at pre-installation conference.

PART 2 MNFR'S JOINT DETAILS

2.1 SECTION INCLUDES

A. The mnfr and the Contractor will review each joint condition and submit to the Architect large scale joint detail, or selecting a typical mnfr's detail to reference.

PART 3 GENERAL

3.1 SECTION INCLUDES

A. Coordinate Preinstallation Conference
B. Selected products options shall be from within the same manufacture's 'family' and to maintain coordinated warranty.

PART 4 SHOP DRAWINGS

4.1 SECTION INCLUDES

A. Provide shop drawing along with material literature and sample submission for each item.
B. Locate extent of each item and show integration of one item to the next. Show terminations and transitions.
C. Provide chemical compatibility from mnfr at each location.

PART 5 QUALITY STEPS

5.1 SECTION INCLUDES

A. Provide adhesion test on in-place mock-up.
B. Provide pre-construction conference with all related design, construction, testing, and mnfr parties. Minute this meeting.
C. Document each field observation by the mnfr and final warranty observation.
D. Provide final completed warranty with log of all quality steps.

END OF SECTION

SECTION 071352

MODIFIED BITUMINOUS SHEET WATERPROOFING

PART 1 SHEET WATERPROOFING MEMBRANE, MODIFIED ASPHALTIC SHEET MEMBRANE- CCW

1.1 SA SHEET MEMBRANE OPTION

Exterior side of New and Existing Foundations. New foundations full-height. Existing foundations from 6" below grade and down 24" only.

CCW - Van Burriss, (610) 429-5253

Description - Basis of Design: Carlisle Waterproofing, CCW, Miradry, 860/861 Self-Adhering Sheet Membrane Waterproofing.

- Also Acceptable: Henry, GCP
- 860 is Summer Grade. 861 is Winter Grade.

Primer - CCW-702LV, Contact adhesive/primer.

Fluid Flashing - CCW LM-800XL. Caulk-like accessory for use at inside corners, terminations and other detailing.

Term Bar - CCW Sure-Seal Termination Bar. Term bar for use at grade line termination. Not needed if in cavity tie-in to air barrier. May also be substituted with stainless steel fastener and large-headed washer at 8"oc.

Drain Mat - CCW MiraDrain 6200, Vertical drainage composite/protection course.

Notes - CCW Thru-wall flashing at crossing masonry bearing conditions.

Notes - Provide pad of detailing self-adhering flashing tape below masonry tie-backs, if any.

- Extend WP 8" above Floor Line or Above Grade Line and Connect to AWB.
- Extend WP 8" onto Floor Slab below Floor Plate or Glazing Systems.
- At paving stone door thresholds. Extend on concrete foundation and rough threshold opening prior to installing paving stones. Terminate at interior with stainless steel or plastic 2" upturned back dam and connect to rough jamb upturn to 6" above finished floor line.
- Owens Corning Foamular 250 (25psi) can be used as perimeter insulation.
- Owens Corning has reciprocal arrangement with CCW and may be purchased through CCW.

END OF SECTION

SECTION 071400

FLUID-APPLIED WATERPROOFING

PART 1 FOUNDATION WATERPROOFING, FLUID APPLIED - CCW

1.1 FLUID-APPLIED MEMBRANE OPTION.

Location - Fluid-Applied Membrane Option. Exterior side of New and Existing Foundations. New foundations full-height. Existing foundations from 6" below grade and down 24" only.

Description
- Basis of Design: CCW, Barricoat-R, Roller
- Also Acceptable: Henry, GCP
- Liquid Roller Applied Rubberized Asphalt.
- 60 Mill Total, 30Mil First Coat, Fabric Inlay, 30Mil Top Coat

Notes
- Overlay w/ Drainage Mat
- Repoint and Parge Existing Foundation Prior to Application of Waterproofing.
- CCW Thru-wall flashing at crossing masonry bearing conditions.
- Provide pad of detailing self-adhering flashing tape below masonry tie-backs, if any.
- Extend WP 8" above Floor Line or Above Grade Line and Connect to AWB.
- Extend WP 8" onto Floor Slab below Floor Plate or Glazing Systems.
- At paving stone door thresholds. Extend on concrete foundation and rough threshold opening prior to installing paving stones. Terminate at interior with stainless steel or plastic 2" upturned back dam and connect to rough jamb upturn to 6" above finished floor line.

Warranty - 10 Years Labor and Material Warranty, Provide Necessary QC Inspections by Mnfr or Approved Third-Party.

Limitations
- Cover within 30days.
- Not compatible with silicone, coal tar, plasticized PVC.
- Do not apply solvent-based products over Barricoat-R

2.1 WATERPROOFING ACCESSORY SEALANT - CCW

Location - Cant fill, Joint Sealant behind Expansion Joints, CCW typical Details.

Description - Basis of Design: CCW-201 Sealant.

Rep - Van Burriss, (610) 429-5253

END OF SECTION

SECTION 071600

CEMENTITIOUS AND REACTIVE WATERPROOFING

PART 1 CAPILLARY/CRYSTALLINE SLURRY, POSITIVE OR NEGATIVE SIDE WATERPROOFING OF CONCRETE STRUCTURES - CONPROCO

A. FLUID-APPLIED MEMBRANE OPTION.

- Interior face of repointed and parged existing basement stone masonry and mortar walls.

Rep - Van Burriss - Capricorn Sales.

Description - Basis of Design: Conproco, Conpro Super Seal, Spray or Bruch Applied, Capillary/Crystalline Slurry. Polymer-modified cementitious waterproofing.

- Positive or negative side waterproofing of concrete structures.
- 2 coat will with stand 57ft hydrostatic.
- Permanent, non-reversable, chemical reaction develops crystaline structure in capilaries that block liquid phase water.
- Resistant to deicing salts, chloride, chemical attack.
- Breathable.
- pH: >12.
- Application temp >45F for 24hrs. Protect from rain and high-wind for 8 hours.

Preparation - Grind or abrasive blast (CSP3) concrete to achieve an open-pored surface.

Active Leaks - ConproPlug

Weaping Water- ConproStop

1st Coat - 50mil work into substrate to vill voids and pores.

2nd Coat - 60mil once the first coat is thumb-print hard.

Cure - Mist Cure 3-4times daily for 3 days. Or wet burlap & poly cover.

Notes - Repoint and Parge Existing Foundation Prior to Application of Waterproofing.

END OF SECTION

SECTION 072113

BOARD INSULATION

PART 1 PERIMETER INSULATION

1.1 INSULATION

A. Perimeter Insulation

Location - Foundation perimeter insulation at new and existing conditions.
Description - Basis of Design: Dow or Approved Equal
- CavityMate Plus, 25psf, 2" x 24".
- 2" = R10.
- HCFC Free
- Square Edge
Notes - Top Edge at 6" Below Grade.

B. XPS Cavity Insulation

Location - Jamb and Head Returns
Rep - Joe Lazorick @ Thomco
(302) 559-4561
Description - Basis of Design: Dow Cavitymate-Plus, 25psi Compressive Strength.
- 1" Thick
- R5.0/Inch.
- Flame Spread FS15, Smoke Developed SD165.
- Water Absorption % by volume: 0.3%.
- Water Vapor Permeance: 1.5perm (dry cup)
- Board Size: 16" x 96", Square Edge.

C. 2" Continuous ISO Sheathing, VR – Dow

Location - Attic and roof rafter insulation.
Rep - Joe Lazorick @ Thomco
(302) 559-4561
Description - Dow
Insulation - Basis of Design: Dow Thermax Sheathing (ci), 25psi minimum. Glass-fiber -reinforced Polyisocyanurate Insulation with Aluminum facings front and back.
- Fiberglass Reinforced Core. (Saw Cutting Reqd).
- 1.0 mil silver aluminum foil exterior facing; 1.0 mil aluminum foil interior facing.

- It can be installed exposed to the interior without a thermal barrier.
- 2" = R13
- Exposed to rain cavity, UV exposure to 6 months.
- Compressive strength, ASTM C518. 25psi.
- Water absorption, ASTM C209: <0.1%.
- Water vapor Pereance, ASTM E96: <0.3.
- Complies with ASTM C1289: Type 1, Class 2.
- Flame Spread, ASTM E84: FS25.
- Smoke Developed, ASTM E84: <450.
- Panel Size: 48" x 96 or 144. 2", 2.5", 3" Available.
- Fasten as a part of complete assembly
- Integral interior and exterior aluminum facings bonded to polyisocyanurate rigid foam insulation.

Joints
- Horizontal joints ship-lapped with spray foam sealant on interior half within joint.
- Vertical joints supported by structural stud framing. Joints to be but jointed with spray foam sealant on interior half within joint.

END OF SECTION

SECTION 072129

SPRAYED INSULATION

PART 1 PERIMETER INSULATION

1.1 INSULATION

A. Spray Foam Gap Fill & Seal

location - Joint crack fill at perimeter of exterior windows and doors

Description - Spray polyurethane foam, closed cell, FS-25
- Maximum expanding where noted
- Minimally expanding at window gap fill or where noted.
- Dow, Hilti, Tremco or 3M

notes - Select Expansion Rate for Application and Brace Assembly as necessary

B. SPF: Spray Urethane Foam Insulation, Closed-Cell, 2# Density, FS25 - Demilec Heatlok Soy

Location - 3 1/2" R21 at Interior Back-side of wood sheathing. 2", R9.5min at Interior Back-side of stone masonry.

Description - Basis of Design:Demilec (USA), Heatlock Soy 200 Plus Spray-applied Polyurethethane Foam Insulation.
- Also Acceptable: BASF WallTite, JohnsManville, Carlisle Building Materials.
- R6.7/inch with <4" thick
- Air permeabe @ 1.5".
- Vapor Permeance: <1perm when 1.2"; Class 2 Vapor Retarder.
- Closed Cell; 2# Density;
- Water Absorption by % of Weight: 0.6%.
- Flame Spread: FS<25; Smoke Developed: SD <450.

Thermal Barrier - Per building code, provide 15min intumescent barrier if not covered by GWB prior to final completion and occupancy.
- BlazeLok TBX , One-Coat, 17 wet mils (11dry mils)
- DC 315 Coating, 18 wet mils (12dry mils)

Note - Install per mnfr's instructions for moisture content of receiving wall.
- Clean receiving surface of surface dirt/dust.
- Install per mnfr's instructions for ventilation.
- Provide adhesion test on existing stone. If found needing, provide solvent primer.

END OF SECTION

SECTION 072616

BELOW-GRADE VAPOR RETARDERS

PART 1 VAPOR RETARDERS

A. UNDERSLAB VAPOR BARRIER - WR MEADOWS SPRAY FOAM GAP FILL & SEAL

Location	-	Underslab vapor barrier at new concrete slabs on grade.
Mnfr	-	Basis of Design: WR Meadoes, Perminator 15.
	-	Also Acceptable: Stegowrap.
Description	-	15mil, Polyolefin underslab vapor barrier.
	-	Sheets 12' or 15' wide. Overlap side and end laps and seal with 4" Perinator Tape.
	-	Water vapor permeance: 0.0063 per ASTM E-96.
	-	Puncture Resistance: >3200, per ASTM 1709 (B).
Notes	-	Locate below slab and above granular fill.
	-	Terminate at Rising walls and footings to 4" above floor level and tape seal.
	-	Take precautions to not puncture membrane with equipment, tools, structural carriers, etc..

END OF SECTION

SECTION 072719

PLASTIC SHEET AIR BARRIERS

PART 1 VAPOR RETARDERS

A. AIR & WEATHER RESISTANT BARRIER, SHEET APPLIED, VP - 3M

Location	-	New underlayment at total replacement of cedar shingles. Use with vented moisture barrier.
Description	-	3M Air Barrier, #3015VP
	-	Mark Kennedy, CSG, (215) 321-5300
	-	Vapor permeable.
	-	Total Thickness (coated membrane) 15mils.
	-	Vapor Permeability per ASTM E96: 12perm, A, Dry; 17perm, B, Wet.
	-	Surface Burning: FS5; SD0, Class A.
	-	Typ no primer reqd., Confirm w/ pull test.
	-	Front release paper, Adheres directly.
	-	Installation Temp: 0F to 150F.
	-	Withstands Temp: -40F to 240F.
	-	UV exposure to 12 months.
	-	Compatible with most sealant and building materials.
	-	Self-seals if penetrated.
	-	NFPA 285 Compliant as part of assembly.
	-	Non-Asphaltic
	-	Color: White w/ Red Mark. 3" edge Mark to Control Overlap.
Notes	-	Sheathing must have joints >1/4" and penetrations sealed.
	-	Coordinate with AWB to Connect and Shingle Lap with Adjacent Flashings & Terminations.

END OF SECTION

SECTION 074626

WOOD SHINGLE AND SHAKE SIDING

PART 1 SIDING

A. WOOD SHINGLE SIDING

Location	- Complete wall face replacment at wood framed areas and replacement of historic roofing shingles.
Description	- CSSB, Certigrade Western Cedar Shingles, Number 1, Blue Label, 18" length, Rebutted and Rejointed Shingles for sidewall application. - Pressure-Impregnated Treated Products. Locate at the first three bottom courses and the starter course. - Match size, exposure and coursing to existing conditions.
Application	- Install per CSSB and Building Code. - Assure side joint spacing for allowing shingles to expand as per mnfr's instructions. - Assure end and edge spacing as per mnfr's instructions. - Fasten with type 304 stainless steel or hot-dipped galvanized. Do not use electrogalvanized fasteners. - Use type 316 stainless steel if pressure-treated or fire-retardant treated.
Finishing	- Prefinish with Oil based primer sealer and Field-apply two coats of latex based color-color stain to match existing color and final field-applied coating. Treat all cut edges.

B. VENTED MOISTURE BARRIER MEMBRANE FOR CEDAR AND WOOD SIDING

Location	- Overlay new air & weather barrier.
Description	- Obdyke, Cedar Breather, 1/4" open drainage mesh.
Application	- Installed atop WRB or AWB. Do not Overlap joints, Secure per Mnfr's Instructions.

END OF SECTION

SECTION 076100

SHEET METAL ROOFING

PART 1 ROOFING

A. Standing Seam New Metal Roof and Repairs - ATAS, Copper

Location	-	New and patch standing seam copper roof to match existing.
Description	-	ATAS One-Piece Standing Seam on continuous support deck.
	-	Local Rep: Matthew, ATAS, Maryville, TN, 800-468-1441
	-	Basis of Design: ATAS, Dutch Seam One-Piece Standing Seam with Performance Ratings. Custom size to match existing panel width. 16oz true copper (not copper printed).
	-	Also Acceptable: Peterson, Merchant & Evans.
	-	Min 2/12 pitch.
	-	Separate clip to wooden decking and underlayment sheet.
	-	Wind Uplift FM-I-90.
	-	16oz copper.
	-	Custom-sized panel with no stiffening pencil ribs to match existing. Oilcanning will be present.
	-	Full-Length Panels cut to length.
	-	Smooth Finish.
Color	-	Wash copper with mild acid or vinegar to dull finish.
	-	20 Year Watertight Warranty.
Notes	-	Provide Shop Drawings, Installer Certification and Experience.
	-	Provide Matching Trim.
	-	Provide shop drawing showing dimensions at new low sloped valley section.
	-	Review location of copper panel cutting with Architect prior to cutting.
	-	Carefully remove foreign materials that will not allow for proper soldering.
	-	Remove excess film using priper solvent for materials being removed.
	-	Prepare copper roof in repair areas by mechanical means with a wire brush. Remove patina and polish to a bright shiny finish.
	-	Cut copper pans in a manner to maintain the balance of the roof without damage.

- Carefully lift copper pans at cut ends, without damaging the pans to allow counterflashing to be slip under pans a minimum of 12 inches.
- Cut and prepare copper sheet patch to the correct size. Round corners of patch and place over area to be repaired.
- Fabricate pan end covers, slip on pan ends, peen and solder in place.
- Place copper patch over area to be repaired with a minimum of two inches beyond repair target in each direction. Shape and form patch as required to privide a watertight repair.
- Rivet patch to base metal and set rivets 3" oc, staggered 1/2".
- Do not place rivets closer than 3/4" from edge of patch.
- Pre-tin all copper to be soldered.
- Use minimal flux and sweat solder patch to the bade metal.
- Provide soldered tie-in to both the existing copper roof and the new copper roof.
- Draw solder through seams and solder all rivets.
- Remove excess flux and wash area repaired with baking soda and water. Flush throoughly with clean water.

Color - Wash copper with mild acid or vinegar to dull finish.

B. Metal Roofing, Leak Barrier, High-Temp, Roofing Underlayment - ATA

Location - All new copper roofing locations and patched existing conditions.

Description
- High-Temp for Below Metal Roofing. Slip Resistant, UV Stable and Temporary Roof for 60 days.
- ATA-Shield** is the recommended self adhesive underlayment for eaves, sidewall and any critical areas exposed to ice damming and extensive water run off. Available in 65’-8” x 3’ 3-3/8” rolls (200 sq. ft. per roll).
- Optional: Grace Ice & Water Shield - HT,
- Optional: Certainteed Winterguard - HT,
- Optional: GAF StormGuard - HT
- Locate flashing underlayment at 36" along eaves and rakes.
- 12" vertical and 24" horizontal at rising walls and gables.
- 36" at ridge vents and vent units.

C. New Gutters & Downspouts - New & Replace

Location - Provide all new gutters and downspouts.

Description - Provide all gutters with 20oz copper, Half-round, Round Downspout, Adjustable elbows, Copper tie-backs.

- Support and secure gutters and new downspout sections for full loading with ice and snow.
- Slope gutters to downspout locations as per drawings.
- Provide diverters.
- Provide products by one manufacturer. The basis of design for gutters is Berger Brothers.
- Provide 20oz copper half-round, 6" copper gutters where shown on drawings.
- Remove existing gutter hanger brackets.
- Provide new secure hangers with brass screws sized to bracket hole but not less than 5/16" diameter and 1 1/2" length.
- Provide lapped, riveted and soldered seams, miters, end caps, drop outlets and related accessoreis to privide a complete, non-dripping seam guttering system.
- Provide #10 Combination circle and shank with spring clip. Set hanger into each rafter end but not more than 24"oc.
- Provide 4" round copper downspout and back-secured (not strap) to structure not greater than 5' apart.

Color - Wash copper with mild acid or vinegar to dull finish.

END OF SECTION

SECTION 076200

SHEET METAL FLASHING AND TRIM

PART 1 ROOFING

A. Copper 20oz Flashings

Location	-	Roofing Cap and Counter Flashing
	-	Scuppers with Fabricated Shapes and Intersections.
	-	Masonry Drip Flashing
	-	Foundation Line Skirt to hide exposed foundation waterproofing and hold wood shingles 6" above grade.
Description	-	Copper, 20oz.
	-	Soldered or Welded Intersections.
	-	Back Splice Joints and Set in Bedding Sealant, Trim Drip Edge.
Color	-	Wash copper with mild acid or vinegar to dull finish.
Underlayment	-	Provide HT Underlayment if within roofing zone. Provide wall flashing if at wall conditions.

END OF SECTION

SECTION 076526

SELF-ADHERING SHEET FLASHING

PART 1 FLASHING

A. Dual-Faced Self-Adhering 6" Flashing Tape

Location - Wrapping of Window and Door Frame Openings
Description - Basis of Design: DuPont StraightFlash VF, Dual-sided butyl.

B. Flex Flash Membrane, VB - 3M

Location - SA Sheet Applied Option. Wrapping of Window and Door Frame Openings
Description - Basis of Design: 3M 3015
- Also Acceptable: Henry, CCW
- 3M Air Barrier, #3015
- Mark Kennedy, CSG, (215) 321-5300
- Typ no primer reqd., Confirm w/ pull test.
- Installation Temp: 0F to 150F.
- Withstands Temp: -40F to 240F.
- UV exposure to 24 months.
- Compatible with most sealant and building materials.
- Heavy duty durable film.
- NFPA 285 Compliant as part of assembly.
- Non-Asphaltic

Notes - Some surfaces may need to be stabilized with compatible spray adhesive primer.
- Coordinate with AWB to Connect and Shingle Lap with Adjacent Flashings & Terminations.

C. Conformable Flex Flash - 3M

Location - SA Sheet Applied Option. Detail complex penetrations and windows. Conforms around corners for multi-directional detailing. Repositional
Description - Basis of Design: 3M Air Barrier, #3015UC
- Mark Kennedy, CSG, (215) 321-5300
- Typ no primer reqd., Confirm w/ pull test.
- Non-permeable, VB.
- Installation Temp: 0F to 150F.
- Withstands Temp: -40F to 240F.
- UV exposure to 12 months.

- Compatible with most sealant and building materials per AMAA 711-13 using test method ASTM C-794.
- Heavy duty durable film.
- NFPA 285 Compliant as part of assembly.
- Non-Asphaltic
- Color: Black with white markings.

Notes
- Some surfaces may need to be stabilized with compatible spray adhesive primer.
- Coordinate with AWB to Connect and Shingle Lap with Adjacent Flashings & Terminations.

D. Flex Flash Thru-Wall Flashing, VB - 3M

Location - SA Sheet Applied Option. Flashing Crossing Masonry Wall Bearing

Description
- Basis of Design: 3M
- Also Acceptable: Henry, CCW.
- 3M Air Barrier, #3015TWF
- Mark Kennedy, CSG, (215) 321-5300
- Typ no primer reqd., Confirm w/ pull test.
- Installation Temp: 0F to 150F.
- Withstands Temp: -40F to 240F.
- UV exposure to 24 months.
- Compatible with most sealant and building materials.
- Heavy duty durable film.
- NFPA 285 Compliant as part of assembly.
- Non-Asphaltic
- Black with white markings.

Notes
- Some surfaces may need to be stabilized with compatible spray adhesive primer.
- Coordinate with AWB to Connect and Shingle Lap with Adjacent Flashings & Terminations.

END OF SECTION

SECTION 076527

FLUID-APPLIED FLASHING

PART 1 FLASHING

A. Flex Flash Fluid, STPE Hybrid, VB – CCW

Location - Fluid-Applied Option. Wrapping of Window and Door Frame Openings

Description - Basis of Design: CCW Barribond Liquid Flashing. STPE, Polyether based material based liquid flashing for sealing sheathing joints and penetrations, flashing jambs and sills. NFPA 285 Compliant.

- Also Acceptable: Henry, 3M.
- Van Burriss, (610) 429-5253
- BarriBond is a high-solids, silane-terminated polyether (STPE) based compound. BarriBond is a single-component, moisture-cured adhesive/sealant which is applied from a sausage caulking gun, then smoothed in place with a trowel or squeegee. BarriBond is offered in a signature blue color for easy identifi cation in warranted CCW Air Barrier Systems. The product is formulated for clean, easy application over horizontal, vertical, and inverted surfaces.

Notes

- Designed for detailing rough openings, penetrations, sheathing joints, countersunk screws, transitions, angle changes, and other critical details encountered in CCW Fluid-Applied Air Barrier Systems.
- Termination mastic over CCW Self-Adhered Sheet
- Apply BarriBond at a uniform wet mil thickness of 40 mils (0.040 inch), continuously monitoring thickness with a CCW Wet Mil Thickness Gauge to assure adequate coverage. BarriBond can be applied in a single coat.
- The raw edge of gypsum sheathing can be treated with CCW-702, 702 LV, or 702 WB to consolidate this substrate and facilitate coverage with BarriBond.
- Compatible with many common building materials including plywood, OSB, fi re-treated wood, pressure-treated wood, concrete, CMU, glass-mat faced gypsum sheathing, aluminum, copper and PVC extrusion/pipe. BarriBond is also compatible with rigid foam insulation products including XPS, EPS, and R2+ Polyiso (foam core and facers).
- BarriBond will not adhere to cured silicone. However, various silicone sealants commonly specifi ed for sealing the window frame to the rough opening are compatible with cured BarriBond. These can be used to seal the window frame directly to cured BarriBond.
- BarriBond can be exposed to UV for a maximum of 6 months or 180 days. BarriBond is not intended as a wear-resistant or traffic-resistant surface.

- BarriBond is not recommended for spanning joints in excess of 1 inch wide or for filling joints/gaps of more than ½" depth.
- Do not apply BarriBond over visibly damp or wet substrates or over wood substrates having moisture content measuring 20% or higher.
- CCW BarriBond should not be installed in below grade conditions.
- At jambs, and heads in rough openings, the BarriBond and CCW-705 FR-A strips may be used interchangeably, and both are acceptable in NFPA 285-compliant exterior wall assemblies.
- Highly Thixotropic Behavior: neat installation, no slumping or dripping, easy to trowel smooth.
- High Solids: 1-coat application, fi lls cracks and gaps up to 1" (25.4 mm) wide, virtually no shrinkage after cure
- Flexible & Elastic: Forms a tough, durable, and seamless coating at critical details
- Rapid Cure: Resists rain within minutes of application. Resistant to standing water after cure
- Install before or after membrane: Gap Fill, Fillet Beads, Sheathing Board Joints, Screw Patches, Inside & Outside Corners, Rough Openings, Pipe/Duct Penetrations, Screw/Hardware Penetrations, Transition to Neighboring WRB, Roof or Waterproofing System
- Compatible with many common construction materials and CCW Air Barriers
- Also, the raw edge of gypsum sheathing can be treated with CCW-702, 702 LV, or 702 WB to consolidate this substrate and facilitate coverage with BarriBond.
- Do not apply BarriBond over visibly damp or wet substrates or over wood substrates having moisture content measuring 20% or higher. CCW BarriBond should not be installed in below grade conditions.
- Low VOC, Low Odor
- No Shrinkage or Staining
- Resistant to Organic Growth

END OF SECTION

SECTION 079200

JOINT SEALANTS

PART 1 JOINT SEALANTS

1.1 General

A. General Sealant

Quality Control, QC
- Pre-construction Lab Pull Test to each surface anticipated to confirm surface preparation and primer.
- In-Field Mock-up for complete system and color and finish.
- In-Field, Mock-up, Adhesion Pull Test all surfaces to surfaces.
- Cross-section profile sample test, Cut, Record, Archive, Patch. One test per day per crew.

Color
- As Selected by Architect from Standard Range.

Notes
- Prepare Surfaces, Clean, Dry, Rustproofed.
- Concrete, Stone, Other Masonry: Clean by grinding, sandblasting, or wire brushing to expose a sound surface free of contamination and laitance.
- Galvanized to be De-Oil Prepared.
- Assume Prime Required on All Surface Until Proven Otherwise.

1.2 Silicone Sealants

A. Silicone Sealant, Ultra-Low Modulus - Dow Corning

Location
- Exterior Sealant Joints.

Description
- Basis of Design: Dow Corning #790
- Also Acceptable: Pecora, Tremco.
- One-part silicone formulation that cures in the presence of atmospheric moisture to produce a durable, fire-resistant, flexible and ultra-low-modulus silicone rubber
- ASTM C 661 Durometer Hardness, Shore A points 15
- ASTM C 794 Peel Strength lb/in (kg/cm) 25 (4.46)
- ASTM C 719 Joint Movement Capabilities Extension/Compression % +100/-50

Color
- As Selected by Architect from Standard Range.

Notes
- Provide Adhesion Test on All Surface Combination.
- Prepare Surfaces, Clean, Dry, Rustproofed.
- Galvanized to be De-Oil Prepared.

- Assume Prime Required on All Surface Until Proven Otherwise.

1.3 Butyl Sealant

A. Butyl Bedding Sealant - Tremco

Location	-	Bedding Sealant at metal overlaps.
Description	-	Basis of Design: Tremco, Butyl Sealant
	-	Rep: Rafael Rivera, Tremco; 856-495-8089
	-	Bedding Sealant Joining with Neoprene or EPDM
Color	-	Color selected by Architect from Standard Color Options
Notes	-	Clean, Prime, Backer, and Sealant
	-	20 Year Weatherseal Warranty
	-	Adhesion Pull Test all surfaces to surfaces.
	-	Provide backing as required at all joints to maintain correct sealant cross-section 'hour-glass' profile.

1.4 1-Part Urethane Sealants

A. 1-Part, Urethane Sealant – BASF

Location	-	Interior joints, Joints not exposed to daylight.
Rep	-	Andy Good, BASF, 302-668-9757
Description	-	Basis of Design: BASF, MasterSeal NP1, Single-Component, Elastomeric, Polyurethane Sealant
	-	Also Acceptable: Pecora, Tremco, 3M.
	-	Moisture-curing, VOC Compliant
	-	Movement per ASTM C719: +35/-35
	-	Hardness per ASTM C661, Durometer Scale "A": 25-30.
	-	Tensile Strength per ASTM D412: 350psi.
	-	% Elongation per ASTM D412:800%
	-	Not OK with green concrete and damp surfaces.
Color	-	Color selected by Architect from Standard Color Options
	-	Paintable
	-	Sealant will yellow with UV Exposure.
Notes	-	Prepare, Clean, Prime, Backer, and Sealant
	-	Joint width 4x Anticipated Movement.
	-	Provide backing as required at all joints to maintain correct sealant cross-section 'hour-glass' profile.
	-	Not OK w/ oil-based caulking, silicone sealants, polysulfides, fillers impregnated w/ oil, asphalt or tar.
	-	Primer on Horizontal applications.
	-	Treated wood to be aged 6 months.

1.5 Spray Foam Sealants

A. Spray Foam Gap Fill & Seal - DOW Window & Door

Location	-	Gap at Frames, except not within 6" of sill line.
	-	Basis of Design: DuPont/DOW GreatStuff Window and Door, Spray Urethane, Minimally expanding, Flexible.
	-	Also Acceptable: Tremco, Hilti, 3M

1.6 Interior Sealants

A. Interior Joint Sealant, By Others

Location	-	Interior finishes sealant closure joints at exterior wall, By Others.
	-	Close the 1/4" gap between the interior GWB and the door and window frames.
	-	This is not to be considered the sealant joint on the interior side of the window frame.
Description	-	Acrylic Silicone pre-tinted.
	-	Backer is not necessary. This is a gap fill not an active movement joint.

END OF SECTION

SECTION 084000

OPENINGS

PART 1 Entrances, Storefronts, and Curtain Walls

A. General

- Delegated Design: Submit Engineered Shop Drawings including Fasteners and Stiffeners to meet design loads.
- Sub-Sills (if any) to extend to face of jambs, have upturned end-dams and be top and face sealed to adjacent jamb flashing.
- Framing types are selected to comply with intended and expected design loads, moisture resistance, air leakage, U-values, and structural loading based on wind loading, mullion spacing, and mullion length (with one mid-brace).

B. QC Quality Control Testing

- QC Testing to occur once windows are installed and sealed at the wet and air barrier lines, walls tohave AWB and RainScreen Brackets installed, and tested prior to the installation of the wall cladding systems. Thin stone systems to be installed.

C. AAMA 501.2

- Perform (4) AAMA 501.2, Hose Stream Tests on Each Type of Window System. Perform with Supervision and Recording of Results. Repair and Remediate and Retest if Test Fails. Test to include 5' x 5' with the surrounding wall to window frame joint. 6.24 psf differential pressure for storefront systems. 8psf differential pressure for curtainwalls.
- Testing performed by on on behalf of Contractor.
- Failed test results in retesting plus one additional test for each failure.
- Architect or Architect's representative to be notified of option to witness testing, identify testing locations, receive testing reports, and consult on issues if failures.

D. AAMA 501.2

- The AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems is designed to aid in the water-tight testing of large glass areas meant to be permanently closed, such as store fronts, curtain walls, and sloped glazing systems.

E. Structural Loading & Basis of Design

Structural Loading	-	First and Second Floor: 20psf
	-	Corners: 30psf
Assumptions	-	4'6 Mullion Spacing as Typical. Actual Design will be Required to Accommodate Each Individual Window Opening Condition.

END OF SECTION

SECTION 084413

GLAZED ALUMINUM CURTAIN WALLS

PART 1 7 1/2" Curtainwall 4x, YKK

Location - Vertical Two-Story Window at New Elevator Lobby

Engineering - Delegated Design: Provide Shop Drawings with Engineered License and Calculations. Include Fasteners.

Description - YKK: YCW750OG, 7 1/2", Thermaly Broken Aluminum Windowwall Framing, with Separate Cap and 4x.

- 7 1/2" Deep, Thermally Broken & Enhanced Thermally Broken sill, Snap Cover.
- 3/4" Mullion Cap at Perimeter.
- Jamb Extensions with custom size to accommodate resulting sizes.
- Continuous Plastic Throat Insert to Allow Perimeter Joint Treatment.
- Three Sealant Lines: Dress Sealant at Face of Cap; Wet Seal Line at Shoulder; Air Barrier Line at Back of Frame;
- At wet-seal line, provide self-adhering flex-flash glazed into window pocket and sealed to flanking walls on all four sides. Overlay CedarBreather drainage mesh across bottom apron drop. Provide backer and urethane sealant at temporary weather seal and as flex-flash joint backup. Cap all edges and overlap edges with accessory sealant.
- Perimeter Frame Gap filled with FG stuffing or Low Expanding Foam Seal.
- Separate Interior Sealant Line between GWB and Framing.
- .06 Air Infiltration Rated @ 6.24.
- 15PSF Moisture Infiltration Rated per ASTM E331.
- .40 Thermal Average U Value.
- 5' Spacing @ 20PSF = 12'-6 Span.
- 4' Spacing @ 20PSF = 13'-6 Span.
- 5' Spacing @ 20PSF w/ 1x Stl = 18'-0 Span.
- 4' Spacing @ 20PSF w/ 1x Stl = 19'-4 Span.

Color - 2-coat Kynar solid color finish. Custom color white to match painted window frames as selected by Architect.

Notes - Provide Steel Reinforcement or Heavy Wall Extrusions for Special Conditions based on Length, Corner, Door Jamb, etc.

- Provide designed anchor and braced tie-back at sill at 1st floor, mid-height at second floor, and head at ceiling of 2nd floor.

Insulative Glass - Vitro, 1/4"Solarban 60 Clear (2) HS + 1/2" Space (Argon), Black Spacer, + 1/4" Clear.

- Basis of Design: JEB3 Warm Edge
- Visible Light Transmittance: 70%
- Visible Light Reflectance Exterior: 11%.
- Winter U: .29 - .05 = Argon U: .24. with Warm Edge = U.20
- Solar Heat Gain Coefficient (SHGC): .39.
- Light to Solar Gain (LSG): 1.79.
- Heat Strengthened Outer Lite
- Tempered as per Code.

Spandrel
- Matching insulative low-e glass, both lites heat strengthened, or tempered as per code, with soft-coat #4 surface soft-coat in color as selected by Architect.
- Provide 3" foil-faced semi-rigid mineral wool held 1" from inward side of spandrel glass. Foil-tape perimeter and all seams.

Closure Panel
- Provide 3/16" ACM bonded aluminum to phenolic panel with route and return as interior closure panel at spandrel units. Color to match window frame color.

END OF SECTION

SECTION 090190

FINISHES

PART 1 MAINTENANCE OF PAINTING AND COATING

1.1 Paint Removal, Chemical - Chemique, StripIt Solvent

Location	-	Only on as-needed basis.
Rep	-	Van Burriss
Description	-	Basis of Design: Chemique, StripIt, Safer Solvent Based Remover.
	-	Biodegradable, OVO compliant, heavy duty, water rinseable remover for interior or exterior use.
	-	Removes urethane, expoxies, lacquers, acrylic curing compounds, emanels, graffiti, floor finish build-up, adhesive, latex paint, acrylic and other sealers.
	-	Do not use on aslphalt, rubber, resilent tile etc.
Mock Up	-	Test to determine compatibility and dwell time before general use.
Preparation	-	Protect surrounding surfaces, plants and vegetration..
Application	-	Apply liberally. Dwell time will be 30minutes to several days. Once lifting the coating, scrape to remove and wash remaining with water. A second application may be necessary or longer dwell time.
Refer	-	Mnfr's specifications & installation instructions, and safety standards including lead precautions.

1.2 Paint Removal, Chemical - Chemique, StripIt Pro, Water-based.

Locaton	-	Only on as-needed basis.
Rep	-	Van Burriss
Description	-	Basis of Design: Chemique, StripIt, Professional, High Perfornamce Paint Remover (PRO)
	-	Water-Based, Biodegradable, OVO compliant, heavy duty, water rinseable remover for interior or exterior use.
	-	Removes urethane, expoxies, lacquers, acrylic curing compounds, emanels, graffiti, floor finish build-up, adhesive, latex paint, acrylic, lead-based paint, elastomeric, automotive finishes.
	-	Can be used on fiberglass, plastic.
		Does not require neutralization and forms its own moisture barrier and typically does not require the use of StripIt Paper.
Mock Up	-	Test to determine compatibility and dwell time before general use.

Preparation - Protect surrounding surfaces, plants and vegetration..

Application - Apply liberally. Dwell time will be 30minutes to several days. Once lifting the coating, scrape to remove and wash remaining with water. A second application may be necessary or longer dwell time.

Refer - Mnfr's specifications & installation instructions, and safety standards including lead precautions.

END OF SECTION

SECTION 092900

GYPSUM BOARD

PART 1 GYPSUM WALL PANELS, MOLD-RESISTANT - USG

Location - Typical Gypsum Wall Panel at Interior Side of Exterior Walls, and walls in Moisture-Prone Rooms, and all Perimeter Groud-Level Walls.

Description
- Basis of Design: USG, 1/2" mold-resistant treated paper-faced Gysum Wall Panels and Coordinating Joint Treatment.
- Also Acceptable: National Gypsum, Georgia Pacific.
- Typical Level 3 Finish, unless noted otherwise.
- Install per mnfr's typical instructions including control joints, joint staggering, fastener type and spacing, wall framing, design deflection, wall bracing, expansion tracks, and 1/2" gap at floors.
- R0.56; 25perm

END OF SECTION

SECTION 099113

EXTERIOR PAINTING

PART 1 PAINTING

A. Exterior Paint on Metal

Description	-	Basis of Design: Sherwin Williams, Pro Industrial™ DTM Acrylic System.
	-	Basis of Design: Sherwin Williams Industrial Finishes (SW)
Prepare	-	For Galvanized: SP1 Solvent Clean + SP2 Hand Tool prepare + Clean as per Mnfr's recommendations based on substrate.
Prepare	-	SP1 Solvent Spot-Clean + SP2 Hand Tool prepare + Clean as per Mnfr's recommendations based on substrate.
Prime	-	SW ProIndustrial Pro-Cryl Primer.
Coating	-	(2) Coats SW Pro Industrial™ DTM Acrylic

B. Exterior Paint on Wood and Composite Wood Trim, Frames.

Location	-	Exterior new and repainted existing wood trim, frames, fascia, soffits.
Description	-	Basis of Design: Sherwin Williams, Emerald Exterior Acrylic Latex System. Satin Finish, Ultra-White Base, Custom Tinted.
Caution	-	Take State and Industry required precautions for lead-based paints remediation and/or encapsulation. Identify locations and label.
	-	Clarify and post precautions, specialized equipment and required proceedures.
Prepare	-	Scrape, Sand to soften edges, Powerwash or scrub, Mildicide, Rinse. Dry. Tack clean.
	-	Clean and touch-sand and Tack between each coat including post-primer.
Prime	-	Oil-based primer appropriate for receiving surface.
Additional Spot-Prime	-	Oil-based primer on knots and bleeding stains.
Coating	-	(2) Coats SW Emerald Acrylic Latex, Satin.

C. Exterior & Interior Paint on Exterior Wood Doors.

Location	-	Hi-Durability Painted Exterior Doors on Interior and Exterior Sides.

Description	-	Basis of Design: Sherwin Williams, Emerald Urethane Trim Enamel Interior-Exterior Waterbased Semi-Gloss Paint, Hi-Hide White Base, Custom Color Tinted.
Caution	-	Take State and Industry required precautions for lead-based paints remediation and/or encapsulation. Identify locations and label.
	-	Clarify and post precautions, specialized equipment and required proceedures.
Prepare	-	Scrape, Sand to soften edges, Powerwash or scrub, Mildicide, Rinse. Dry. Tack clean.
	-	Clean and touch-sand and Tack between each coat including post-primer.
Prime	-	Oil-based primer appropriate for receiving surface.
Additional Spot-Prime	-	Oil-based primer on knots and bleeding stains.
Coating	-	(2) Coats SW Emerald Urethane Trim Enamel, Semi-Gloss.

D. Exterior Solid Color Stain on Shingles New & Existing

Location	-	Solid color staining of new cedar shingle siding. Custom color to match existing.
Description	-	Basis of Design: Sherwin Williams, WoodScapes, Exterior Acrylic, Solid Color Stain
Prime	-	Prime with oil base penetrating primer.
Coating	-	(2) Coats SW WoodScapes, Exterior Acrylic Solid Color Stain. Custom Color to match historic color as identified by Architect.

END OF SECTION

SECTION 142423

CONVEYING EQUIPMENT

PART 1 Hydraulic Passenger Elevators

A. Holeless Cabled-Hydraulic Elevator - Symmetry LU/LA Elevator

Location	-	Primary elevator, First to Second Floor, Front & Back Entries, Two stops each, thus four-stops total.
Description	-	Symmetry Elevator, Model-Elevation, LU/LA Limited Use/Limited Application Elevator. SymmetryElevator.com.
	-	ADA and Code compliant. ASME A17.1 Section 5.2 and ADA (Americans with Disabilities Act).
	-	13"pit. 106" overhead.
	-	Automatic Self-leveling.
	-	1:2 cable hydraulic drive system. Single stage hydraulic jack and two 3/8"aircraft ropes using wedge sockets.
	-	Smooth start and stop.
	-	Front and Rear door.
	-	Two-stop at both front and for rear (four stops total).
	-	36" wide door, horizontally sliding two-speed hoistway and cab door. Full-height electric screen.
	-	Pit depth, Confirm.
	-	Overhead: 8'10" (106") with alternative means (top car clearance device).
	-	Green drive system by adding environmentally biodegradable hydraulic oil.
Features	-	3-phase motor & controller (208/230, 3PH, 15amp.
	-	Phase 1 & Phase 2 Fire Service.
Safety Features	-	Standard components.
	-	Emergeycy lowering with battery backup system.
Platform Size	-	42" W x 60" D
Specifications	-	208/230, 3PH, 15amp, 60HZ.
	-	Capacity: 1400#
	-	Speed: 30FPM
	-	Travel: 25' standard.
	-	Three-year limited parts warranty.
	-	Submit option for additonal 5 year warranty.
	-	Overhead light; Overhead light switch.
	-	Overhead GFI Duplex Receptacle.
	-	Pit Light; Pit Light Switch Installed 48" abv finished floor.
	-	Pit GFI Duplex Recepticle.

Notes
- Hoistway must be free of any obstructions unrelated to the elevator operation (ie pipes, ducts, etc.).
- Brush stainless steel ceiling panels with mini-LED (3000k) downlights.
- Brushed stainless steel tubular handrail at sides.
- Laminate wall panels with wood grain laminate from standard and upgraded options.
- Flooring by Interiors (NIC)
- Hall Lantern
- Hall Lantern; Hall Button w/ integrated regulatory signage
- Key operator on 1st Floor, Elevator defaults to 1st Floor.
- Non-emergency generator. Upon loss of power, elevator lowers to 1st floor and doors open.

END OF SECTION

SECTION 210000

FIRE PROTECTION

PART 1 GENERAL

1. General:

A. All applicable codes, laws and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these specifications, and their provisions shall be carried out by the contractor who shall inform the owner, prior to submitting a proposal, of any work or material which violates any of the above laws and regulations. Any work done by the contractor causing such violation shall be corrected by the contractor.

B. Investigate each space through which equipment must be moved. Where necessary, equipment shall be shipped from manufacturer in sections of size suitable for moving through available restrictive spaces. Ascertain from building owner and tenant at what times of day equipment may be moved through all areas.

C. Drawings are diagrammatic and indicate general arrangement of systems and work. Pipe routing is shown diagrammatically and does not show all offsets, drops and rises of runs. The contractor shall allow in his price for routing of pipe to avoid obstructions. Coordination with the existing services, including those of other trades is required. Maintain headroom and space conditions.

D. Install work so as to be readily accessible for operation, maintenance and repair. Minor deviations from drawings may be made to accomplish this, but changes which involve extra cost shall not be made without approval.

E. Removal and relocation of certain existing work will be necessary for the performance of the general work. All existing conditions cannot be completely detailed on the drawings. The contractor shall survey the site and include all changes in making up the work proposal.

F. Connections to existing work: install new work and connect to existing work with minimum interference to existing facilities. Temporary shutdowns of existing services shall be performed at no additional charges, at times not to interfere with normal operation of existing facilities and only with written consent of owner. Maintain continuous operation of existing facilities as required with necessary temporary connections between new and existing work. Connect new work to existing work in neat and acceptable manner. Restore existing disturbed work to original condition.

G. Disconnect, remove and/or relocate existing material, equipment and other work as noted or required for proper installation of new work.

H. The contractor shall keep all equipment and materials, and all parts of the building, exterior spaces and adjacent streets, sidewalks and pavements, free from material and debris resulting from the execution of this work. Excess materials will not be permitted to accumulate either on the interior or the exterior.

I. The locations of the existing services are believed to be as indicated on the drawings. The contractor shall verify the actual location of these services and notify the engineer of any discrepancies prior to commencing any work.

J. Seal openings through partitions, walls and floors with a u.l.-listed firestopping assembly matched to the rating of the penetrated element.

K. Provide all necessary flashing and counterflashing to maintain the waterproofing integrity of this building as required by the installation or removal of piping and equipment. Provide equipment curbs as required.

L. All present material, equipment and construction debris to be removed under this contract shall become the property of the contractor with the exception of specific equipment and apparatus requested by the building representative, architect or as noted to be relocated on the drawings. Removed equipment shall be properly disposed of by this contractor, or as directed by the owner.

M. Materials and workmanship, unless otherwise noted, shall be in accordance with building standards.

N. The work in the building shall be done when and as directed, and in a manner satisfactory to the owner. The work shall be performed so as to cause the least possible inconvenience and disturbance to the present occupants.

O. The contractor's proposal for all work shall be predicated on the performance of the work during regular working hours. When so directed, however, the contractor shall install work in overtime and the additional cost to be charged therefore shall be only the "premium" portion of the wages paid.

P. Unless otherwise specifically specified, include all cutting and patching of existing floors, walls, partitions and other materials in the existing building. The contractor shall restore these areas to original condition.

Q. All material and equipment to be new unless otherwise noted and shall be in accordance with building standards.

1) All material and equipment on site shall be properly stored such that it is protected from damage and exposure to outside elements.

R. Submission of a proposal shall be construed as evidence that a careful examination of the portions of the existing building, equipment, etc., which affect this work, and the access to such spaces, has been made and that the contractor is familiar with existing conditions and difficulties that will affect the execution of the work. The contractor is responsible to indicate any discrepancies between the contract drawings and actual field conditions prior to submittal of bid. Submission of a proposal will be construed as evidence that such an examination has been made. Later claims shall not be made for labor, equipment or materials required because of difficulties encountered which could have been foreseen during such an examination. The on-site inspection shall verify existing pipe sizes, clearances, etc. And conditions.

S. The final acceptance will be made after the contractor has adjusted his equipment, tested the various systems, demonstrated that it fulfills the requirements of the drawings and specifications and has furnished all the required certificates of inspection and approval.

2. Scope of work:

A. Scope of work shall consist of providing labor, materials, equipment, services and fees necessary for complete and safe installation in conformity with the pennsylvania construction code and all other applicable industry, national and local codes and authorities having jurisdiction, as indicated on drawings and herein specified.

1) Modify and extend existing sprinkler branch piping to serve new heads.

2) Provide complete hydraulically calculated automatic dry pipe sprinkler system in all areas of work including connection floor control valve assembly, test/drain, piping and heads, auxiliary

B. The base building drawings, plans, details, specifications and specification addenda are made part of this contract and shall apply to all work under the contract unless otherwise amended, modified, supplemented or specified herein.

C. The contractor shall furnish a written guarantee to replace or repair promptly and assume responsibility for all expenses incurred for any workmanship and equipment in which defects develop within one year from the date of final certificate for payment and/or from date or actual use of equipment or beneficial occupancy of spaces by owner included under the various parts of the work, whichever date is earlier. This work shall be done as directed by the owner. This guarantee shall also provide that where defects occur, the contractor will assume responsibility for all expenses incurred in repairing and replacing work of other trades affected by defects, repairs or replacements in equipment supplied by the contractor.

D. The contractor shall give necessary notice, file drawings and specifications with the department having jurisdiction. The contractor shall arrange for inspection and tests of any or all parts of the work if so required by authorities and pay all charges for same. The contractor shall pay all costs for, and furnish to the owner before final billing, all certificates necessary as evidence that the work installed conforms with all regulations where they apply to this work. The contractor shall obtain all necessary and required sign-offs and approvals for the work installed.

3. Shop drawings:

A. Prior to the installation of any work and procurement of equipment provide complete set of coordinated shop drawings of all new and existing equipment, indicating capacity dimensions and sequence of operation for written approval by the architect and engineer.

B. Indicate on each shop drawings submitted:

1) Project name and location.

2) Name of architect and engineer.

3) Item identification.

4) Approval stamp of prime contractor.

C. Submissions:

1) Submissions 11 in. X 17 in. Or smaller: if the submission is a catalog cut, then the contractor shall submit one original and two copies. Otherwise, he shall submit three copies. The architect will forward the original and one copy (two copies when no original is received) to the engineer. All catalog cuts shall be complete.

2) Submissions larger than 11 in. X 17 in.: submit two prints and one paper sepia to the architect. The architect will forward one print and the paper sepia to the engineer.

D. Submit shop drawings for the following:

1) Pipe and fittings.

2) Valves.

3) Sprinkler heads and accessories.

4) Piping layouts.

5) Hydraulic calculations.

6) Supports, hangers and guides.

7) Fire extinguishers and cabinets.

8) Pumps and controls.

4. As-built drawings and equipment operational instructions:

A. Upon completion and acceptance of work, contractor shall furnish written instructions and equipment manuals and demonstrate to the owner the proper operation and maintenance of all equipment and apparatus furnished under this contract.

B. These instructions shall be typed on 8-1/2 in. X 11 in. Paper and bound in three ring binders with clear acetate covers. Contractor shall give three copies of the instructions to the owner and one copy to the engineer.

C. The instruction booklet shall bear the name, address and telephone number of the project, architect and engineer.

D. Reproducible "as-built" drawings shall be provided indicating the as installed conditions of the work. "as-built" drawings shall be provided to the architect after completion of the installation.

5. General provisions for fire protection work:

A. Specifications are of simplified form and include incomplete sentences. Words or phrases such as "the contractor shall," "shall be," "furnish," "provide," "a," "the," and "all" have been omitted for brevity.

B. Definitions:

1) "provide": to supply, install and connect up complete and ready for safe and regular operation the particular work referred to unless specifically otherwise noted.

2) "install": to erect, mount and connect complete with related accessories.

3) "furnish" or "supply: to purchase, procure, acquire and deliver complete with related accessories.

4) "work": labor, materials, equipment, apparatus, controls, accessories and other items required for proper and complete installation.

5) "concealed": embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces, or in enclosures.

6) "exposed": not installed underground or "concealed" as defined above.

7) "similar" or "equal": equal in materials, weight, size, design and efficiency of specified product.

C. Quality assurance:

1) Quality and gauge of materials: new, best of their respective kinds, free from defects and if applicable listed by underwriters laboratories, inc., and

factory mutual inc. Or bearing their label. Materials and equipment of similar application shall be of same manufacturer, except as noted.

2) Guarantee: all materials and workmanship shall be guaranteed for a period of one year from date of acceptance of work.

D. Product delivery, storage and handling:

1) Moving of equipment: where necessary, ship in carted sections of size to permit passing through available spaces.

2) Accessibility: for operation, maintenance and repair, minor deviations shall be permitted. Changes of magnitude or involving extra cost are not permissible without review.

E. Brush and clean work prior to concealing, painting and acceptance. Painted exposed work that is soiled or damaged. Clean and repair to match adjoining work before final acceptance. Remove debris from inside and outside of material and equipment.

F. Final locations and mounting orientations of all visible fire protection equipment be verified by architect.

G. All access door locations shall be reviewed by architect prior to installation.

6. Products:

A. Escutcheons:

1) All exposed piping passing through walls, floors, partitions and ceilings shall be provided with chrome plated cast brass escutcheons held in place with set screws.

B. Gauges:

1) Provide potter roemer figure 6240 or 6245 water pressure gauge where indicated on the drawings. Confirm maximum system pressure.

2) Shut-off cocks shall be provided between gauges and piping to permit gauge removal while system is under pressure.

C. Water flow switch:

1) Pressure type: provide potter model ps-2 pressure type flow switch with two sets of s.p.d.t. Contacts.

2) Vane type: provide potter model vsr-f vane type water flow switch with retard and two sets of s.p.d.t. Contacts.

D. Tamper switch:

1) Os&y valves: provide potter model ps-2 pressure type flow switch with two sets of s.p.d.t. Contacts.

7. Valves:

A. Floor control valves:

1) 2 inch and smaller: provide nibco figure t-104 o 175 wwp bronze os&y gate valve with threaded ends.

2) 2-1/2 inch and larger: provide nibco figure f-607 ots 175 wwp iron body os&y gate valve with flanged ends.

3) 2-1/2 and 3 inch: provide victaulic series 727 butterfly valve with grooved ends, including integral supervised open d.p.d.t. Tamper switch.

B. Pressure reducing valves (prv):

1) 2-1/2 inch: provide potter-roemer figure 4036 capped all brass pressure regulating valve with capped bonnet. Internal parts of brass and stainless steel.

2) Downstream of each prv, provide a potter roemer, figure 4059 3/4 inch sprinkler system pressure relief valve set at 175 psi.

C. Drain valves:

1) 2 inch and smaller: provide stockham figure kt211-w-ul (globe)/t-301w (angle) 200 wwp bronze globe valve with threaded ends.

D. Test/drain valves:

1) 1-1/4 inch: provide g/j innovations "sure-test" inspectors test and drain valve.

E. All fire protection valves shall be u.l. Listed.

F. Installation:

1) All valves shall be installed in the upright vertical or horizontal positions unless otherwise noted on the drawings.

2) All valves shall be installed in accessible locations to facilitate easy removal for repair or replacement.

3) The hand wheel of all floor control valves shall not exceed a height of 7'-0" above the finished floor.

8. Pipe and fittings:

A. Pipe:

1) All sprinkler and fire standpipe piping above grade: standard weight black steel pipe, schedule 40, welded or seamless, with manufacturer's name rolled into each length.

2) All sprinkler main piping above grade with maximum working pressure of 175 psi: light weight schedule 10 pipe with manufacturer's name rolled onto each length.

B. Fittings:

1) Threaded: standard malleable iron couplings with flat band.

2) Welded or flanged: standard weight steel.

a. Schedule 80 for schedule 80 piping systems.

3) Rolled or cut groove:

a. "t"s, elbows, nipples, caps and crosses of ductile or malleable iron; victaulic products or approved equals.

b. Branch outlets of hole cut type with 2-piece bolted ductile iron housings: victaulic style 920 and style 920n.

c. All fittings in schedule 80 piping systems shall be vicaulic style 77, or approved equal.

C. Joints:

1) Threaded (schedule 40 only) with approved compound.

2) Cut groove (schedule 40 only) with rigid malleable iron bolted couplings with epdm gaskets, victaulic style 07, or approved equal.

a. For schedule 80 pipe systems, victaulic style 77 or approved equal.

3) Roll groove (schedule 40 or schedule 10) with rigid malleable iron bolted couplings with epdm gaskets, victaulic style 07 or approved equal.

a. For roll groove schedule 10 sprinkler mains with a maximum working pressure of 175 psi, fire service rigid malleable iron bolted couplings with epdm gaskets, victaulic style 005, or approved equal.

D. Applications:

1) Threaded: all sprinkler and fire standpipe systems.

2) Grooved (roll or cut): all sprinkler risers/mains and fire standpipe systems.

E. Acceptable manufacturers: victaulic co., interfit, sprink.

9. Sprinkler heads:

A. All sprinkler heads shall be as scheduled on the plans.

B. Installation:

1) Coordinate sprinkler head locations with the ceiling grid, light fixtures, diffusers, audio equipment and all other components of the reflected ceiling plan.

2) Install sprinkler heads in the center of ceiling tiles and in a true axis line in both directions with a maximum deviation of 1/2 in. Plus or minus from the axis line as established by the architect for use of all trades. At the completion of the installation, remove and reinstall any heads found to exceed the above-mentioned tolerance. Install flush plate sprinkler heads within manufacturer's tolerances. Prior to installation of flush plates, notify architect and consulting engineer for verification of installation. Any heads found out of tolerance shall be removed and reinstalled.

C. All sprinkler heads shall be of the quick-response type.

10. Piping supports:

A. Support all piping from building construction by providing inserts, beam clamps, steel fishplates (in concrete fill only), and acceptable brackets. Submit all methods for review.

B. Provide additional framing where building construction is inadequate. Submit for review.

C. Suspended horizontal piping:

1) Support all piping independently from structure using heavy iron-hinged type hangers, similar to grinnell clevis no. 260.

2) Provide electroplated solid band hangers similar to auto-grip, for two-inch and smaller pipe.

3) Provide wall brackets for wall supported piping, and provide pipe saddles for floor mounted piping.

4) Suspend piping from inserts, using beam clamps with retaining clamp or locknut, steel fish plates, cantilever brackets or other accepted means. Beam clamps shall be similar to grinnell figures 61, 87, 131, or 225.

5) Suspend piping by rods with double nuts.

6) Provide additional steel framing as required and accepted where overhead construction does not permit fastening hanger rods in required locations.

7) Maximum hanger spacing as indicated.

a. Pipe 1 inch and smaller shall be every 8 feet.

b. Pipe 1-1/4 inch and larger shall be every 10 feet.

8) Vertical piping:

a. Provide extension pipe clamps bolted to bare pipe on each side and bearing equally on structure or welded to beam.

b. Provide spacing as indicated.

(1) Threaded and piping grooved piping shall be every other floor level, at a maximum of 25 feet on centers.

D. Expansion anchors:

1) Provide smooth wall, non-self-drilling internal plug expansion type anchors constructed of aisc 12l14 steel and zinc plated in accordance with fed. Spec. 11-a-325 type 1, class 3.

2) Do not exceed 1/4 of average valves for a specific anchor size using 2000 psig (13,800 kpa) concrete only, for maximum working loads.

3) Provide spacing and install anchors in accordance with the manufacturer's recommendations.

4) Expansion anchors shall be ul listed and similar to hilti hdi.

11. Installation:

A. During construction, properly cap all lines and equipment nozzles so as to prevent the entrance of dirt, debris, etc.

B. Each system of piping shall be flushed (for the purpose of moving dirt, debris, etc. From the piping) for as long a time as is required to thoroughly clean the system.

12. Tests:

A. Fire protection system piping shall be hydrostatically at a pressure of 200 psi for a duration of two hours without a loss in pressure.

B. Defects disclosed by the tests shall be repaired or replaced. Tests shall be repeated as directed until all work is proven satisfactory.

C. Take all precautions necessary to prevent damage to the building and its contents as a result of such tests. Repair any damage caused.

D. Arrange and coordinate tests with owner 48 hours in advance. Notify engineer and architect of test date and time.

E. The pre-action sprinkler system shall be tested for compliance with the sequence of operation provided on the drawings.

END OF SECTION

SECTION 220000

PLUMBING

PART 1 GENERAL

1. General:

A. All applicable codes, laws and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these specifications, and their provisions shall be carried out by the contractor who shall inform the owner, prior to submitting a proposal, of any work or material which violates any of the above laws and regulations. Any work done by the contractor causing such violation shall be corrected by the contractor.

B. Drawings are diagrammatic and indicate general arrangement of systems and work. Pipe routing is shown diagrammatically and does not show all offsets, drops and rises of runs. The contractor shall allow in his price for routing of pipe to avoid obstructions. Coordination with the existing services, including those of other trades is required. Maintain headroom and space conditions.

C. Install work so as to be readily accessible for operation, maintenance and repair. Minor deviations from drawings may be made to accomplish this, but changes which involve extra cost shall not be made without approval.

D. The locations of the existing services are believed to be as indicated on the drawings. The contractor shall verify the actual location of these services and notify the engineer of any discrepancies prior to commencing any work.

E. Seal openings through partitions, walls and floors with non-shrinking fire proof caulking or other noncombustible material.

F. Provide all necessary flashing and counterflashing to maintain the waterproofing integrity of this building as required by the installation or removal of piping and equipment. Provide equipment curbs as required.

G. All present material, equipment and construction debris to be removed under this contract shall become the property of the contractor with the exception of specific

equipment and apparatus requested by the building representative, architect or as noted to be relocated on the drawings.

H. Materials and workmanship, unless otherwise noted, shall be in accordance with building standards.

I. The work in the building shall be done when and as directed, and in a manner satisfactory to the owner. The work shall be performed so as to cause the least possible inconvenience and disturbance to the present occupants.

J. The contractor's proposal for all work shall be predicated on the performance of the work during regular working hours. When so directed, however, the contractor shall install work in overtime and the additional cost to be charged therefore shall be only the "premium" portion of the wages paid.

K. All material and equipment to be new unless otherwise noted and shall be in accordance with building standards.

L. Submission of a proposal shall be construed as evidence that a careful examination of the portions of the existing building, equipment, etc., which affect this work, and the access to such spaces, has been made and that the contractor is familiar with existing conditions and difficulties that will affect the execution of the work. The contractor is responsible to indicate any discrepancies between the contract drawings and actual field conditions prior to submittal of bid. Submission of a proposal will be construed as evidence that such an examination has been made. Later claims shall not be made for labor, equipment or materials required because of difficulties encountered which could have been foreseen during such an examination. The on-site inspection shall verify existing pipe sizes, clearances, etc. And conditions.

M. The final acceptance will be made after the contractor has adjusted his equipment, tested the various systems, demonstrated that it fulfills the requirements of the drawings and specifications and has furnished all the required certificates of inspection and approval.

2. Scope of work:

A. Scope of work shall consist of providing labor, materials, equipment, services and fees necessary for complete and safe installation in conformity with the Pennsylvania building code, Pennsylvania department of environmental protection agency, all applicable utility company and authorities having jurisdiction, as indicated on drawings and herein specified.

B. The base building drawings, plans, details, specifications and specification addenda are made part of this contract and shall apply to all work under the contract unless otherwise amended, modified, supplemented or specified herein.

C. The contractor shall furnish a written guarantee to replace or repair promptly and assume responsibility for all expenses incurred for any workmanship and equipment in which defects develop within one year from the date of final certificate for payment and/or from date or actual use of equipment or occupancy of spaces by owner included under the various parts of the work, whichever date is earlier. This work shall be done as directed by the owner. This guarantee shall also provide that where defects occur, the contractor will assume responsibility for all expenses incurred in repairing and replacing work of other trades affected by defects, repairs or replacements in equipment supplied by the contractor.

D. The contractor shall give necessary notice, file drawings and specifications with the department having jurisdiction. The contractor shall arrange for inspection and tests of any or all parts of the work if so required by authorities and pay all charges for same. The contractor shall pay all costs for, and furnish to the owner before final billing, all certificates necessary as evidence that the work installed conforms with all regulations where they apply to this work.

3. Submittals

A. The contractor shall prepare full coordinated composite drawings for the mechanical, electrical and fire protection trades. The contractor shall overlay each trade's work (in separate colors) on a reproducible set of sheetmetal drawings. All conflicts and potential conflicts shall be clearly identified on the sheetmetal drawings. This shall include but not be limited to conflicts with lights, equipment, piping, ductwork and supports of other trades, as well as conflicts with architectural and structural walls, columns, ceilings and structural beams.

B. Indicate on each shop drawing submitted:

1) Project name and location

2) Name of architect and engineer

3) Item identification

4) Approval stamp of prime contractor.

C. Record drawings

1) The contractor shall maintain on a daily basis at the project site a complete set of "record drawings", reflecting an accurate dimensional record of all work. The "record drawings" shall also consist of a set of prints of the final "signed off" contractor's "coordination drawings" prepared by the subcontractors. In addition, the "record drawings shall be marked to show the precise location of concealed work and equipment, including concealed or embedded piping and valves and all changes and deviations in the mechanical work from that shown on the contract documents. This requirement shall not be construed as authorization for the contractor to make changes in the layout or work without written definite instructions from the architect or engineer. The daily "record drawings" shall consist of a set of prints of the contract drawings for this division with the engineer's seal and engineer's firm name removed or blacked out. Prior to commencing work, the contractor shall purchase from the architect or engineer a set of prints to be used for the daily "record drawings".

2) Record dimensions shall clearly and accurately delineate the work as installed; locations shall be suitably identified by at least two dimensions to permanent structures.

3) Prior to final acceptance of the work of this division, the contractor shall submit properly certified "record drawings" to the architect and engineer for review and shall make changes, corrections, or additions as the architect may require to the "record drawings". After the architect and engineer review, the "record drawings" shall be delivered to the owner.

4) Deliverables by the contractor to the owner shall include one set of vellums, three sets of black line copies, one copy of the field drawings, and one set of cd's complete with all drawings files (*.dwg) in auto cad 2000 format

D. Submit shop drawings for the following:

1) Pipe and fittings

2) Valves

3) Plumbing fixtures and trim

4) Piping layouts

5) Supports, hangers and guides

6) Insulation

7) Water heaters

4. General provisions for plumbing work:

A. Specifications are of simplified form and include incomplete sentences. Words or phrases such as "the contractor shall," "shall be," "furnish," "provide," "a," "the," and "all" have been omitted for brevity.

B. Definitions:

1) "provide": to supply, install and connect up complete and ready for safe and regular operation the particular work referred to unless specifically otherwise noted.

2) "install": to erect, mount and connect complete with related accessories.

3) "furnish" or "supply: to purchase, procure, acquire and deliver complete with related accessories.

4) "work": labor, materials, equipment, apparatus, controls, accessories and other items required for proper and complete installation.

5) "wiring": raceway, fittings, wire, boxes and related items.

6) "concealed": embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces, or in enclosures.

7) "exposed": not installed underground or "concealed" as defined above.

8) "similar" or "equal": equal in materials, weight, size, design and efficiency of specified product.

C. Quality assurance

1) Quality and gauge of materials: new, best of their respective kinds, free from defects and listed by underwriters laboratories, inc., or bearing their

label. Materials and equipment of similar application shall be of same manufacturer, except as noted.

2) Guarantee: all materials and workmanship shall be guaranteed for a period of one year from date of acceptance of work.

D. Product delivery, storage and handling

1) Moving of equipment: where necessary, ship in carted sections of size to permit passing through available spaces.

2) Accessibility: for operation, maintenance and repair. Minor deviations shall be permitted. Changes of magnitude or involving extra cost are not permissible without review. Group concealed electrical equipment requiring access with equipment freely accessible through access doors.

E. Paint shall be the best grade for its purpose. Deliver in original sealed containers and apply in accordance with manufacturer's instructions. Colors shall be as selected. Utilize galvanized iron primer on panel and pull boxes, after fabrication. Utilize hot dipped galvanized or dipped in zinc chromate for: outlet boxes, junction boxes, conduit hangers, rods, inserts and supports. Red lead or zinc chromate with finish to match surroundings shall be used for marred surfaces of steel equipment and raceways. A field-applied zinc chromate prime coat shall be utilized for steel or iron work.

F. Brush and clean work prior to concealing, painting and acceptance. Painted exposed work soiled or damaged. Clean and repair to match adjoining work before final acceptance. Remove debris from inside and outside of material and equipment.

G. Final locations and mounting orientations of all plumbing fixtures shall be verified by architect.

H. All access door locations shall be reviewed by architect prior to installation.

5. Pipe and fittings:

A. Sanitary drainage and vent

1) Below grade: service weight hub and spigot cast iron soil pipe and fittings with gasketed hubless fittings.

2) Above grade: hubless cast iron soil pipe and fittings with four band wide heavy duty gasketed hubless couplings similar to husky 4000.

3) On ejector discharge piping: galvanized schedule 40 steel pipe with galvanized threaded malleable iron fittings or grooved piping with victualic couplings.

B. Domestic water

1) Type l hard copper tubing with cast bronze or wrought copper fittings and 95/5 tin antimony solder joints.

2) Standard weight red brass pipe with standard weight cast bronze threaded fittings.

C. All exposed pipe and fittings shall be chrome plated brass.

D. All exposed piping passing through walls, floors, ceilings, and partitions shall be provided with chrome plated cast brass escutcheons held in place with set screws.

6. Valves:

A. Gate valves:

1) Bronze rising stem, 200 psi wog; similar to stockham #b-105, b-109.

B. Ball valves:

1) Two piece, bronze, end entry, 600 psi wwp; similar to stockham #s-216 br-r-t, #s-216 br-r-s.

C. Check valves:

1) Bronze, threaded cap, teflon disc; similar to stockham #b310t, b-320t.

2) Install silent check valves on sewage ejector and sump discharge.

D. Thermostatic tempering valve

1) Piston or discs controlling both hot- and cold-water flow, capable of limited antiscald protection. Include threaded inlets and outlet. Finish: rough bronze and chrome plated when exposed. Similar to holby.

E. Shock absorbers (water hammer arresters)

1) Provide shock absorbers at all plumbing fixtures and equipment shock absorbers shall be jay r. Smith series 5000. Size of shock absorbers and installation procedure shall be as recommended in plumbing and drainage institute standard pdi-wh-201. All water hammer arrestors shall conform to asse 1010.

2) Acceptable manufacturers: j. R. Smith co., zurn industries, josam mfg. Co., sioux chief.

F. Hose bibb

1) Bronze body with replaceable seat disc complying with asme a112.18.1m for compression-type faucets. Include nps 1/2 or nps 3/4 threaded or solder-joint inlet, of design suitable for pressure of at least 125 psig; integral nonremovable, drainable hose-connection vacuum breaker; and garden-hose threads complying with asme b1.20.7 on outlet.

G. Wall hydrant:

1) Nonfreeze concealed-outlet wall hydrants: asse 1019, self-drainable with flush-mounting box with cover, integral nonremovable hose-connection vacuum breaker, casing and operating rod to match wall thickness, concealed outlet, and wall clamp; mifab hy-2000 series.

H. Backflow preventor:

1) Provide watts series 909-reduced pressure zone-back flow preventer.

2) Install where indicated and on all connection to mechanical equipment.

7. Thermometer

A. Provide thermometers where indicated on the drawings and in accordance with the schedule given below. Thermometers shall be 6 in. Dial type, mercury actuated, with adjustable angle face, immersion bulb, and separate socket, cast aluminum case, white background, black markings face, h. O. Trerice series m80700 series. Install in oversize pipe tee and nipple.

B. Locate at and outlet of hot water heater.s.

C. Acceptable manufacturers: h. O. Trerice co., weksler instruments corp., taylor-sybron corp.

8. Flashing fittings;

A. All pipes passing through roofs shall be provided with a flashing fitting set at a suitable level above the roof to terminate the flashing being provided by another trade. All piping passing through roofs shall be so arranged to be a minimum of 12 in. From walls or other obstructions so as to permit proper flashing.

B. Acceptable manufacturers: j. R. Smith mfg. Co., zurn industries, josam mfg. Co.

9. Insulation:

A. All insulation (including jacket, facing and adhesive) shall have composite fire and smoke hazard ratings as tested by procedures listed in astm e-84, nfpa 255 and ul 273; not exceeding a flame spread of 25 and a smoke developed of 50.

B. Fiberglass density: all fiberglass pipe insulation in equipment rooms and/or where exposed to be of the sectional type having 6 lbs/cu ft density. All other fiberglass insulation to be of the 1-piece type having 4 lb density.

C. On valves and fittings provide pre-molded fiberglass fittings. Vapor seal insulation on "cw".

D. Factory applied white fire retardant jacket with self-sealing lap (asj) and butt strip. Ends of pipe insulation sealed off at valves, fittings and flanges with i.c. 301 or fb 30-35). Do not use staples.

E. "hw" piping: provide 1 in. Thick fiberglass sectional pipe covering.

F. Piping exposed to outdoors and pipes subject to freezing: cover any piping subject to freezing with an additional layer of 2 in. Glass fiber insulation of the same finish as specified for the particular service when not subject to freezing, but not less than 3 in. Total thickness.

G. Piping exposed to outdoors: cover piping which is exposed to weather or called for to be weatherproof, in addition to insulation and finishes specified for piping exposed to outdoors, with a polished aluminum jacket similar to johns-manville "metal-lok" or approved equal, including all fittings.

H. Insulation: owens-corning fiberglass; johns-manville; armstrong; certain-teed; pittsburg plate glass.

10. Plumbing fixtures:

A. Provide all fixtures with stop valves and supplies and fixture traps as required.

B. All fixtures shall be as indicated on the architectural documents.

11. Piping supports:

A. Support all piping from building construction by providing inserts, beam clamps, steel fishplates (in concrete fill only), and acceptable brackets. Submit all methods for review.

B. Provide trapeze hangers of bolted angles or channels for grouped lines and services.

C. Provide additional framing where building construction is inadequate. Submit for review.

D. Suspended horizontal piping:

1) Support all piping independently from structure using heavy iron-hinged type hangers, similar to grinnell clevis no. 260.

2) Provide electroplated solid-band hangers similar to auto-grip, for two-inch and smaller pipe.

3) Provide wall brackets for wall-supported piping, and provide pipe saddles for floor-mounted piping.

4) Provide supports with copper lining for uninsulated copper piping.

5) Suspend piping from inserts, using beam clamps with retaining clamp or locknut, steel fish plates, cantilever brackets or other accepted means. Beam clamps shall be similar to grinnell figures 61, 87, 131, or 225.

6) Suspend piping by rods with double nuts.

7) Provide additional steel framing as required and accepted where overhead construction does not permit fastening hanger rods in required locations.

8) Support branch fixture water piping in chases with copper-plated metal brackets, secured to studs, similar to holdrite nos. 102-18, 107-18, 102-26, or 101-26.

E. Provide 180 degree arc galvanized metal covering shields on hangers for insulated piping without incompressible insulating block in insulation at hangers.

F. Maximum hanger spacing as indicated.

1) Pipe 1 inch and smaller shall be every 8 feet.

2) Pipe 1-1/4 inch and larger shall be every 10 feet.

3) Copper tubing 1-1/4 inch and smaller shall be every 6 feet.

4) Copper tubing 1-1/2 inch and larger shall be every 10 feet.

5) Cast iron: every 5 feet and at every fitting or joint.

G. Vertical piping:

1) Provide extension pipe clamps bolted to bare pipe on each side and bearing equally on structure or welded to beam.

2) Provide spacing as indicated:

a. Threaded piping shall be every other floor level, at a maximum of 25 feet on centers.

b. Cast iron piping shall be every floor level, maximum 20 feet on centers; hubless pipe is the exception, requiring a maximum of 10 feet on centers.

c. Tubing shall be every floor level maximum 10 feet on centers.

H. Expansion anchors:

1) Provide smooth wall, non-self-drilling internal plug expansion type anchors constructed of aisc 12l14 steel and zinc plated in accordance with fed. Spec. Qq-a-325 type 1, class 3.

2) Do not exceed 1/4 of average valves for a specific anchor size using 2000 psig (13,800 kpa) concrete only, for maximum working loads.

3) Provide spacing and install anchors in accordance with the manufacturer's recommendations.

4) Expansion anchors shall be u.l. Listed and similar to hilti hdi.

12. Installations:

A. Provide drip leg at base of each vertical change of direction on gas piping

B. Gas valves shall not be located above hung ceilings.

C. All gas valves shall be installed inaccessible locations to facilitate easy removal for repair or replacement.

D. All water piping shall be arranged to drain to low points and to provide for air elimination at high points.

E. A riser control valve shall be provided on each water riser. Provide a drain valve on each riser located upstream of riser control valve.

F. All valves, check valves, pressure reducing valves, shock absorbers, tempering valves, etc., shall be easily accessible for maintenance and/or removal.

G. All drainage piping, unless otherwise indicated, shall be pitched at a minimum rate of 1/8 in. Per ft in direction of flow. Branch connections to stacks or main drains shall not be made in a manner which will permit back-flow.

H. Cleanout on drainage piping shall be installed every 50 feet.

13. Tests:

A. Domestic water piping:

1) Test piping hydrostatically at a pressure of 125 psi.

2) Duration of test shall be 2 hours without a loss in pressure.

B. Drainage and vent piping:

1) Cap all outlets and fill piping system to overflowing from a point at least 10 feet above the floor.

2) The water level shall remain constant throughout the test duration of 2 hours.

C. Arrange and coordinate tests with owner 48 hours in advance. Notify engineer and architect of test date and time.

D. Defects disclosed by the tests shall be repaired or replaced. Tests shall be repeated as directed until all work is proven satisfactory.

E. Take all precautions necessary to prevent damage to the building and its contents as a result of such tests. Repair any damage caused.

END OF SECTION

SECTION 230000

MECHANICAL

PART 1 GENERAL

1. General

A. All applicable codes, laws and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these specifications, and their provisions shall be carried out by the contractor who shall inform the owner, prior to submitting a proposal, of any work or materials which violate any of the above laws and regulations. Any work done by the contractor causing such violation shall be corrected by the contractor.

B. Investigate each space through with equipment must be moved. Where necessary, equipment shall be shipped from manufacturer in sections of size suitable for moving through available restrictive spaces. Ascertain from building owner at what times of day equipment may be moved through all areas.

C. Ductwork and piping is shown diagrammatically and does not show all offsets, drops and rises of runs. The contractor shall allow in his price for routing of ductwork and piping to avoid obstructions. Exact locations are subject to approval of architect. Coordination with the existing services, including those of other trades is required.

D. Support all ductwork and piping from building structure and/or framing in an approved manner. Where overhead construction does not permit fastening or supports for equipment, furnish additional framing. Inserts shall be steel, slotted type and factory painted. Single rod shall be similar to grinnell fig. 281. Multi-rod shall be similar to fee & mason series 9000 with end caps and closure strips. Maximum loading including pipes, ductwork contents and covering shall not exceed 75% of rated insert capability. When supporting from building use beam clamps in approved manner.

E. Install work so as to be readily accessible for operation, maintenance and repair. Minor deviations from drawings may be made to accomplish this, but changes which involve extra cost shall not be made without approval.

F. Removal and relocation of certain existing work will be necessary for the performance of the general work. All existing conditions cannot be completely detailed on the drawings. The contractor shall survey the site and include all changes in making up the work proposal.

G. Plan installation of new work and connections to existing work to insure minimum interference with regular operation of existing facilities. All system shutdowns affecting other areas shall be coordinated with building owner. Install isolation valves at point of connection to the existing piping. Provide temporary duct caps and/or connections to minimize shutdown time.

H. Connect new work to existing work in neat and approved manner. Restore existing work disturbed while installing new work to acceptable condition as determined by architect.

I. Disconnect, remove and/or relocate existing material, equipment and other work as noted or required for proper installation of new system.

J. The contractor shall keep all equipment and materials, and all parts of the building, exterior spaces and adjacent streets, sidewalks and pavements, free from material and debris resulting from the execution of this work. Excess materials will not be permitted to accumulate either on the interior or the exterior.

K. Seal openings around ducts and piping through partitions, walls and floors (not in shafts) with mineral wool or other noncombustible material.

L. Provide all necessary flashing and counterflashing to maintain the waterproofing integrity of this building as required by the installation or removal of pipes, ducts, louvers, conduit, and equipment. Provide equipment curbs and dunnage steel as required.

M. All present material, equipment and construction debris to be removed under this contract shall become the property of the contractor with the exception of specific equipment and apparatus requested by the building representative, architect or as noted to be relocated on the drawings shall be properly disposed of by this contractor.

N. Materials and workmanship, unless otherwise noted, shall be in accordance with building standards.

O. The work in the building shall be done when and as directed, and in a manner satisfactory to the owner. The work shall be performed so as to cause the least possible inconvenience and disturbance to the present occupants.

P. The contractor's proposal for all work shall be predicated on the performance of the work during regular working hours. When so directed, however, the contractor shall install work in overtime and the additional cost to be charged therefore shall be only the "premium" portion of the wages paid.

Q. Unless otherwise specifically specified, include all cutting and patching of existing floors, walls, partitions and other materials in the existing building. The contractor shall restore these areas to original condition.

R. Removable access tile and/or access door are required in hung ceilings, shafts and walls for all volume and fire dampers, automatic dampers and all other mechanical equipment and devices. Hvac contractor to furnish access location requirements to general contractor. Access tile identification: provide buttons, tabs, and markers to identify location of concealed valves, dampers and equipment.

S. All equipment shall have an ul number where applicable. This information must be included in the submittal package.

T. All material and equipment to be new unless otherwise noted and shall be in accordance with building standards.

U. Submission of a proposal shall be construed as evidence that a careful examination of the portions of the existing building, equipment, etc., which affect this work, and the access to such spaces, has been made and that the contractor is familiar with existing conditions and difficulties that will affect the execution of the work. Later claims shall not be made for labor, equipment or materials required because of difficulties encountered which could have been foreseen during such an examination. The on-site inspection shall verify existing ductwork, piping (sizes, clearances, etc) and conditions.

V. The final acceptance will be made after the contractor has adjusted his equipment, balanced the various systems, demonstrated that it fulfills the requirements of the drawings and specifications and has furnished all the required certificates of inspection and approval.

W. Specifications are of simplified form and include incomplete sentences. Words or phrases such as "the contractor shall," "shall be," "furnish," "provide," "a," "the," and "all" have been omitted for brevity.

X. Definitions:

1) "provide": to supply, install and connect up complete and ready for safe and regular operation the particular work referred to unless specifically otherwise noted.

2) "install": to erect, mount and connect complete with related accessories.

3) "furnish" or "supply": to purchase, procure, acquire and deliver complete with related accessories.

4) "work": labor, materials, equipment, apparatus, controls, accessories and other items required for proper and complete installation.

5) "concealed": embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces, or in enclosures.

6) "exposed": not installed underground or "concealed" as defined above.

7) "similar" or "equal": equal in materials, weight, size, design and efficiency of specified product.

2. Scope of work

A. The work under contract includes all labor, materials and appliances necessary for the furnishing, installing and testing, complete and ready for safe operation of the systems. Work shall be installed in a neat, workmanlike manner.

B. The contractor shall give necessary notice, file drawings and specifications with the department having jurisdiction. The contractor shall arrange for inspection and tests of any or all parts of the work if so required by authorities and pay all charges for same. The contractor shall pay all costs for, and furnish to the owner before final billing, all certificates necessary as evidence that the work installed conforms with all regulations where they apply to this work.

C. The contractor shall furnish a written guarantee to replace or repair promptly and assume responsibility for all expenses incurred for any workmanship and

equipment in which defects develop within one year from the date of final certificate for payment and/or from date or actual use of equipment or occupancy of spaces, by owner, included under the various parts of the work, whichever date is earlier. This work shall be done as directed by the owner. This guarantee shall also provide that where defects occur, the contractor will assume responsibility for all expenses incurred in repairing and replacing work of other trades affected by defects, repairs or replacements in equipment supplied by the contractor.

D. Controlled inspection by a licensed professional engineer to be hired by this contractor.

E. Prior to the installation of any work and procurement of equipment provide complete set of coordinated shop drawings of all new and existing equipment, ductwork, piping and control systems indicating capacity dimensions and sequence of operation for written approval by the architect and engineer.

3. Shop drawings

A. Indicate on each submission: project name and location, architect and engineer, item identification and approval stamp of prime contractor.

B. Submissions:

1) All submissions shall be provided in one pdf version and emailed to the architect/engineer in files not larger than 8 mb.

2) Provide additional hard copy submissions as follows:

a. Submissions 11 in. X 17 in. Or smaller: if the submission is a catalog cut, then the contractor shall submit one original and two copies. Otherwise, he shall submit three copies. The architect will forward the original and one copy (two copies when no original is received) to the engineer. All catalog cuts shall be complete.

b. Submissions larger than 11 in. X 17 in.: submit three prints to the architect. The architect will forward one print to the engineer.

C. Submit shop drawings for the following:

1) Ductwork layout and sheet metal designs.

2) Air outlets.

3) Air balance report.

4) Ac units and fans.

5) Piping layout.

6) Operating sequences.

7) Vibration isolation.

8) Electric damper motors.

9) Automatic control systems and devices.

10) Pumps and chillers.

11) Ducted split type air conditioners

12) Ductless split type air conditioners

13) Fans

14) Electric convectors, unit heaters, cabinet heaters. Wall heaters.

4. As-builts and equipment operation instructions

A. On completion and acceptance of work, this contractor shall furnish written instructions, equipment manuals and demonstrate to the owner the proper operation and maintenance of all equipment and apparatus furnished under this contract.

B. These instructions shall be typed on 8-1/2 in. X 11 in. Paper and bound in three-ring binders with clear acetate covers. The contractor shall give three copies of the instructions to the owner and one copy to the engineer.

C. The instruction booklet shall be organized in sections, with one section per system. The cover of the instruction booklet shall bear the name, address and phone number of the project, architect, engineer, mechanical contractor and subcontractors.

D. Reproducible "as-built" drawings indicating as installed conditions shall be provided to the architect after completion of the installation.

5. Sheet metal work

A. Except as otherwise shown or noted, all ductwork and other sheet metal work shall be galvanized sheet steel and shall be installed in accordance with the latest edition of sheet metal and air conditioning contractors national association, inc. Duct construction standards, pressure classification 2 in. W.g.

B. Volume dampers: galvanized steel, per smacna "low velocity manual," except provide bearing at one end of damper rod and quadrant, with lever and lockscrew at other end. For insulated ducts, quadrants mounted on collar to clear insulation. Install with levers accessible.

C. Access doors: insulated or uninsulated, same as duct.

1) Provide minimum 20 in. X 14 in. On main ducts, and 12 in. X 6 in. On branch ducts, unless otherwise approved, at fire dampers, and at all duct accessories such as humidifiers, duct smoke detectors, auto dampers, and louvers.

2) All access doors to be hinged, with latch similar to ventlock no. 100.

D. Flexible connections: neoprene-coated glass fabric, 30 oz per sq yd with sewed and cemented seams, similar to vent fabrics. Provide with metal collars. Allow minimum movement of 1 in.

E. Turning vanes: galvanized steel small double-thickness vanes with 2 in. Inside radius.

F. Fire dampers: ul listed, galvanized steel construction, multibladed type, spring loaded, equipped with fusible link, conforming to nfpa standard 90a and approved by new york city board of standards and appeals for nyc cal-100-65-5m. Similar to air balance model 319-p, rated as required. See installation on drawing.

G. All duct dimensions indicated on plans are inside clear dimensions.

H. Automatic dampers: complete with linkage and electric operator. Opposed blade damper or galvanized steel min. 4 in., max. 8 in. Wide with compressible edge seals to prevent leakage. Factory-assemble steel linkage and shaft with nylon or oil-impregnated bronze bearings. Motor with sufficient power to limit leakage to

10 cfm per sq ft. Linkage to withstand load equal to twice maximum operating force without deflection. Damper mounted in welded steel channel frame.

I. Aluminum ductwork: all outside air, exhaust, and relief ductwork within 5 ft of louvers shall be aluminum with seams sealed watertight with alcoa aluminastic type c seam sealer or solder. Pitch ductwork towards louver.

J. Wire mesh screen (wms): no. 16 ussg, 3/4 square mesh, in 1 in. Wide galvanized steel enclosing frame. Flanged duct opening to receive frame.

K. Low pressure flexible duct: shall be a factory fabricated high temperature copolymer impregnated glass fabric, locked to cold rolled flat steel spiral. Similar to wiremold 57. Maximum installed length shall not exceed 18 in.

L. Combination fire and smoke dampers: ul listed, galvanized steel construction multi-bladed type. Equipped with fusible link conforming to nfpa standard 90a. Similar to ruskin model fsd 60.

6. Noise control

A. If no sound attenuators are required by contract drawings, then provide sound lining also where noted on drawing.

B. Soundlining in ductwork: fibrous glass, minimum 3 lb density, 2 in. Thickness, maximum 0.25 k factor at 75 deg f mean temperature with acrylic coated finish factory applied edge coating and stenciled in accordance with nfpa 90. Flamespread shall be a maximum of 25. Lining shall not support microbial growth and shall be tested in accordance with astm c 1071 and astm g21/g22. Similar to ductmate polyarmor.

C. All soundlining, adhesives, faces and accessories to be applied in accordance with manufacturer's recommendations, except as otherwise noted.

7. Testing and balancing

A. Air balancing shall be accomplished by adjustment of fans and branch dampers for major adjustments. Adjustment of terminal dampers and devices shall be for trim or minor adjustment only. This shall be done to permit the least noise generation in the terminal areas and utilize minimum fan energy.

B. Water balancing shall be accomplished by adjustment of balancing valves at pumps for proper flow. Adjust flow through boilers, chillers, heat exchangers and coils as required.

C. Upon completion of the installation, the contractor shall rebalance any existing portions of air distribution system and water distribution system affected by the renovation and also balance all new work.

D. The contractor shall provide all labor, pressure gauges, flow meters, sheaves, and belts required to balance systems.

E. Balancing report shall be provided on aabc-type forms.

F. Fans, air handling units, pumps, chillers, heat exchangers and coils shall be balanced to within +5% of their design capacities. All other air and water quantities shall be balanced to within +10% of the design quantities.

G. Balancing and testing shall be performed and supervised by nebb and/or aabc certified firm only. Testing and balancing firm shall be used only owner approved firm.

H. The performance and capacity of all systems and equipment to be demonstrated by the contractor.

8. Insulation - general requirements

A. All insulation materials, including jackets, facing, adhesive, coatings, and accessories are to be fire hazard rated and listed by underwriters laboratories, inc. Using steiner tunnel test method for fire hazard classification of building materials, standard ul 723 (astm e-84), (asa a2.5-1963). Flamespread: maximum 25. Fuel contributed and smoke developed: maximum 50. Flameproofing treatments subject to deterioration from moisture or humidity are not acceptable.

B. Definitions:

1) Exposed: indoor ducts, piping or equipment located in mechanical equipment rooms and in areas which will be visible without removing ceilings or opening access panels.

2) Concealed: indoor ducts, piping or equipment which is not exposed.

3) Outdoor: ducts, piping or equipment which is exposed to the weather.

9. Ductwork insulation

A. Insulate all ductwork in accordance with the duct construction schedule.

B. Outdoor ductwork for air conditioning and heating in addition to insulation to be weather protected with open weave glass cloth, manville duramesh, embedded between two 1/8 inch coats of water based foster products corporation, h. B. Fuller company; 35-00vapor-barrier mastic with astm f 1249, water-vapor permeance 3 perms at 0.0625 inch dry film thickness; suitable for outdoor use on below ambient services. All corners reinforced with galvanized steel angles, transverse cut ends at apparatus and roof curbs shall be flashed to the duct or apparatus collar by means of ample zee strip, 48 ounce copper flashings, extending around the entire perimeter of the transverse end, and brazed to the duct or apparatus.

C. Reinsulate all ductwork and piping which is existing and damaged during construction or shown or required to be relocated. Insulate with same material and thickness.

D. Non-insulated ductwork is permissible when one or more of the following exist.

1) Where soundlining is of minimum thickness specified for insulation.

2) Air conditioning return air ductwork exposed in air conditioned spaces and installed in hung ceilings where space immediately above and below are both air conditioned.

E. Installation:

1) Fiberglass blanket: 2 in. Lap strips at all seams. Secure bottom of all ducts over 24 in. Wide with min. 2 rows of weld pins 12 in. On center. Secure all seams with foil vapor barrier tape and vaporseal adhesive.

2) Fiberglass board: seal joints and breaks in facing with 3 in. Wide tape to match facing and adhere with vapor seal adhesive. Apply 5 in. Wide tape at corners, weld pins on top, sides and bottom.

10. Piping insulation

A. Insulate all piping in accordance with the pipe schedule.

B. Piping, valves and fittings to be insulated:

1) Low temperature piping systems - 40 to 100 deg f including:

a. Chilled water supply and return.

b. Condensate drain piping.

c. Refrigerant suction lines.

C. Finish:

1) Type f-1: fitting cover, molded white pvc jacket, ul class 1, maximum permeance 0.05 similar to manville zestron.

2) Type f-2: white vapor barrier coating with 10x10 or 20x20 mesh white glass, polyester or nylon cloth reinforcing membrane, minimum 31 mil dry film thickness, similar to foster tite-fit, ul label.

3) Type f-4: aluminum jacketing with minimum 0.016 in. Wall thickness and longitudinal joints with lock seams.

4) Type f-6: white finishing and insulating cement applied over hexagonal wire mesh. Cement similar to keene superslick.

D. Outdoor piping:

1) For all piping, fittings and valves located outdoors, increase scheduled insulation thickness by a minimum of 1 in. And provide f-4 finish. Provide vaporseal on all outdoor pipes, valves and fittings subject to condensation.

E. Installation:

1) Before applying insulation all pressure and leak tests shall be completed and approved.

2) All insulation shall be butted firmly together. Provide 2 in. Lamp strips at all seams secured with adhesive. Use vapor barrier tape and vaporseal adhesive where required. Staples not permitted. Refrigerant piping insulation shall have mitered fittings.

3) All insulation and vapor barriers shall be continuous passing through sleeves, hangers, etc., or other openings. Provide saddles or shields for protection.

4) Insulation for strainers or other fittings or accessories requiring servicing or inspection shall have insulation removable and replaceable without damage.

11. Vibration isolation

A. General:

1) Provide isolation for equipment, piping and ductwork.

2) Install in accordance with manufacturer's instructions.

3) Provide leveling devices and approved resilient restraining devices as required to limit equipment and piping motion in excess of 1/4 in.

4) Acceptable manufacturers:

a. Mason industries, inc.

b. Vibration eliminator co.

c. Korfund dynamics corp.

B. Ceiling-hung fans and equipment:

1) Provide spring hanger rod isolators. Steel compression spring and neoprene sound pad within a steel retainer box. Similar to mason type pchs.

2) 1 in. Minimum static deflection. 1/2 in. Minimum reserve deflection. Factory-preloaded to 75% of rated load.

3) Provide supplemental steel as required where equipment or structure cannot support point loads.

C. Floor mounted equipment having internal isolation:

1) Provide 5/16 in.-thick neoprene acoustical base pads of ribbed or waffle construction. Similar to mason type w.

2) 50 psi maximum loading. Provide steel bearing plate to distribute load where required.

D. Floor-mounted equipment requiring external vibration isolation:

1) Provide built-in resilient vertical limit stops. Provide two layers of 1/4 in. Neoprene base pad separated by 1/16 in. Sheet steel. Tapped holes shall be in top plate for bolting to equipment. Isolators shall be capable of supporting equipment at a fixed elevation during isolation.

2) 1 in. Minimum static deflection.

3) Corrosion resistant when exposed to weather.

4) Provide supplemental steel as required where equipment or structure cannot support point loads.

12. Piping - general requirements

A. Complete with: pipe, fittings, valves, strainers, motorized valve operators, strainers, hangers, supports, guide, sleeves, and accessories.

B. All items shall be furnished and installed in accordance with the latest editions of the following codes and standards:

1) American society of mechanical engineers (asme).

2) American society for testing and materials (astm).

3) American national standards institute (ansi).

4) Manufacturers standardization society of the valve and fitting industry (mss).

C. All pressurized piping to be tested hydrostatically to 150 psi or 150% of operating pressure, whichever is greater, but never exceed test pressure ansi b16.1 basis. Test duration to be 2 hours with no pressure change corrected for temperature change. Repair or replace leaks or defects without additional cost.

D. Provide dielectric fittings where dissimilar metals are to be joined.

E. Pipe supports:

1) Provide adequate support for pipe and contents to prevent sagging, vibration, or swaying and allow for expansion and contraction. Provide supplemental steel as required where structure cannot support point loads.

2) Horizontal piping to be supported by forged steel adjustable clevis type hanger. Maximum spacing as follows:

a. Steel 1 in. And smaller: 7 ft.

b. Steel 1-1/4 in. And larger: 10 ft.

c. Copper 3 in. And smaller: 7 ft.

d. Additional supports at changes in direction, runouts, and concentrated loads due to valves, etc.

3) Vertical piping:

a. Base elbow support with bearing plate on structural support.

b. Guides at every second floor (spacing not to exceed 25 ft).

c. Top support hanger or saddle in horizontal connection with provisions for expansion.

d. Intermediate steel riser clamp support bolted and welded to pipe bearing on structural steel or bearing plate at floor.

13. Low temperature water systems, below 100 psig, -20 to 200 deg f operating temperatures.

A. Pipe: steel in accordance with astm a53 or a120, with schedule 40 wall thicknesses to 10 in.

1) Runouts to equipment and coils: copper, type l, hard drawn in accordance with astm b88.

B. Fittings:

1) 2 in. And smaller: 125 lb wsp cast iron threaded fittings shall be in accordance with ansi b16.4., cast iron flanged fittings shall be in accordance with ansi b16.1.

2) 2-1/2 in. And larger welded: butt weld fittings same weight as piping and in accordance with ansi b16.9.

3) Copper: wrought copper, soldered, 95/5ta, ansi b16.22.

C. Valves:

1) Gate valves:

a. 2 in. And smaller: bronze threaded ends, solid wedge, inside screw, traveling stem union bonnet. 150 lb wsp: jenkins fig. 47u.

b. 2-1/2 in. And larger: iron body, bronze mounted, solid wedge os&y rising spindle flanged. 125 lb wsp. Jenkins fig. 651-c.

2) Globe valves:

a. 2 in. And smaller: bronze, regrind-renew, 500 brinell stainless steel plug disc and 425 brinell seat ring, union bonnet. 150 lb wsp jenkins fig. 546p.

b. 2-1/2 in. And larger: regrind-renew, iron body, level bronze disc and seat ring os&y flanged, 125 lb wsp jenkins fig. 613c.

3) Silent check valves, spring loaded, globe type, flanged: to 250 psig check valves shall be iron body, bronze trim. Similar to muessco type 103ap or 107-ap.

4) Lubricated plug valves:

a. Screwed ends up to 2 in., flanged 2-1/2 in. And larger.

b. System less than 100 psig, valve shall be minimum 200 lb wog class cast iron body. Rockwell-nordstrom numbers 114, 115, 185 and 149.

5) Y-type strainers:

a. Provide screwed ends to 2 in. And flanged 2-1/2 in. And large with body as follows: to 100 psig: 125 lb wsp class, cast iron.

b. Screens to be 316 stainless steel.

c. Provide screwed with faced cap, straight thread and gasket, similar to mueller steam specialty muessco no. 11. Provide flanged with bolted cover similar to muellar steam specialty muessco no. 751 or no. 752.

D. Provide 1/2 in. Drain valve with capped hose connection at all low points. Provide 3/4 in. Gate valve to drain systems in equipment rooms.

E. Provide manual air vents line size air chamber with 1/2 in. Globe valve at all high points and where flow direction changes from horizontal to downward.

F. Pitch water piping except as noted:

1) Up to 1 in.: 1 in. In 40 ft.

2) 1-1/2 in. And larger: 1 in. In 100 ft.

14. Condensate drain piping

A. Pipe: astm b88, hard drawn copper tubing type "l".

B. Fittings: soldered joint fittings, 95/5 solder.

C. Pitch, except as noted:

1) 1 in. In 4 ft preferred.

2) 1 in. In 8 ft minimum.

D. Swing check valves: at condensate pump discharge. 300 lb wog, bronze body solder ends, regrind bronze disc to be used with copper tubing. Jenkins fig. 1222.

15. Motors:

A. Motors (under hvac work): in accordance with nema, ieee and ansi c50 standards:

1) Standard efficiency unless otherwise noted.

2) 1.15 service factor.

3) Squirrel cage induction, open dripproof type, 1750 rpm, nema type b insulation class, continuous duty, except as noted.

16. Motor controllers

A. Provided by hvac contractor and installed and wired by electrical contractor.

B. Nema enclosure, weatherproof where mounted outdoors.

C. With overload protection. Coordinate all motor controller types and sizes with motor types and sizes.

D. 1/3 hp and smaller: provide manual starter except use magnetic type where automatically controlled.

1) Manual type: 2-pole toggle switch with overload protection and pilot light.

E. 1/2 hp and larger: provide magnetic starter:

1) Combination unfused disconnect switch and magnetic starter except as noted.

2) Overload protection in each phase leg with reset in enclosure.

3) Hoa selector switch for automatically operated motors. Safety controls common to both controls.

4) Red, green and amber pilot lights.

5) Switches: horse-power-rated, external padlocking type.

6) Holding coils: 10 watt, 120 volt.

7) Contacts: main line and minimum (2) - normally open, (2) - normally closed 10 amp auxiliaries, in addition to contacts required for controls specified.

8) Control transformer: for motors over 120 volts, to step down control voltage to 120 volts; of the required capacity with fuse and ground connection on voltage side.

9) Fuses: similar to bussman.

10) Relays: to supplement auxiliary contacts in controller. Minimum 10 watt coil and two 10 amp contacts.

11) Terminals: suitable for conductors noted and as approved.

F. Acceptable manufacturers:

1) Cutler-hammer.

2) Square d.

3) Allen bradley.

17. Smoke detectors

A. The electrical contractor shall supply duct mounted ionization-type smoke detectors and provide all wiring.

B. This contractor shall install the smoke detector in the duct as shown on the plans. The contractor shall not install a smoke detector in a location where its operating range (typically 32-100 deg f) will be exceeded.

C. The supply fan and all associated equipment shall stop and all dampers shall return to their "normal" positions if products of combustion are detected. Reset for the smoke detector shall be at the fire alarm panel (or fire command station).

D. This contractor shall assist the electrical contractor in testing the duct-mounted smoke detection system.

18. Equipment

A. Air cooled liquid chiller:

1) General: to be factory run-tested to confirm proper operation. Units shipped with a full operating charge of refrigerant and oil. Units are

constructed of 14-gauge welded galvanized steel frame with 14 and 16-gauge galvanized steel panels and access doors.

2) Evaporator: tube-in shell design with seamless internally finned copper tubes. Designed, tested and stamped in accordance with asme code for refrigerant side working pressure of 225 psig. Waterside working pressure of 300 psig. Each shell to have a drain and a vent connection, fittings for temperature control sensors and 3/4 insulation.

3) Condenser: air cooled condenser coils having aluminum fins mechanically bonded to seamless copper tubing. Condensers to be tested to 425 psig air pressure. Direct drive condenser fans to be statically and dynamically balanced. Fan motors to have permanently lubricated ball bearings and thermal overload protection. Provide external damper assembly for low ambient operation. Provide grilles with wire mesh screen for coil protection.

4) Compressors: provide inverter scroll compressors with direct drive suction gas-cooled hermetic motor. Unit to be supplied with centrifugal oil pump, oil level sightglass, oil charging valve and removable crank case heater with well.

5) Refrigerant circuit: each refrigerant circuit includes an expansion valve, a filter drier and a liquid line sight glass with moisture indicator.

6) Unit controls: provide the following optional features.

   a. Remote display (to be located in mechanical room) monitor unit alarms and diagnostics.

   b. Low ambient lock-out: unit locked out based on an adjustable outdoor air ambient temperature set point.

   c. Unit disconnect switch.

   d. Control power transformer.

   e. Hot gas bypass.

   f. Vibration isolators (spring).

   g. Gauges to monitor suction and discharge pressure.

h. Flow switch to turn chiller on and off.

B. Bathroom ceiling exhaust fans:

1) Variable speed control constant volume ceiling bathroom exhaust fan with high/low delay timer(adjustable from 30 seconds - 60 minutes). Totally enclosed permanently lubricated dc motor designed for extremely quiet, energy-efficient operation.

2) Detachable adaptors, firmly secured duct ends, adjustable mounting brackets (up to 26"), fan/motor units with a double-hanger bar system.

3) Fan to be energy star rated with a built-in backdraft damper and fluorescent bulbs.

C. Ductless split type air conditioners

1) Factory assembled, wired and run tested with the unit containing factory wiring, internal piping, control circuit board and fan motor. With self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch.

2) Indoor unit and refrigerant pipes shall be charged with dry air before shipment from the factory.

3) Unit cabinet casing white finish with multi directional drain and refrigerant piping with a installation plate to secure unit to wall.

4) The indoor unit fan assembly with line-flow fan direct driven by a single motor. Fan statically and dynamically balanced and run on a motor with permanently lubricated bearings, manual adjustable vertical guide vane provided with ability to change airflow from side to side. Integral, motorized air sweep flow louver for uniform air distribution. Fan motor in three (3) selectable speeds, high, medium and low.

5) Return air with easily removable catechin air filter and an anti-allergy enzyme filter blue bellows type.

6) The indoor unit coil of nonferrous construction with smooth, pre-coated aluminum fins on copper tubing. Sloped condensate pan and drain with extension hose provided under the coil.

7) The electrical power of the unit, supplied from the outdoor unit to be 115 volts, 1 phase, 60 hertz equipped with mitsubishi electric's micro-processor control system directing indoor and outdoor unit coordinated operation by two polarity sensitive control wires.

8) A wireless remote controller to perform input functions necessary to operate the system. The microprocessor located in the indoor unit controlling the outdoor unit.

D. Ductless split type condensing units

1) The outdoor unit is designed for use with ms series indoor units.

2) The casing fabricated from zinc coated steel, bonderized with an electrostatically applied, thermally bonded, acrylic or polyester powder coating for corrosion protection. The unit base of aluminum-zinc-magnesium alloy coated steel, with welded mounting feet.

3) Direct drive propeller type fan, with inherent protection, mounted and isolated for quiet operation. The fan provided with raised guard to prevent contact with moving parts.

4) The condenser coil protected with an integral metal guard. Refrigerant flow controlled by metering orifice.

5) Mitsubishi electric high performance, hermetic, rolling piston, rotary type compressor mounted using rubber isolating bushings to avoid the transmission of vibration, protected by an automatic over current relay and a thermal overload switch

6) The outdoor unit provided with accumulator and pre-charged refrigerant tubing.

E. Electric convectors:

1) Low profile electric convectors with 16 gauge, corrosion resistant enclosure finished in baked enamel furniture quality steel with reinforced, all welded, construction; architecturally styled pedestal legs individually adjustable.

2) Up to three low density elements installed side-by-side on the same plane to uniformly warm all incoming air. The heating bank consisting of steel sheath heating elements with aluminum fins for strength and corrosion resistance. Elements center-anchored and float freely on each end through nylon bushings for quietness. Extruded aluminum bar grille discharge louvers painted bronze brown to contrast with the neutral grey front finish. 1/4-inch mesh screen beneath the discharge grille to defer insertion of foreign objects.

3) Built-in controls to include single-pole, double-pole, or two-stage thermostats, disconnect switch, transformer relay and power relay. The thermostat shall be capable of controlling multiple units on a pilot duty circuit. Thermostat adjustment shall be with a thinbladed screwdriver through the discharge louvers considered tamper-resistant.

4) A full length automatic reset thermal limit switch to turn off heating elements when overheating to restore operation automatically when overheating is corrected. Heaters designed with a built-in pre-wired raceway to enable multiple unit wiring form one feeder source. One-piece painted steel, back panel completely finished, and suitable for mounting in front of a glass curtain wall.

5) All heaters and electrical accessories shall be labeled by underwriters' laboratories, inc. Accessories shall include end caps and completely enclosed blank sections.

F. Electric cabinet heaters

1) The electric cabinet unit heaters to be ul/cul listed, designed for mounting in any position, including on-end, fully recessed, semi-recessed or surface mounted. All capacities, voltages, physical sizes be as specified in the heater schedule. All three phase heaters shall have a balanced heating load. Control voltage is to be internally generated 24 vac

2) Heavy duty 16 gauge cold-rolled steel cabinet with front covers securely attached to the cabinet with a maximum of two slotted head style spring latches easily removable for access to elements, filters and control panel. Cabinet finished in color selected by architect with baked enamel.

3) Heating elements warranted for five years, non-glowing design consisting of 80/20 nichi resistance wire enclosed in a steel sheath with brazed steel

plate fins. The heating element located directly in front of the blower discharge air for uniform heating.

4) Thermal safety cutouts built into the system to automatically shut off heater in event of overheating due to any cause. The safety cutouts interrupt power to the elements and not depend on relays to interrupt the power. Backup manual reset thermal safety cutout in the control circuit to prevent heater reenergizing until cause of overheating has been cleared.

5) The motor(s) and blower(s) to be direct drive and resiliently mounted on rigid heavy gauge frame for quiet operation and long life. The motor(s) to be two speed 1/8 h.p. With automatic reset overload protection.

6) Forward curved, double inlet, centrifugal type blower with discharge directly on the full length of the elements to provide uniform discharge air temperatures.

7) Permanent washable filter to be located ahead of the motor and blower assembly to assure clean air circulation.

8) Heater provided with electrical interlock to shut down when front cover is opened. Fan control to delay start up of the fan motor(s) until the heating elements have warmed up and maintain motor operation after heating elements have been de-energized.

9) Remote mounted two stage wall thermostat, terminals provided in control panel for direct connection of remote wall mounted thermostats. Silent time delay relays to be provided, rather than contactors.

10) Two fan speeds and high-low heat ranges shall be selectable by means of a single rocker switch located behind the front cover.

11) factory installed/prewired optional equipment to be provided -- manual reset thermal cutout, circuit breakers, switch, 120 volt control supply, dead front fused (non fused disconnect switch & circuit breaker), permanent (washable) filter, recess trim kit, base kit.

G. Electric unit heaters:

1) Electric unit heaters automatic fan forced. Heaters shall be ul listed.

2) The tamper-proof thermostat with enclosed contacts shall be completely concealed behind the front cover.

3) Heater shall include thermal cutout, a double-pole single throw disconnect switch, recessed rough-in back box, 16-gauge cold-rolled steel, welded uniform grille finished in baked enamel.

4) Heater with ceiling mounting bracket for horizontal or vertical flow mounting or any position in between. Provide built-in single pole thermostat adjusts from 45° to 135° f. See size and capacity in schedules.

5) Bottom of control box hinges for easy access to controls and wiring. Heating element, fan delay control, thermal cutout thermostat, motor and fan are all easily reached for service.

6) Fins and elements arranged in a uniform grid. Element finished with aluminized paint for corrosion resistance.

7) Automatic control delays fan action until heating element is warm. When thermostat is satisfied, fan to operate until heating element is cool.

8) High-limit cutout automatically shuts off current in event of overheating and reactivates the heater when temperature returns to normal.

9) Adjustable louvers adjust up and down for even greater control of throw direction. Louvers have stops to prevent complete closing of the discharge area. Heater body also has top center hole with weld nut for mounting the heater and allowing it to rotate 360°.

H. Electric radiant heaters

1) The floor-warming mat type heating element and mat assembly installed over plywood, tile backer board, or concrete slab (according to ansi or tca guidelines), and then embedded in a 3/8"-thick layer of self-leveling or thin-set mortar beneath a finished ceramic, tile, or stone floor. Other floor coverings are approved if the mat is embedded in a minimum 1/4"-thick layer of mortar beneath the finished floor.

2) An emf field monitor, held at 1/2" above operating heating elements and set to milligauss scale, must indicate zero electromagnetic field across the entire heating element and mat assembly.

3) Heating mat tested by manufacturer for continuity, correct resistance, and insulation resistance before leaving the factory. Compliance with this quality criteria to be certified on the label of each mat.

4) All heating mats furnished under this section supplied by single manufacturer. Manufacturer to have at least 20 years experience manufacturing floor-warming systems.

5) Heating mat made with self-regulating wire or a wire not woven into a mat construction is not acceptable for this application.

6) The resistance heating wire for the heating mat to be ul recognized for the u.s. And canada for this application. Insulation rated for continuous duty at 302°f (150°c). The mat can produce up to 12 watts/sq. Ft. (129 watts/sq. Meter). Multiple oxygen-free copper or nichrome conductors helically wound around a central core of kevlar® cord. This assembly encapsulated in inner layer of tefzel fluoropolymer. This tefzel insulation surrounded by tin-coated copper braid to provide a ground path. A pex outer jacket shall be extruded over the copper braid for abrasion
And chemical resistance.

7) The control system to include thermostatic control, or equivalent. This control to incorporate a thermistor-type floor sensor to monitor floor temperatures, an integral ground fault circuit interrupter (gfci) or appliance leakage circuit interrupter (alci), a temperature set-back option to reduce energy consumption, and a digital readout.

8) If an alternate control is used, the power supply circuit shall be protected by a ground fault circuit interrupter (gfci) or appliance leakage circuit interrupter (alci). A programmable floorstat or other control shall be installed according to manufacturer’s recommendations.

9) The heating mat listed by ul for the u.s. And canada.

10) The heating mat installed in one step with the mortar bond coat and tile. This installation technique tested by tca or other independent, reputable agency according to astm c627, a standard test method for evaluating ceramic floor tile installation systems using the robinson-type floor tester. The installation and testing to result in a minimum rating of “moderate commercial” for normal (non-vehicular) residential, commercial and light institutional use.

11) The manufacturer shall be a member of the radiant panel association.

I. In-line circulating pumps:

1) Vertical split, flanged, cast iron bronze fitted, pumps with enclosed centrifugal type bronze impeller rated for 125 psig working pressure.

2) Mechanical seals: coordinate seal construction with water treatment and suitable for 40% ethylene glycol (by weight) solution.

3) Circulators with coupling connected and bolted to oil lubricated sleeve bearing motor, similar to bell & gossett booster pump series 60.

END OF SECTION

SECTION 260000

ELECTRICAL

PART 1 GENERAL

1. General

A. All applicable codes, laws and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these specifications, and their provisions shall be carried out by the contractor who shall inform the owner, prior to submitting a proposal, of any work or material which violates any of the above laws and regulations. Any work done by the contractor causing such violation shall be corrected by the contractor.

B. Investigate each space through which equipment must be moved. Where necessary, equipment shall be shipped from manufacturer in sections of size suitable for moving through available restrictive spaces. Ascertain from building owner and tenant at what times of day equipment may be moved through all areas.

C. Install work so as to be readily accessible for operation, maintenance and repair. Minor deviations from drawings may be made to accomplish this, but changes, which involve extra cost, shall not be made without approval.

D. The contractor shall keep all equipment and materials, and all parts of the building, exterior spaces and adjacent streets, sidewalks and pavements, free from material and debris resulting from the execution of this work. Excess materials will not be permitted to accumulate either on the interior or the exterior.

E. Provide all necessary flashing and counterflashing to maintain the waterproofing integrity of the building as required by the installation or removal of conduit and equipment. Provide equipment curbs as required.

F. The contractor's proposal for all work shall be predicated on the performance of the work during regular working hours. When so directed, however, the contractor shall install work during overtime hours and the additional cost to be charged therefore shall be only the "premium" portion of the wages paid.

G. Unless otherwise specifically noted or specified, include all cutting and patching of existing floors, walls, partitions and other materials in the existing building. The contractor shall restore these areas to original condition.

H. All material and equipment shall be new unless otherwise noted and shall be in accordance with building standards.

I. Submission of a proposal shall be construed as evidence that a careful examination of the portions of the existing building, equipment, etc., which affect this work, and the access to such spaces, has been made and that the contractor is familiar with existing conditions and difficulties that will affect the execution of the work. The contractor is responsible to indicate any discrepancies between the contract drawings and actual field conditions prior to submittal of bid. Submission of a proposal will be construed as evidence that such an examination has been made. Later claims shall not be made for labor; equipment or materials required because of difficulties encountered which could have been foreseen during such an examination. The on-site inspection shall verify existing conduit (sizes, clearances, etc) and conditions.

J. Any and all expenses incurred by these equipment manufacturers' representatives related to this project, shall be borne by the electrical contractor.

K. The final acceptance shall be made after the contractor has adjusted his equipment, tested the various systems, demonstrated that it fulfills the requirements of the drawings and specifications and has furnished all the required certificates of inspection and approval

2. Scope of work

A. Scope of work shall consist of providing labor, materials, equipment, services and fees necessary for complete and safe installation in conformity with the national electrical code (nec) and all other applicable industry, national and local codes and authorities having jurisdiction, as indicated on drawings and herein specified.

B. All drawings, plans, details, specifications and specification addenda are made part of this contract and shall apply to all work under the contract unless otherwise amended, modified, supplemented or specified herein.

C. The contractor shall furnish a written guarantee to replace or repair promptly and assume responsibility for all expenses incurred for any workmanship and equipment in which defects develop within one year from the date of final certificate for payment and/or from date or actual use of equipment or occupancy of spaces by owner included under the various parts of the work, whichever date is earlier. This work shall be done as directed by the owner. This guarantee shall also provide that where defects occur, the contractor will assume responsibility for all expenses incurred in repairing and replacing work of other trades affected by defects, repairs or replacements in equipment supplied by the contractor.

D. The contractor shall arrange for inspection and tests of any or all parts of the work if so required by authorities and pay all charges for same. The contractor shall pay all costs for, and furnish to the owner before final billing, all certificates necessary as evidence that the work installed conforms with all regulations where they apply to this work.

3. Shop drawings

A. Prior to the installation of any work and procurement of equipment, contractor shall provide complete sets of coordinated shop drawings of all new and existing equipment, indicating capacity, dimensions and sequence of operation for written approval by the architect and engineer.

B. Indicate on each shop drawings submitted:

a. Project name and location

b. Name of architect and engineer

c. Item identification

d. Approval stamp of prime contractor

C. Submit shop drawings for the following:

a. Switches

b. Fuses

c. Circuit breakers

d. Panelboards (including dimensions, schedules, and catalog cuts)

e. Transformers

f. Raceways

g. Wire and cable

h. Wall switches

i. Insertion receptacles

j. Momentary contact switches

k. Time switches

l. Transfer switches

m. Surface metal raceway

n. Lighting fixtures

4. As-built drawings and equipment operational instructions

A. Upon completion and acceptance of work, contractor shall furnish written instructions and equipment manuals and demonstrate to the owner the proper operation and maintenance of all equipment and apparatus furnished under this contract.

B. These instructions shall be typed on 8.5"x11" paper and bound in three ring binders with clear acetate covers. Contractor shall give three copies of the instructions to the owner and one copy to the engineer.

C. The instruction booklet shall bear the name, address and telephone number of the project, architect and engineer.

D. Reproducible "as-built" drawings shall be prepared in the form of red line markups.

5. General provisions for electrical work

A. Specifications are of simplified form and include incomplete sentences. Words or phrases such as "the contractor shall," "shall be," "furnish," "provide," "a," "the," and "all" have been omitted for brevity.

B. Definitions

a. "provide": to supply, install and connect up complete and ready for safe and regular operation the particular work referred to unless specifically otherwise noted.

b. "install": to erect, mount and connect complete with related accessories.

c. "furnish" or "supply": to purchase, procure, acquire and deliver complete with related accessories.

d. "work": labor, materials, equipment, apparatus, controls, accessories and other items required for proper and complete installation.

e. "wiring": raceway, fittings, wire, boxes and related items.

f. "concealed": embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces, or in enclosures.

g. "exposed": not installed underground or "concealed" as defined above.

h. "similar" or "equal": equal in materials, weight, size, design and efficiency of specified product.

C. General

a. Panel junction and pull boxes shall be located clear of other trades. Support boxes from building structure, independent of conduit. Provide floor-to-ceiling channels for mounting on drywall and lightweight construction. Outlet boxes for fixtures recessed in hung ceilings shall be accessible through opening created by removal of fixture. Secure to black iron support. Motor terminal boxes: coordinate with motor branch circuit and wiring; add box volume where required.

b. The contractor shall verify locations of all equipment with architectural drawings. In centering outlets and locating boxes and outlets, allow for overhead pipes, ducts, and mechanical equipment, variations in fire proofing and plastering, window and door trim, paneling, hung ceilings, and the like, and correct any inaccuracy resulting from failure to do so without expenses to the owner

c. The contractor shall furnish and install wiring for equipment furnished by others, as shown on drawings. Coordinate with all other trades or details for installation. The term “wiring” as used here-in, includes, but is not limited to, furnishing and installing conduit, wire, junction boxes, disconnects and making connections. Contractor shall check architectural, mechanical, and plumbing drawings and specifications for equipment to be installed by others. Contractor shall be responsible for proper wiring and necessary electrical adjustments to equipment to conform to specified requirements of the equipment.

D. Quality assurance

a. Quality and gauge of materials: new, best of their respective kinds, free from defects and listed by underwriters laboratories, inc., or other nationally approved testing agency and bearing their label. Materials and equipment of similar application shall be of same manufacturer, except as noted.

b. On completion of the work, the entire wiring system shall be entirely free from grounds, short circuits, opens, overloads and improper voltages and thorough test shall be made. Furnish all labor and materials and instruments.

c. Guarantee: all materials and workmanship shall be guaranteed for a period of one year from date of acceptance.

E. Product delivery, storage and handling

a. Moving of equipment: where necessary, ship in carted sections of size to permit passing through available spaces.

F. Materials

a. Nameplates: provide black lamicoid sheet with 3/4" white lettering, fastened with epoxy cement for each disconnect switch, circuit breaker, panel, cabinet, transformer, enclosure, motor controller and the like. Nameplates shall describe the name and number of each component.

b. Cable tags: tag each conductor passing through splice or pullbox with a white linen tag, indicating point of origin and termination of the circuit.

c. Inserts and supports

- Inserts: steel, slotted type, factory painted.

1. Single rod: similar to grinnell fig. 281.
2. Multi-rod: similar to fee and mason series 9000 with end caps and closure strips.
3. Clip form nails flush with inserts.
4. Maximum loading 75% of rating.

- Supports from building construction: inserts, beam clamps, steel fishplates (in concrete fill only), cantilever brackets or other means. Submit for review.

- Grouped lines and services: trapeze hangers of bolted angles or channels.

- Where building construction is inadequate: provide additional framing. Submit for review.

G. Paint shall be the best grade for its purpose. Deliver in original sealed containers and apply in accordance with manufacturer's instructions. Colors shall be as selected by architect or engineer. Utilize galvanized iron primer on panel and pull boxes, after fabrication. Utilize hot dipped galvanized or dipped in zinc chromate for: outlet boxes, junction boxes, conduit hangers, rods, inserts and supports. Red lead or zinc chromate with finish to match surroundings shall be used for marred surfaces of steel equipment and raceways. A field-applied zinc chromate prime coat shall be utilized for steel or ironwork.

H. Brush and clean work prior to concealing, painting and acceptance. Painted exposed work soiled or damaged; clean and repair to match adjoining work before final acceptance. Remove debris from inside and outside of material and equipment.

6. Low-voltage distribution equipment

A. All equipment shall conform to nema, ansi and ieee standards.

B. Disconnect switches shall be fused or non-fused as noted. Voltage shall be as required. Switches shall be heavy duty, except as noted, and horsepower rated for motor loads. Toggle type switches shall be non-fused, load break, having maximum ratings of 20a at 600v and 30a at 240v. Two-pole switches shall be similar to eaton arrow hart #6808f. Three-pole switches shall be similar to eaton arrow hart #7810f.

a. Knife-blade type switches shall be load break, quick-make-quick-break, ul class r up to 600a. Maximum rating except as noted shall be 800a. Arc quenchers shall be provided. Switches shall be similar to general electric qmr. All switch enclosures shall be dead front, nema type 1, except as noted.

C. Fuses: dual element fuses for motor loads shall be time delay having a maximum rating of 600a at required voltage. 200kaic fuses shall be similar to limitron fusetron frn or frs (ul class r). Current limiting fuses shall be utilized for other loads. 200kaic shall be similar to limitron ktn, kts, or ktu (ul class r up to 600a; class l over 600a). All fuses shall be provided by same manufacturer. Provide 1 spare matching fuse for each set of 3.

D. Circuit breakers: molded case breakers shall be thermal-magnetic, quick-make-quick-break, bolt-on type, manually operated with insulated trip-free handle. Multi-pole type breakers shall contain internal trip bar. Terminals shall be suitable for copper or aluminum cable. Furnish auxiliary devices where required for shunt tripping, open and close motor operator and alarm indication. Enclosures shall be dead front, nema type 1, as noted. Circuit breakers to be installed in existing panel boards, shall be of the same manufacturer, type and a.i.c. Rating as presently in use. Frames, ic and interchangeable trips shall be as follows, unless otherwise noted:

a. 120v, 100a frame: 10,000a, 1 pole

b. 240v, 100a frame: 18,000a, 2 and 3 poles

c. 240v, 200a frame: 50,000a, 2 and 3 poles

d. 277v, 100a frame: 14,000a, 1 pole

e. 480v, 100a frame: 20,000a, 2 and 3 poles

E. Distribution panels: switching units shall be 3 phase, 4 wire circuit-breaker type unless otherwise noted on panel schedules. Bus bars shall be hard drawn copper, minimum 98% conductivity, silver or tin-plated joints. Cabinets shall be galvanized sheet steel back box, with door and trim and lapped and welded corners. Hardware shall be chrome-plated with flush lock/latch handle assembly (up to 48" high doors) or vault handle, lock and 3-point catch (larger than 48" high doors). Hinges shall be semi-concealed, 5-knuckle steel with nonferrous pins, 180° opening, located a maximum 26" on centers. Provide door-in-door construction. Minimum gutter spaces for lighting panels shall be 5-3/4" sides, top and bottom. Directory holder shall be metal frame with clear plastic, transparent cover. A typewritten list indicating feeder cable and conduit size, circuit numbers, outlets supplied and their locations shall be provided.

F. Transformers shall be open-ventilated; dry type, class h insulation, 115°c temperature rise and windings shall be copper. Primary and secondary voltages shall be noted. Primary taps (6 - 2-1/2% taps, 2 above and 4 below rated voltage) shall be provided. Adjust for required voltage. Provide k rating and shielding as shown on drawings.

G. Balance the load over phases when new circuits are added to new or existing panels. Provide multi-cable lugs where required. Double lugging shall not be permitted. Mounting height shall be a maximum of 6'-6" from floor to top switch

unit. Update directories on existing panelboards where circuiting is changed.

H. Tests: open and close load break switching devices under load.

7. Surge protection devices

A. The individual surge protection device (spd) units shall be ul listed under ul1449 standard for transient voltage surge suppressions and the surge ratings and short circuit capacity rating shall be permanently affixed to the cover of spd. The unit shall also be complementary listed to ul 1283 standard for emi/rfi facility filters.

B. System description

a. The spd/filter shall be constructed using multiple surge current diversion arrays of metal oxide varistors (mov), matched to 1% variance. The array shall consist of multiple gap-less metal oxide varistors, with each mov individually fused. The arrays shall be designed and constructed in a manner, which ensures mov surge current sharing. No gas tubes, silicon avalanche diodes or selenium plates/rectifiers shall be used. The status of each array shall be continuously monitored and a green led shall be illuminated if the array is in full working order. All protection modes, including n-g, shall be closely monitored and internally fused, for compliance to nec article 110.9, 110.10 and 280.22.

C. Basis of design (minimum rating to be 40 ka - l-l, 40 ka - l-g, 40 ka - l-n):

a. Liebert catalog nos.

- Acv 208110 for 208v, 3φ, 3w+g
- Acv 120y111rke for 208y/120v, 3φ, 4w+g
- Acv 480110 for 480v, 3φ, 3w+g
- Acv 277y111rke for 480y/277v, 3φ, 4w+g

D. Warranty

a. The manufacturer shall provide a limited five year warranty from the date of shipping against failure when installed in compliance with manufacturer's written instruction, ul listing requirements, and any applicable national or local electrical codes. Manufacturer shall make available for consultation, (local, national) engineering service support.

E. Manufacturer

a. Liebert acv series or approved equal by current technology or innovative technology.

F. Accessories

a. Unit status indicators

- The unit shall have an integral status circuit that monitors the operational status of all modes of protection, including line to neutral, line to ground and neutral to ground. No manual testing is required to confirm the integrity of the suppression and filter systems. If the system does fail, the green led light will go out and the red led light will be lit.

8. Grounding

A. An equipment-grounding conductor, commonly described as a “green wire” shall be provided for all branch circuits protected by overcurrent devices except for lighting branch circuits. “green ground” wire shall also be provided for flexible conduit and motor circuits

B. Provide raceways continuity tests of resistance of feeder conduits from service to point of final distribution using 1 conductor return. Maximum resistance shall be 25 ohms.

C. Maintain grounding continuity of interrupted metallic raceways with ground conductor, and in flexible conduit for feeders and motor terminal connections

9. Raceways

A. Conduit & fittings

a. Rigid metal conduit (rmc/rgs):
full-weight pipe, galvanized steel, threaded

- Permitted for feeders and branch circuits. Paint male threads of field-threaded conduit with graphite-base pipe compound and butt conduit ends. Touch up marred surfaces and field-cut threads, crc-cold galvanized.

- Fittings: nonsplit, threaded, steel or malleable iron. Zinc die cast not permitted

b. Electrometallic tubing (emt):
thin wall pipe, galvanized, threadless.

- Permitted for branch circuits only, in dry locations, dry walls, hung ceilings, hollow block walls and furred spaces. Emt shall not be permitted in raised floors.

- Fittings: compression type 2" and under. Set screw type 2-1/2" and larger. Galvanized rigid steel elbows, 2" or larger.

c. Flexible metal conduit(fmc):
continuous single strip, galvanized.

- Permitted for short connections where rigid conduit is impractical. From outlet box to recessed lighting fixture: provide minimum 4' and maximum 6' lengths. For final connection to motor terminal box, transformer and other vibrating equipment: provide with polyvinyl sheathing and ground conductor. Minimum length: 18' with slack. Connect ground conductor to enclosure or raceway at each end. For expansion joint crossings, cross at right angles and anchor ends.

- Fittings: angle wedge type with insulated throat

d. Wireways: wire shall be as noted, minimum #16 gauge steel with ground continuity. Finish shall be baked enamel. Covers shall be screw-on.

B. Accessories

a. Bushings: metallic insulated type.

b. Expansion fittings shall be installed at right angles with clip joint centered in expansion joint. Provide a length of run in accordance manufacturer's recommendations. Preset fittings shall allow for temperature variation.

C. Boxes

a. Outlet boxes: except as otherwise required by construction, devices or wiring, boxes shall be stamped steel, 4" square or octagon for fixtures. Boxes above ceiling shall be 1-1/2" deep. Boxes in ceiling or slab shall be 3" deep. Boxes in wall for fixtures shall be 2-3/4" deep. Boxes in wall for receptacles and switches shall be 1-1/2" deep. Furnish with raised covers and fixture studs where required.

- Without fixture or device: furnish blank cover. Offset back-to-back outlets with minimum 6" separation.

- Erect wall and switch outlets in advance of furring and fireproofing. Outlet boxes shall be set square and true with building finish. Secure to building structure by adjustable strap iron or grout in with masonry. Provide barriers between switches connected to different phases for voltages exceeding 150v to ground.

b. Junction and pull boxes: galvanized sheet steel with screw-on covers, except as noted. Furnish with insulated supports for cables. Locations shall be as noted or required and accessible.

c. Panel, junction and pull boxes shall be located clear of other trades. Conceal junction and pull boxes in finished spaces. Where necessary, reroute raceways or make other arrangements for concealment. Boxes shall be accessible. Support boxes from building structure, independent of conduit. Provide floor-to-ceiling channels for mounting on drywall and lightweight construction. Outlet boxes for fixtures recessed in hung ceilings shall be accessible through opening created by removal of fixture. Secure to black iron or galvanized steel channel support. Motor terminal boxes: coordinate with motor branch circuit conduit and wiring; add box volume where required.

D. Support

a. Provide raceway support utilizing ceiling trapeze, straphangers, or wall brackets. Provide u-bolts at each floor level of riser raceways and connected to acceptable supports. Provide riser clamps at each floor level of riser raceways and resting on slab.

b. For through-the-floor systems, utilize an assembly similar to hubbell fire rated poke-through-floor box system. For above floor fittings, telephone shall be bushed hole and power shall be duplex receptacle or other as noted. Provide separation barrier between power and telephone compartments. Provide junction box on underside of floor. Pack fitting to restore fire rating of floor.

c. For hung ceiling outlets, run in hung ceiling and connect to ceiling support channels. In masonry and poured concrete, run vertically only.

10. Wire & cable

A. Provide wire and cable complete with accessories. Size reference shall be awg except as noted.

B. Conductors shall be copper, astm standard solid (#10 and smaller) or stranded (#8 and larger). General use cabling shall be #12 minimum.

a. Control and alarm cabling, except as noted, shall be #14 minimum. At 120v and over 200' circuit length provide #12 minimum.

b. Other voltages and phases: adjust cable sizing as required to maintain voltage drop. Increase raceway sizes for larger wire as required.

C. Insulation shall be rubber and thermoplastic meeting astm and ipcea standards.

a. Type thw, thwn shall be utilized for branch circuits except as noted.

b. Type thhn, thhw, thw-2 shall be utilized for feeders except as noted.

c. Type sff-2 shall be utilized for branch circuits located in wiring channels of continuous fluorescent fixtures and in ambient temperatures over 90°c.

d. For ungrounded isolated branch circuits provide cross-linked polyethylene insulation (type xhhw).

e. Pre-manufactured hospital grade armored cable (acthh) shall be utilized for all normal branch circuits in dry hollow stud wall locations, above accessible ceiling and where permitted by article 320 & 517 of the national electrical code only. Minimum conductor size shall be #12 awg copper with integral green insulated continuous ground conductor and bare bonding conductor in direct contact with the outer metal jacket.

D. The insulation of all conductors shall be 90°c rated thermoplastic with color coding as follows:

a. 120/208v system

- Black for a phase
- Red for b phase
- Blue for c phase

b. 277/480v system

- Brown for a phase
- Orange for b phase
- Yellow for c phase

c. Neutral wire shall utilize white outer covering throughout. Equipment ground wire shall utilize green outer covering throughout.

- Where color-coded cable is not available, certify in writing and request permission to overlap conductors with 6" of color taping in accessible locations.

E. All emergency branch circuit wire shall be run in conduit.

F. Provide flameproof linen or fiber tags in accessible locations. For feeders indicate feeder number, size, phase and points of origin and terminations. For control and alarm wiring indicate type (control or alarm), size of wire, and points of origin and terminations.

G. Terminations, splices and taps under 600v: copper conductors #10 and smaller shall utilize compression-type of twist-on spring-loaded connectors and clear nylon-insulated covering. Copper conductors #8 and larger shall utilize mechanical bolted pressure or hydraulic compression type using manufacturer's recommended tooling. Cable lugs and connectors shall utilize compression type of same metal as conductor. Provide to match cable, with marking indicating size and type. Copper lug connections to bus bars: use anti-seize compound on tang.

H. Not more than 3 lighting or convenience outlet circuits shall be installed in one conduit unless otherwise indicated. Provide separate raceways for conductors of 120/208v and 277/480v systems, except 460v motor branch circuit wiring and related 120v control wiring. Thermoplastic wires shall not be installed in computer area raised floors.

11. Control wiring

A. Provide all control wiring for motors and equipment furnished under all contracts and as specifically shown on the drawings, except as noted for mechanical/plumbing equipment. Include mounting and wiring of all control devices furnished with equipment.

B. Control wiring less than 120v for motors, alarms for equipment furnished under mechanical/plumbing will be provided under division 15 contract.

12. Devices

A. Local switches

a. Conventional quite single-pole toggle type, rated at 20 amp, 120/277v ac. Provide similar to:

P&s #20ac1, cooper #2221, hubbell #cs1221

b. Conventional quite three-pole toggle type, rated at 20 amp, 120/277v ac. Provide similar to:

P&s, #20ac3, cooper #2223, hubbell #cs1223

c. The owner or architect shall select toggle color.

B. Manual motor starters

a. Flush mounted type with integral thermal overload protection and pilot light. For single pole, provide similar to:

P&s #20ac2-hp, leviton #ms302, hubbell #hbl7832d

C. Insertion receptacles

a. Conventional duplex convenience 125v, 2 pole, 3 wire, 20a with u ground slot grounded, except as noted. Provide similar to:

P&s #5352, hubbell #cr5352, leviton #5352, cooper #5352

b. Ground fault interrupter with self-protection and led indicator light. Provide similar to:

P&s #2091, hubbell #gf20il, leviton #8898-hgi

c. Architect shall select face color and orientation. Devices used on emergency branch circuits shall be red face only

d. Device shall meet or exceed

- Ul 488
- Ul federal specification wc-596 listing.
- Nema wd-1 and wd-6

e. Special receptacles

- The trade contractor shall be responsible to provide special receptacles required to match provided, existing and new equipment plugs.

D. Device plates

a. Brushed 302 stainless steel with engraved circuit identification plate when used together with emergency branch circuit device. Refer to specification section 5- a-9.

b. Reinforced thermoplastic by same manufacturer of devices.

13. Lighting fixtures

A. Manufacture and install lighting fixtures in accordance with nec article 410.

B. Provide all lighting fixtures indicated, complete with lamps. Include all interior lighting fixtures, and all exterior fixtures mounted on the building.

C. Furnish all plaster frames or dry wall and deliver to project site for installation under finishes, division 9.

D. Use fixtures conforming to ul standards, and bearing ul label and union label.

E. Provide appropriate mounting accessories for each fixture, compatible with the various structural conditions that will be encountered. Provide fastening clips (earthquake clips) for lighting fixtures that are supported from framing members of suspended ceilings.

F. Assemble, wire and install all lighting fixtures at their respective outlets as indicated and assume responsibility for their condition until acceptance by owner. Install proper lamps in each fixture.

G. Fixture connections to branch circuits shall be made using stranded wire with insulation temperature rating equal to or higher than that or wire supplied with the fixture, or specified by fixture manufacturer. Fixtures are to be connected to branch circuits via junction box using flexible conduit no greater than 6'.

H. Note that specifications for recessed fixtures generally do not include mounting accessories, and that each fixture type may be used in several different ceilings, such as lay-in exposed grid, concealed spline tile, or drywall. Verify mounting details for each space before ordering fixtures so that proper quantities for each condition will be delivered in time to avoid construction delays.

I. Securely fasten lighting fixtures to framing members of suspended ceilings with fastening clips, as specified. Clip each fixture to all adjoining framing members to prevent movement of the members away from the fixtures.

J. Support exit signs in tile ceilings with rails that span between runners of ceiling suspension system. Use flanged fixtures for finished appearance.

K. Support fixtures in drywall ceilings from plaster frames, with adjustable lugs on side of fixture or yoke mounting as recommended by fixture manufacturer. Use flanged fixtures for finished appearance, unless otherwise noted.

L. Locate fixture in center of panel where used in modular tile ceilings, unless otherwise noted. Refer to reflected ceiling plan.

14. Empty raceway systems

A. A complete empty raceway system consisting of blank 4-11/16"sq.x2-1/8" deep outlet boxes with single or double gang drywall finish collar as noted. Metallic raceway with pull string shall be provided and installed where shown for the following systems.

a. Telephone/data (single gang)

b. Medical monitoring cabling (double)

c. Cable television (single gang)

B. Raceway size shall be a minimum of 3/4" or as documented in plans and details.

C. All metallic raceway systems shall be stubbed up and terminate in accessible ceiling. End bushings and pull wires shall be provided. Bonding of all raceway systems to provide a common ground path shall be provided.

D. Actual devices, connectors, wiring complete with terminations and box covers shall be provided by others.

15. Fire stopping

A. Drawings and general provisions of contract, including general and supplementary conditions and division specification sections, apply to work of this section.

B. Provide all required fire stopping. Work includes fire-stopping penetrations of fire- resistance rated floors, walls and partitions in new construction, as well as pre-existing penetrations in renovation areas of existing construction.

C. Product data: submit manufacturer's product data for each fire-stopping produce required, including instructions for substrate preparation and fire-stopping installation.

D. Fire resistant joint sealers: provide manufacturer's standard fire-stopping sealant with accessory materials, having fire resistance ratings indicated as established by testing identical assemblies per astm e814 by underwriters laboratory, inc. Or other testing and inspecting agency acceptable to authorities having jurisdiction.

E. Materials - provide the following:

a. One-part fire-stopping sealant: one part latex based intumescent sealant formulated for use in a through-penetration fire-stop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors. Acceptable products/manufacturers include the following:

- Spec seal lc150 series
- Hilti fs one

16. Tests

A. Before making tests, complete all connections at panels, fixtures and other equipment. Install fuses and have all wiring continuous from service equipment to utilization outlets. Correct all undesirable ground, open and short circuit conditions.

B. Provide source of temporary power for making tests if normal building power is not available at the time.

C. Take and record the following readings on systems 600v and below:

a. Perform continuity and insulation tests. Megger tests of all feeder circuit conductors, ground conductors, and conduit ground. Megger test 10% of branch circuits and all motor branch circuits over 25 hp.

b. Ammeter readings on all phases and neutral of each feeder to indicate balance.

c. Ammeter readings on all phases of each polyphase motor. Include nameplate full load current of each motor on data sheet.

d. Certify that all overload devices have been set in accordance with data shown on the drawings and/or manufacturer's recommended setting.

D. Send final certified test reports and certifications to the architect for approval and transmittal to the owner.

17. Demonstration of complete electrical systems

A. Submit written certification that electrical systems are complete and operational. Submit certification with contractor's request for final review.

a. At the time of final review of electrical work, demonstrate the operation of electrical systems. Furnish labor, apparatus and equipment for systems' demonstration. The various test shall be witnessed by and the owner or his representative.

B. The contractor shall furnish all test equipment, materials, labor, and temporary power hook-ups to perform start-up and all tests as required to obtain final field acceptance from owner. All tests shall be conducted in the presence of the owner or his representative. All test procedures shall conform to this specification and applicable standards the ansi, ieee, nema, osha, nepa, etc

C. The contractor shall be responsible for all tests and test record. Testing shall be performed by and under the immediate supervision of the contractor. Test record shall be kept for each piece of equipment. Copies shall be furnished to the engineer for review and/or approval.

D. A visual inspection of all electrical equipment, to check for the foreign material, tightness or wiring and connection, proper grounding, matching nameplate charts with specification, etc., shall be made prior to actual testing.

E. A complete operational test shall be made on the revised life safety fire alarm system. The contractor shall consult with the equipment vendors and then submit for approval a step-by-step procedure describing the method of making the tests, the equipment to be utilized and the feature to be checked by the test. All interlocks and protective features shall be checked out.

18. Special engineering services

A. In the instance of complex or specialized electrical systems such as emergency system fire alarm or similar miscellaneous systems, the installation, final connections and testing of such systems shall be made under the direct supervision of competent authorized service engineers who shall be in the employ of the respective equipment manufacturer.

B. Any and all expenses incurred by these equipment manufacturers' representatives related to this project, shall be borne by the electrical contractor.

19. Design modifications

A. The drawings show electrical systems, which supply, control, and/or monitor systems specified elsewhere. The electrical system shown has been based on specific manufacturers data or information conveyed to the electrical designer. Where any agreement or change is made to supply equipment of larger capacity or different electrical characteristics, the contractor shall be responsible for providing the electrical system to affect such changes within the intent of these specifications and to inform the engineer, in writing, of such change. For example, if hvac compressors and/or motors are allowed to be changed to 230v rather than the originally specified 208 volts, boosting or bucking transformers shall be supplied, installed, and wired to accommodate the change at no additional cost.

20. Fire alarm

A. Electrical contractor shall provide all components necessary for a ul listed fully functioning, networked, conventional intelligent proprietary fire alarm system in accordance with code. The contractor shall submit each of the following:

a. Product data for each type of component specified including dimensioned plans and elevations.

b. System operation description, including method of operation and supervision of each type of circuit and sequence of operations for all manually and automatically initiated system inputs and outputs.

c. Battery calculations, riser diagrams, device and panel cutsheets, and voltage calculations for the fire alarm system to the code official for final approval prior to beginning any work related to the fire alarm system.

END OF SECTION

SECTION 311000

SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Stripping and stockpiling rock.
6. Removing above- and below-grade site improvements.
7. Temporary erosion and sedimentation control.

1.2 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.

C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction as shown on Drawings.

E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site

1.4 MATERIAL OWNERSHIP

A. Cleared materials in access shall become Contractor's property and shall be removed from Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

B. Topsoil stripping and stockpiling program.

C. Rock stockpiling program.

D. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

A. Topsoil Stripping and Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

B. Rock Stockpiling Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.7 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

2. Construction entrances to be installed per plans. Contractor will not deviate from entrances a shown.

B. Utility Locator Service: Notify utility locator service and Pennsylvania One Call for area where Project is located before site clearing. Contractor to be responsible to have all utilities marked by utility locator before site clearing. Utility mark-outs to remain visible throughout construction.

C. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.

D. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified on the plans.

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain and that protection zones have been identified and enclosed according to the approved Erosion and Sedimentation Plans.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 EROSION AND SEDIMENTATION CONTROL

A. Provide erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site according to requirements in the approved plans.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations.

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated on the plans to be removed

1. Arrange with utility companies to shut off indicated utilities.
2. Owner will arrange to shut off indicated utilities when requested by Contractor.

B. Locate, identify, and disconnect utilities indicated to be abandoned in place as shown on the plans.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Grind down stumps and remove all roots below exposed subgrade.
3. Use only hand methods or air spade for grubbing within protection zones.
4. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to one half the width of disturbance.
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 STOCKPILING ROCK

A. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.
1. Dispose of surplus rock. Surplus rock is that which exceeds quantity indicated to be stockpiled or reused.

3.8 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Burning tree, shrub, and other vegetation waste is not permitted.

C. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION

SECTION 312000

EARTH MOVING

1.1 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses.
3. Drainage course for concrete slabs-on-grade.
4. Subbase course for concrete walks and pavements.
5. Subbase course for asphalt paving.
6. Subsurface drainage backfill for walls and trenches.
7. Excavating and backfilling trenches for utilities and pits for buried utility structures.

1.2 UNIT PRICES

A. Work of this Section is affected by unit prices for earth moving specified in previous sections. Base price is to include 100 cubic yards of rock removal. Unit Prices for Rock Excavation over 100 cubic yards is to be provided as described in previous sections.

B. Quantity allowances for earth moving are included in previous sections.

C. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.

1. 24 inches outside of concrete forms other than at footings.
2. Outside dimensions of concrete walls indicated to be cast against rock without forms as approved by project geotechnical engineer.
3. 6 inches beneath pipe in trenches including underground storm basins and the greater of 12 inches wider than pipe

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock Excavation for Trenches and Pits: Removal and disposal of materials and obstructions encountered that cannot be excavated with a track-mounted power excavator, equivalent to Caterpillar Model NO. 325B, 168 HP, 48,350 lb. drawbar pull and 36 inch bucket rated at 1.0 cubic yard capacity. Trenches in excess of 10 feet in width and pits in excess of 30 feet in either length or width are classified as bulk excavation.

I. Rock Excavation in Bulk Excavation: Removal and disposal of materials and obstructions encountered that cannot be dislodged and excavated with modern, track-mounted, heavy-duty excavating equipment. Heavy-duty excavating equipment is considered equal to Caterpillar Model No. D-8 Ripper Tractor or equivalent track-mounted loader, rated at not less than 84,850 pounds operating weight, 310 HP rated power and developing minimum of 50,070-pound bucket breakout force (measured in accordance with SAE J732). Excavation which can be accomplished with this equipment or equivalent is considered as Earth Excavation.

J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

L. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

M. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct preexcavation conference at project site.

1. Review methods and procedures related to earthmoving, including, but not limited to, the following:

a. Personnel and equipment needed to make progress and avoid delays.
b. Coordination of Work with utility locator service.
c. Coordination of Work and equipment movement with the locations of tree- and plant-protection zones.
d. Extent of trenching by hand or with air spade.
e. Field quality control.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles.
2. Controlled low-strength material, including design mixture.
3. Warning tapes.

B. Samples for Verification: For the following products, in sizes indicated below:

1. Geotextile: 12 by 12 inches
2. Warning Tape: 12 inches long; of each color.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D2487.
2. Laboratory compaction curve according to ASTM D698.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving begins.

D. PADEP Clean Fill and Regulated Fill Standards: Show that excavation material leaving the Site meet standards as determined by the Pennsylvania Department of Environmental Protection Standards.

E. NPDES: Show excavation material placed off-Site is in an area regulated by a current NPDES permit as issued by a County Conservation District and Pennsylvania Department of Environmental Protection.

1.7 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

1.8 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify utility locator service and Pennsylvania "One Call" for all areas where Project is located before beginning earth-moving operations.

C. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified on the drawings are in place.

D. Do not commence earth-moving operations until plant-protection measures specified on the plans are in place.

E. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.

6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Do not direct vehicle or equipment exhaust towards protection zones.

G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PRODUCTS

1.9 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification according to AASHTO M 145, or as approved by the Project Geotechnical Engineer free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification according to AASHTO M 145, or as determined by the Project Geotechnical Engineer.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of clean crushed stone ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

I. Sand: ASTM C33/C33M; fine aggregate.

1.10 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Survivability: As follows:

    a. Grab Tensile Strength: 157 lbf; ASTM D4632.
    b. Sewn Seam Strength: 142 lbf; ASTM D4632.
    c. Tear Strength: 56 lbf; ASTM D4533.
    d. Puncture Strength: 56 lbf; ASTM D4833.

3. Apparent Opening Size: **No. 60** sieve, maximum; ASTM D4751.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Survivability: As follows:

    a. Grab Tensile Strength: 247 lbf ; ASTM D4632.
    b. Sewn Seam Strength: 222 lbf ; ASTM D4632.
    c. Tear Strength: 90 lbf ; ASTM D4533.
    d. Puncture Strength: 90 lbf ; ASTM D4833.

3. Apparent Opening Size: No. 60 sieve, maximum; ASTM D4751.
4. Permittivity: 0.02 per second, minimum; ASTM D4491.
5. UV Stability: 50 percent after 500 hours' exposure; ASTM D4355.

1.11 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic

core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

EXECUTION

1.12 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

D. Perform testing that might be required to assure excavation material that leaves the Project site meets the PADEP Clean Fill and Regulated Fill Standards.

1.13 DEWATERING

A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

1.14 EXPLOSIVES

A. Explosives: Not Permitted.

1.15 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation over 100 cubic yards according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

    a. Intermittent drilling; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:

    a. 24 inches outside of concrete forms other than at footings.
    b. 12 inches outside of concrete forms at footings unless otherwise reviewed and approved by Project geotechnical engineer.
    c. Outside dimensions of concrete walls indicated to be cast against rock without forms as approved by Project geotechnical engineer.
    d. 6 inches beneath pipe in trenches including underground detention basins and the greater of 12 inches wider than pipe.

1.16 EXCAVATION FOR STRUCTURES OTHER THAN BUIDLING

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of

plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

1.17 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

1.18 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of pipe in accordance with the plans.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit if not otherwise indicated on the plans.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
1. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
2. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

1.19 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction**,** repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed by Project geotechnical engineer.

D. Authorized additional excavation rock over 100 cubic yards and replacement material will be paid for according to Contract provisions for unit prices

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

1.20 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

1.21 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

1.22 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Backfill voids with satisfactory soil while removing shoring and bracing.

D. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of subbase material or satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

    a. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
2. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

F. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

1.23 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

1.24 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

1.25 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D1557:
1. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
2. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.
3. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

4. For concrete pads and pavement for athletic equipment, final backfill soil material at 90 percent.

1.26 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch
2. Walks: Plus or minus 1/8 inch.
3. Pavements: Plus or minus 1/2 inch.

1.27 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends if required per the plans.
2. For asphalt paving, place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase course and base course to required crown elevations and cross-slope grades.
4. Place subbase course and base course 6 inches or less in compacted thickness in a single layer.
5. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D698.

1.28 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
4. The amount of rock excavated

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 1000 sq. ft. or less of paved area or building slab but in no case fewer than three tests.
2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 100 feet or less of trench length but no fewer than two tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

F. Owner will provide licensed surveyor to verify utilities are installed to proper slope as indicated on the plans. After installation of utility in a trench, backfill of the trench will not occur until surveyor has confirmed elevations. Compensation will not be issued to correct installation.

1.29 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

1.30 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

SECTION 321243

POROUS / PERMEABLE PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Porous / permeable paving using gravel pavers.

1.2 RELATED REQUIREMENTS

A. Section 31 20 00 – Earth Moving: Subgrade preparation.

1.3 REFERENCE STANDARDS

A. ASTM F1667 – Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

1.4 PREINSTALLATION MEETINGS

A. Convene preinstallation meeting 1 week before start of Work of this Section.

B. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, installer, and manufacturer's representative.

C. Review the Following:
1. Materials.
2. Protection of in-place conditions.
3. Preparation.
4. Installation.
5. Adjusting.
6. Protection.
7. Coordination with other Work.

1.5 SUBMITTALS

A. Comply with Division 1.

B. Product Data: Submit manufacturer's product data, including preparation and installation instructions.

C. Samples: Submit manufacturer's sample of one 24-inch by 24-inch gravel paver.

D. Submit Material Certification / Gradation Analysis for base course and gravel fill.

E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

F. Manufacturer's Project References: Submit manufacturer's list of successfully completed gravel paver projects, including project name and location, name of architect, and type and quantity of gravel pavers furnished.

G. Installer's Project References: Submit installer's list of successfully completed gravel paver projects, including project name and location, name of architect, and type and quantity of gravel pavers installed.

H. Warranty Documentation: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of gravel pavers of similar type to that specified.

B. Installer's Qualifications:
1. Installer regularly engaged, for a minimum of 5 years, in installation of gravel pavers of similar type to that specified.
2. Employ persons trained for installation of gravel pavers.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery Requirements: Deliver gravel pavers to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
1. Store and handle gravel pavers in accordance with manufacturer's instructions.
2. Keep gravel pavers in manufacturer's original, unopened containers and packaging until installation.
3. Store gravel pavers in clean areas, protected from exposure to harmful weather conditions.
4. Store gravel pavers out of direct sunlight.
5. Protect gravel pavers during storage, handling, and installation to prevent damage.

1.8 AMBIENT CONDITIONS

A. During Cold Weather:
1. Do not use frozen materials.
2. Do not use materials mixed or coated with ice or frost.

3. Do not build on frozen Work.

B. During Wet Weather: Do not build on wet, saturated, or muddy subgrade.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: NDS, Inc., 851 North Harvard Avenue, Lindsay, California 93247. Toll Free 800-726-1994. Phone 559-562-9888. Toll Free Fax 800-726-1998. Fax 559-562-4488. Website www.ndspro.com. Email nds@ndspro.com.

B. Substitutions: Substitutions require County approval for a product equal or better than specified product.

2.2 MATERIALS

A. Grass Pavers: NDS "Tufftrack" pavers, model "TT-24".

Composition and Dimensions:

1. Injection-molded, nested-honeycomb, polyolefin plastic-panel gravel pavers for permeable, natural-gravel paved environments.
2. Load-bearing paving system.
3. Use full rigid base course to prevent pavers from being pressed into subbase.
4. Material: 100 percent recycled polyolefin plastic with carbon black for UV stabilization.
5. Recyclable Content: 100 percent.
6. Paver Size: 24 inches by 24 inches by 1-1/2 inches high.
7. Wall Thickness: 0.12 inch.
8. Cells:
    a. Number per Paver: 120.
    b. Shape: Hexagon.
    c. Size: 2-1/2-inches.
    d. Form: Nested honeycomb.
9. Bottom of Each Cell:
    a. 1-1/4-inch-diameter hole in center.
    b. Six 0.475-inch by 0.212-inch perimeter slot openings through bottom of paver.
    c. One opening at bottom of each cell wall to discourage root girdling within cell.
10. Bottom Surface of Pavers: Flat, without vertical posts or obstructions.
11. Top Surface of Pavers: Smooth, without notches or grooves.
12. Latching System Between Pavers:
    a. Tongue-and-groove latching system molded around perimeter lock pavers together.
    b. Does not require additional parts or tools.
    c. Tongues: 1 inch by 1 inch by 0.12 inch thick.

d. Grooves: 1 inch by 0.12 inch.

13. Bottom Open Area: Greater than 41 percent, across entire bottom surface.
    a. Total Bottom Open Area per Paver: Greater than 228 square inches.
14. Paver Color: Black.
15. Nominal Coverage Area per Paver: 4 square feet.
16. Weight per Paver: 4.5 pounds.
17. Chemical Resistance: Superior chemical resistance; totally inert.

Performance:

18. Paver Compressive Strength, Empty Cells: 86,563 lbs (601 psi)
19. Paver Compressive Strength, Cells Filled with 3/8 inch Gravel: 500,000 lbs.

B. Fill Inside Pavers: Native Top Soil OR Sandy Loam OR Loam Soil. Sand and native soil with high clay content are nor recommended.

C. Base Course below Pavers: AASHTO #57 or equivalent from local sources, passing the following sieve analysis:

Percent Passing	Sieve Size
100	1 1/2 inch
95-100	1 inch
25-60	½ inch
0-10	#8

NDS recommends rock of igneous origin. The use of limestone is prevalent in the South and Southeastern Regions of the US. The Engineer-of-Record shall refer to his/her State's Department of Transportation (DOT) Standard Specification guidelines regarding the use of limestone in the base course. If limestone rock is used, NDS recommends that a Los Angeles Abrasion Test be performed. The abrasion values recommended by the DOTs varies by state, and ranges from 30 to 45. NDS recommends that the abrasion value shall not exceed 30.

Note:

1. Contact NDS if locally available materials do not meet the above gradation.
2. Sources of the material may include locally-available pit run or crusher run.
3. Confirm base course gradation by performing sieve analysis.
4. Perform Los Angeles Abrasion Test per AASHTO T96 or ASTM C131 if limestone is used.

Engineer / Landscape Architect may consider adding and blending pulverized top soil to the aggregate base in the upper 2 to 3 inches of the base course. The volume of topsoil added to the base course is recommended to not exceed 20% of the volume of the base course in the upper 2 to 3 inches. NDS recommends that this option be evaluated and revised as-needed for site-specific conditions (e.g., depth of root zone for the chosen grass variety, etc).

Engineer may also consider adding 2 inches of sandy loam material between the paver and the gravel base course. If this is done, a non-woven geotextile filter fabric is recommended between the sandy loam and the base course to prevent migration of fines into the base course.

D. Filter Fabric: Use non-woven, needle-punched geotextile filter fabric. Use filter fabric with Apparent Opening Size (AOS) <0.60 mm for native soils with 50% or less particles by weight passing No. 200 sieve and AOS <0.30 mm for native soils with 50% or greater particles by weight passing the No. 200 sieve. Woven geotextiles should not be used.

E. Erosion Control Blankets: Use erosion control blankets, e.g., coir blankets made of biodegradable fiber, to increase soil stabilization and decrease erosion while vegetation takes root. ECBs may be used in areas where shade or cold temperatures increase seed germination time.

F. Under Drain: Use minimum 4-inch diameter perforated PVC or polyethylene pipe. Recommended 2 square inches of opening per linear foot of pipe.

G. Anchors: Use NDS 3/8 in x 12 in long galvanized steel stakes (Part No. GPSTAKES) with Fastenal or equivalent 3/8 inch I.D. x 2" O.D. X 0.406" Thick Fender Washers.

PART 3 EXECUTION

3.1 PREPARATION

A. Examine areas to receive pavers. Paver installation shall not occur when excavated and exposed subgrade native soil area that is to receive the base course has ponding water or ice. Do not begin preparation or installation until these unacceptable conditions are corrected.

B. Excavate to the required depth and compact Native Soil as follows:
   1. Compact subgrade native soils 90 to 95% standard proctor density per ASTM D696 for soils with California Bearing Ratio >20%, R value >30, AASHTO A-1, A-2, and A-3 soils. Lower compaction levels promote infiltration through soil.
   2. NDS recommends that Engineer-of-Record consider higher level of compaction for native soils with CBR 5 to 20%, R-value 10 to 30, AASHTO A-4 soils for heavy loads (e.g., fire trucks) where infiltration into native soils is not a requirement.
   3. NDS recommends that Engineer-of-Record consult with Project Geotechnical Engineer for potential soil modification (e.g., lime treatment) and compaction level for CBR <5% and R-value <10, AASHTO A-5, A-6, and A-7 soils.

C. Install filter fabric per manufacturer's recommendation.

D. Place Base Course material over prepared subbase to grades indicated on the Drawings, in lifts not to exceed 6 inches. Since it is difficult to measure density of coarse aggregate, approach of

requiring a fixed density is not applicable. Compact Base Course with one to three passes of 5-ton steel wheel roller or equivalent. Base Course thickness is based on native soil conditions and anticipated wheel loads.

If pulverized top soil is added to the base course in the upper 2 to 3 inches, it shall be blended in prior to placement to produce a homogenous mixture, and this mixture shall be placed as a separate lift.

E. Install perforated under-drain within the base course layer.

3.2 INSTALLATION

A. Install pavers by placing units with cells facing up and connecting tongue and groove locks. NDS recommends installing pavers in a staggered pattern.

B. Clearance: Leave 1-inch-minimum clearance between gravel pavers and fixed objects or surface structures.

C. Top of Cells: Leave top of cells 1/4 inch to 1/2 inch below surface of adjacent hard-surface pavements.

D. Fill the top soil in cells as pavers are laid in sections.

E. Extend topsoil fill inside pavers ¼ inch to ½ inch above paver surface and match surrounding grade. When topsoil fill is properly installed, paver cells will have minimum visibility.

F. Planting: Plant grass by seeding.

G. Fill grass pavers with soil and plant within 30 days of being installed. Seeding, fertilizing, watering procedure, and turf maintenance shall be per local conditions.

H. Place Erosion Control Blankets over filled and seeded grass pavers.

I. Re-inspect paver tongue and groove locking prior to filling with topsoil if not filled on same day of installation. Make necessary corrections if displacement has occurred since installation. Remove and replace with new pavers where 3 or more adjacent cells are broken nor damaged.

3.3 PROTECTION

A. Work area consisting of pavers shall be opened to traffic only when sufficient grass cover has been established to handle traffic. Project's Landscape Architect to consider irrigation of areas that receive seed or sod in order to establish and sustain the grass cover for maximum performance of the surface.

3.4 MAINTENANCE TIPS

A. Utilize skid shoes or raise snow plow a minimum of 2 inches above the paver surface.

B. Plant turf that is resistant to thatch.

C. Do not use equipment intended for thatching or scalping over the pavers.

3.5 NOTES:

1. TT24 with Soil Fill and Grass Cover is recommended for the following applications:

   - Occasional Use* Overflow Parking Lots with following vehicles:
     Class 1** (Motorcycles)
     Class 2** (Passenger cars with trailers)
     Class 3** (Pickup Trucks with trailers)
     Class 5** (Two axle, six tire, single unit vehicles)
   - Emergency / Fire Lanes with applicable vehicles

   *Occasional use is the period of time that will allow grass to recover after a single use. It is based on local soil and weather conditions.
   **All vehicle classes per Federal Highway Administration Vehicle Classification

2. Do not install TT24 permeable pavers with Soil Fill and Grass Cover:
   - In areas subjected to frequent traffic as grass will wear out and will not have sufficient period of time to recover (e.g., residential driveways and regular parking lots).
   - In areas subjected to heavy semi-trucks with trailers.
   - In areas subjected to movement of trash-hauling trucks
   - As playground surfaces.

3. NDS recommendations for TuffTrack TT24 with Grass fill for slopes are as follows:

Slope	Recommendation
Up to 5%	Up to Class 3 vehicles. Emergency vehicle access roads shall be staked with 4 stakes per panel at all corners.
5% to 10%	Light vehicles like golf carts. Also, anchoring (2 stakes per panel at diagonally opposite corners or 4 stakes per panel at all corners) is recommended.
Greater than 10%	Not recommended

END OF SECTION

SECTION 321723

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes painted markings applied to asphalt pavement.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site

1. Review methods and procedures related to marking pavement including, but not limited to, the following:

a. Pavement aging period before application of pavement markings.
b. Review requirements for protecting pavement markings, including restriction of traffic during installation period.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.

B. Shop Drawings: For pavement markings.

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

C. Samples: For each exposed product and for each color and texture specified; on rigid backing, 8 inches square.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of PADOT for pavement-marking work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in ADA Standards for Accessible Design and ICC A117.1

2.2 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint, Parking Lots : Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248.

1. Color: As indicated

B. Glass Beads, for cross walks : AASHTO M 247, Type 1 made of 100 percent recycled glass.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions.

B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to pavement. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal.

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 329113

SOIL PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes planting soils and layered soil assemblies specified by composition of the mixes.

B. Related Requirements:
   1. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
   2. Section 329300 "Plants" for placing planting soil for plantings.
   3. Section 329600 "Transplanting" for placing planting soil in tree planting pits.

1.3 ALLOWANCES

A. Preconstruction and field quality-control testing are part of testing and inspecting allowance.

1.4 DEFINITIONS

A. AAPFCO: Association of American Plant Food Control Officials.

B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended, or unamended soil as indicated.

C. CEC: Cation exchange capacity.

D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

F. Imported Soil: Soil that is transported to Project site for use.

G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.

H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.

I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.

J. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

M. SSSA: Soil Science Society of America.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

Q. USCC: U.S. Composting Council.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analyses for aggregate materials.
4. Material Certificates: For each type of imported soil, soil amendment, and fertilizer before delivery to the site, according to the following:

    a. Manufacturer's qualified testing agency's certified analysis of standard products.
    b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.

c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Samples: For each bulk-supplied material, in volumes shown on Drawings of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each testing agency.

B. Preconstruction Test Reports: For preconstruction soil analyses specified in "Preconstruction Testing" Article.

C. Field quality-control reports.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

1. Laboratories: Subject to compliance with requirements.

2. Multiple Laboratories: At Contractor's option, work may be divided among qualified testing laboratories specializing in physical testing, chemical testing, and fertility testing.

1.9 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction soil analyses on existing on-site soil and imported soil.

1. Notify Architect seven days in advance of the dates and times when laboratory samples will be taken.

B. Preconstruction Soil Analyses: For each unamended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.

1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.10 SOIL-SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled in presence of Architect soil scientist (CPSS) certified by SSSA, Soil classifier (CPSC) certified by SSSA, Soil scientist (RPSS) registered by the National Society of Consulting Soil Scientists, or state-certified, -licensed, or -registered soil scientist under the direction of the testing agency.

1. Number and Location of Samples: Minimum amount of representative soil samples from varied locations where indicated on Drawings for each soil to be used or amended for landscaping purposes.
2. Procedures and Depth of Samples: As directed by Architect.
3. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
4. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.11 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:

1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":

   a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
   b. Hydrometer Method: Report percentages of sand, silt, and clay.

2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D698 (Standard Proctor).

C. Chemical Testing:

1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.

4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA NAPT NCR-13. SSSA NAPT NEC-67. SSSA NAPT SERA-6 or SSSA NAPT WERA-103, including the following:

1. Percentage of organic matter.
2. CEC, calcium percent of CEC, and magnesium percent of CEC.
3. Soil reaction (acidity/alkalinity pH value).
4. Buffered acidity or alkalinity.
5. Nitrogen ppm.
6. Phosphorous ppm.
7. Potassium ppm.
8. Manganese ppm.
9. Manganese-availability ppm.
10. Zinc ppm.
11. Zinc availability ppm.
12. Copper ppm.
13. Sodium ppm and sodium absorption ratio.
14. Soluble-salts ppm.
15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.

E. Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.

1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1000 sq. ft. (100 sq. m) for 6-inch (150-mm) depth of soil.
2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. (100 sq. m) for 6-inch (150-mm) depth of soil.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways, and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCT

2.1 PLANTING SOILS SPECIFIED BY COMPOSITION

A. General: Soil amendments, fertilizers, and rates of application specified in this article are guidelines that may need revision based on testing laboratory's recommendations after preconstruction soil analyses are performed.

B. Planting-Soil Type, Existing, on-site surface soil, with the duff layer, if any, retained; and stockpiled on-site; modified to produce viable planting soil. Blend existing, on-site surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Ratio of Loose Compost to Soil volume as shown on Drawings.
2. Ratio of Loose Sphagnum Muck Peat to Soil: by volume.
3. Ratio of Loose Wood Derivatives Soil: by volume.
4. Weight of Lime: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
5. Weight of Sulfur Iron Sulfate: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
6. Weight of Agricultural Gypsum: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
7. Weight of Superphosphate: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
8. Weight of Commercial Fertilizer: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
9. Weight of Slow-Release Fertilizer: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.

C. Planting-Soil Type Imported, naturally formed soil from off-site sources and consisting of sandy loam, loam, silt loam loamy sand or sand soil according to USDA textures; and modified to produce viable planting soil.

1. Sources: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches (100 mm) deep, not from agricultural land, bogs, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to, quackgrass, Johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and bromegrass.

2. Additional Properties of Imported Soil before Amending: Soil reaction of pH 6 to 7, and minimum of 2, 6 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.
3. Unacceptable Properties: Clean soil of the following:

    a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
    b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of **8** percent by dry weight of the imported soil.
    c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding dimensions shown on Drawings.

4. Amended Soil Composition: Blend imported, unamended soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

    a. Ratio of Loose Compost to Soil as shown on Drawings.
    b. Ratio of Loose Sphagnum Muck Peat to Soil: by volume.
    c. Ratio of Loose Wood Derivatives to Soil: by volume.
    d. Weight of Lime: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
    e. Weight of Sulfur Iron Sulfate: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
    f. Weight of Agricultural Gypsum: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
    g. Weight of Superphosphate: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
    h. Weight of Commercial Fertilizer: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.
    i. Weight of Slow-Release Fertilizer: per 1000 sq. ft. (100 sq. m) per 6 inches (150 mm) of soil depth.

D. Planting-Soil Type: Manufactured soil consisting of manufacturer's basic topsoil, sandy loam according to USDA textures, blended in a manufacturing facility with sand, stabilized organic soil amendments, and other materials to produce viable planting soil.

1. Additional Properties of Manufacturer's Basic Soil before Amending: Soil reaction of pH and minimum percentage of organic-matter content, friable, and with sufficient structure to give good tilth and aeration as shown on Drawings.
2. Unacceptable Properties: Manufactured soil shall not contain the following:

    a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
    b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of **5** percent by dry weight of the manufactured soil.
    c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 2 inches (50 mm) in any dimension.

3. Blend manufacturer's basic soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

    a. Ratio of Loose Compost to Soil by volume as shown on Drawings.
    b. Ratio of Loose Sphagnum Muck Peat to Soil: by volume.
    c. Ratio of Loose Wood Derivatives Soil: by volume.
    d. Volume of Sand: per cu. yd. (cu. m) Volume of Perlite: per cu. yd. (cu. m).
    e. Weight of Lime: per cu. yd. (cu. m).
    f. Weight of Sulfur Iron Sulfate: per cu. yd. (cu. m).
    g. Weight of Agricultural Gypsum: per cu. yd. (cu. m).
    h. Weight of Superphosphate: per cu. yd. (cu. m).
    i. Weight of Commercial Fertilizer: per cu. yd. (cu. m).
    j. Weight of Slow-Release Fertilizer: per cu. yd. (cu. m).

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through a No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through a No. 60 (0.25-mm) sieve.
2. Class: O, with a minimum of 95 percent passing through a No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through a No. 60 (0.25-mm) sieve.
3. Form: Provide lime in form of ground dolomitic limestone calcitic limestone mollusk shells
4. Retain one of or both "Sulfur" and "Iron Sulfate" paragraphs below if required. Do not use aluminum sulfate. Revise descriptions and insert proprietary products if required.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through a No. 40 (0.425-mm) sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Perlite: Horticultural perlite, soil amendment grade.

E. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through a No. 50 (0.30-mm) sieve.

F. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C33/C33M.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:

1. Feedstock: Limited to leaves May include sewage sludge May include animal waste.

2. Reaction: pH of 5.5 to 8
3. Soluble-Salt Concentration: Less than 4 dS/m.
4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 30 to 40 50 to 60 percent of dry weight.
6. Particle Size: Minimum of 98 percent passing through a 4-inch (100-mm) 2-inch (50-mm) 1-inch (25-mm) 1/2-inch (13-mm) sieve.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture with 100 percent passing through a 1/2-inch (13-mm) sieve, a pH of 3.4 to 4.8, and a soluble-salt content measured by electrical conductivity of maximum 5 dS/m.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture with 100 percent passing through a 1/2-inch (13-mm) sieve, a pH of 6 to 7.5, a soluble-salt content measured by electrical conductivity of maximum 5 dS/m, having a water-absorbing capacity of 1100 to 2000 percent, and containing no sand.

D. Wood Derivatives: Shredded and composted, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

1. Partially Decomposed Wood Derivatives: In lieu of shredded and composted wood derivatives, mix shredded and partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. (2.4 kg/cu. m) of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb./cu. ft. (4 kg/cu. m) of loose sawdust or ground bark.

E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.4 FERTILIZERS

A. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20, 33, 50 percent available phosphoric acid.

B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb./1000 sq. ft. (0.5 kg/100 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

C. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified testing agency.

D. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

PART 3 - EXECUTION

3.1 GENERAL

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING

A. Excavation: Excavate soil from designated area(s) to a depth of and stockpile as shown on Drawings until amended.

B. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

C. Unsuitable Materials: Clean soil to contain a maximum percentage shown on Drawings by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

D. Screening: Pass unamended soil through a sieve to remove large materials.

3.3 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply and mix unamended soil with amendments on-site to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to a minimum depth as shown on Drawings. Remove stones sticks, roots, rubbish, and other extraneous matter larger than dimensions shown on Drawings and legally dispose of them off Owner's property.

1. Apply, add soil amendments, and mix approximately half the thickness of unamended soil over prepared, loosened subgrade according to "Mixing" Paragraph below. Mix thoroughly into top of subgrade as shown on Drawings. Spread remainder of planting soil.

C. Mixing: Spread unamended soil to total depth as shown on Drawings but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

1. Amendments: Apply soil amendments, except compost, and fertilizer, if required, evenly on surface, and thoroughly blend them with unamended soil to produce planting soil.

    a. Mix lime and sulfur with dry soil before mixing fertilizer.
    b. Mix fertilizer with planting soil no more than seven days before planting.

2. Lifts: Apply and mix unamended soil and amendments in lifts not exceeding amount shown on Drawings of loose depth for material compacted by compaction equipment, and not more than the amount shown on Drawings in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each blended lift of planting soil to percentage of maximum Standard Proctor density according to ASTM D698 and tested in-place except where a different compaction value is indicated on Drawings.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.4 PLACING MANUFACTURED PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply manufactured soil on-site in its final, blended condition. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Subgrade Preparation: Till subgrade to a minimum depth as shown on Drawings. Remove stones, sticks, roots, rubbish, and other extraneous matter larger than any dimension as shown on Drawings. and legally dispose of them off Owner's property.

1. Apply approximately half the thickness of planting soil over prepared, loosened subgrade. Mix thoroughly into top of subgrade depths as shown in Drawings. Spread remainder of planting soil.

C. Application: Spread planting soil to total depth as shown on Drawings, but not less than required to meet finish grades after natural settlement. Do not spread if soil or subgrade is frozen, muddy, or excessively wet.

1. Lifts: Apply planting soil in lifts not exceeding dimensions shown in Drawings in loose depth for material compacted by compaction equipment, and not more than the dimension as shown in Drawings in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each lift of planting soil to percentage as shown on Drawings of maximum Standard Proctor density according to ASTM D698 except where a different compaction value is indicated on Drawings.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.5 BLENDING PLANTING SOIL IN PLACE

A. General: Mix amendments with in-place, unamended soil to produce required planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Preparation: Till unamended, existing soil in planting areas to a minimum depth shown on Drawings Remove stones, sticks, roots, rubbish, and other extraneous matter larger than any dimension shown in Drawings and legally dispose of them off Owner's property.

C. Mixing: Apply soil amendments, except compost, and fertilizer, if required, evenly on surface, and thoroughly blend them into full depth of unamended, in-place soil to produce planting soil.

1. Mix lime and sulfur with dry soil before mixing fertilizer.
2. Mix fertilizer with planting soil no more than seven days before planting.

D. Compaction: Compact blended planting soil to percent of maximum Standard Proctor density according to ASTM D698 except where a different compaction value is indicated on Drawings.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.6 APPLYING COMPOST TO SURFACE OF PLANTING SOIL

A. Application: Apply compost component of planting-soil mix as shown on Drawings of to surface of in-place planting soil. Do not apply materials or till if existing soil or subgrade is frozen, muddy, or excessively wet.

B. Finish Grading: Grade surface to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.7 LAYERED SOIL ASSEMBLIES

A. Layered Soil Assembly

1. Top Layer : Planting-soil type.
2. Planting-soil type

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Perform the following tests and inspections:

1. Compaction: Test planting-soil compaction after placing each lift and at completion using a densitometer or soil-compaction meter calibrated to a reference test value based on laboratory testing according to ASTM D698.

C. Soil will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Label each sample and test report with the date, location keyed to a site plan or other location system, visible conditions when and where sample was taken, and sampling depth.

3.9 PROTECTION

A. Protection Zone: Identify protection zones according to Section 015639 "Temporary Tree and Plant Protection."

B. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Vehicle traffic.
4. Foot traffic.
5. Erection of sheds or structures.
6. Impoundment of water.
7. Excavation or other digging unless otherwise indicated.

C. If planting soil or subgrade is over compacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Architect and replace contaminated planting soil with new planting soil.

3.10 CLEANING

A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.

1. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

END OF SECTION

SECTION 329300

PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Trees.
2. Mulches.
3. Tree stabilization.
4. Related materials.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.

D. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

E. Finish Grade: Elevation of finished surface of planting soil.

F. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

G. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

H. Planting Area: Areas to be planted.

I. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

J. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

K. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

L. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

M. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Anti-desiccant spray
2. Mycorrhizal inoculant.
3. Pesticides and herbicides
4. Steel edge and stakes.
5. Tree stabilization.

B. Samples for Verification: For each of the following:

1. Organic Mulch: 1-quart volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.

2. Edging Materials and Accessories: 6" sample section.

3. Tree Stabilization: 1 piece or unit.

C. Plant Material:

1. Location Data: Quantities and sizes of each plant material type, location of nursery, and location of growth (if different from nursery). Include address, phone number, and contact person for each nursery or other place of growth.

2. Photographs: At least 14 days prior to submittal of Plant Material Location Data, submit three color photographs in digital format of each required species and size of plant material as it will be furnished to the Project.

a. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph.

b. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished.

c. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Landscape Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

D. Handle planting stock by root ball or the container. Do not lift or handle container plants by the tops, stems, or trunks. Do not bend or bind/tie trees or shrubs in such a manner as to destroy their natural shape. Do not drop plants during delivery or handling.

E. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.

F. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

G. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation. Pad trunk and branches at all points of contact between plant material and equipment.

H. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
2. Do not remove container-grown stock from containers before time of planting.
3. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: March 15th through May 15th.
2. Fall Planting: October 15th through November 30th.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.

b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization.

2. Warranty Periods: From date of Substantial Completion.

a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
c. Delays in completion of planting operations which extend the planting into more than one planting season shall extend the Warranty Period accordingly.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

4. Incorrect Materials:

a. During Warranty Period, replace at no cost to the Owner, plants revealed as being untrue to name.
b. Provide replacements of a size and quality to match the planted materials at the time the mistake is discovered.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning.

1. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

2. Provide plants with healthy, well developed root systems, free of kinked, circling, girdling and center roots, root-bound conditions, and cracked or broken root balls.

3. Trunk and branches must be structurally strong and tree must be able to stand upright without stakes or guys on a windless day. Reject trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); with crossing trunks; or with cut-off limbs more than 3/4 inch in diameter.

4. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

5. Climatic Growing Conditions: Plant material shall be grown under climatic conditions similar to those of the project for at least two years unless otherwise accepted by the Landscape Architect.

6. Container Growth Limitations: Container stock, excluding annuals, shall have been grown in the containers in which plant material is delivered for at least six months, but not more than two years.

7. Do not prune, thin, or shape plants before delivery without approval of the Landscape Architect.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant. Plant nomenclature shall meet requirements o ICBN and ICNCP.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

2.2 MULCHES

A. Organic Mulch: Free of soil, rocks, toxic material, weed seeds, and other deleterious materials, and suitable as a top dressing of trees, shrubs, and plants. Mulch shall be of a

uniform grade with no additives or any other treatment. The pH shall range from 5.8 to 6.2.

1. Shredded hardwood mulch.
   a. Aged, double shredded.
   b. Color: Natural.

2. Composted Leaf Mulch

2.3 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or equivalent.
3. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch in diameter.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings.

1. Stake locations of trees where indicated on drawings. Drive a 3-foot long wood lath stake at each tree location and mark each tree type with a different color survey tape.

2. Lay out container grown shrubs and perennials as indicated on the drawings. Do not remove container grown shrubs from containers until time of planting.

3. Lay out a sample of ground cover spacing for review.

4. Contact the Landscape Architect to review locations prior to excavation of the plant pits. Adjust the locations in the field as directed by the Landscape Architect.

5. Do not excavate plant pits until the Landscape Architect has accepted the locations.

3.3 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to Section 312000 “Earth Moving”.

B. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed

base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.

2. Excavate plant pits to a diameter which is three times as wide as root ball diameter for trees and shrubs.
3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
5. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
6. Maintain supervision of excavations during working hours.
7. Keep excavations covered or otherwise protected after working hours and when unattended by Installer's personnel.

B. Backfill Soil: Plant soil mix.

C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch-diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting Soil mix as specified.

2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.

    a. Quantity: Fertilization as recommended by soil testing reports.

5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Balled and Potted and Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting Soil mix as specified.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before
4. placing remainder of backfill. Repeat watering until no more water is absorbed.
5. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.

    a. Quantity: Fertilization as recommended by soil testing reports.

6. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 MECHANIZED TREE-SPADE PLANTING

A. Trees may be planted with an approved mechanized tree spade at the designated locations. Do not use tree spade to move trees larger than the maximum size allowed for a similar field-grown, balled-and-burlapped root-ball diameter according to ANSI Z60.1, or larger than manufacturer's maximum size recommendation for the tree spade being used, whichever is smaller.

B. Use the same tree spade to excavate the planting hole as will be used to extract and transport the tree.

C. When extracting the tree, center the trunk within the tree spade and move tree with a solid ball of earth.

D. Cut exposed roots cleanly during transplanting operations.

E. Where possible, orient the tree in the same direction as in its original location.

3.7 TREE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Landscape Architect.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices, in accordance with the ANSI A300 Part I (Pruning) Standards from the Tree Care Industry Association. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.8 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying: Stake trees over 2” caliper. Stake trees of less than 2-inch caliper as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least 72 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.

2. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3. Do not install root barrier surrounding the root ball of tree.

3.9 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on Drawings in even rows with triangular spacing.

B. Backfill: Planting Soil mix as specified.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with 36-inch radius around trunks or stems. Do not place mulch within 3 inches trunks or stems.
2. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.11 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.12 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.13 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations at no cost to the Owner, in a manner approved by Landscape Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Landscape Architect.

B. Remove and replace trees that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern, at no cost to the Owner.

1. Provide new trees of same size as those being replaced.
2. Species of Replacement Trees: Same species being replaced.

C. Plant Warranty will apply to replaced plant materials.

3.14 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

END OF SECTION

SECTION 329600

TRANSPLANTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes transplanting non-nursery-grown trees as shown on drawings.

B. Related Requirements:

1. Section 015639 "Temporary Tree and Plant Protection" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
2. Section 329300 "Plants" for new trees from nursery-grown sources.

1.3 DEFINITIONS

A. General: See definitions in ANSI A300 (Part 6) and in ANSI Z60.1 pertaining to field-grown trees, except as otherwise defined in this Section.

B. Caliper (DBH): Diameter breast height; diameter of a trunk as measured by a diameter tape at a height 54 inches (1372 mm) above the ground line.

C. Root-Ball Depth: Measured from bottom of trunk flare to the bottom of root ball.

D. Root-Ball Width: Measured horizontally across the root ball with an approximately circular form or the least dimension for non-round root balls, not necessarily centered on the tree trunk, but within tolerance according to ANSI Z60.1.

E. Root Flare: Also called "trunk flare." The area at the base of the tree's stem or trunk where the stem or trunk broadens to form roots, the area of transition between the root system and the stem or trunk.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site.

1. Review methods and procedures related to transplanting work include, but are not limited to, the following:

a. Construction schedule. Verify availability of materials, personnel, equipment, and unimpeded access needed to make progress and avoid delays.
b. Tree and plant protection.
c. Tree maintenance.
d. Arborist's responsibilities.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each of the following:

1. Weed-control barriers.
2. Proprietary Root-Ball-Stabilization Device: One unit.
3. Slow-Release Watering Device: One unit of each size required.

C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1. Species and size of tree.
2. Location on site plan. Include unique identifier for each.
3. Reason for pruning.
4. Description of pruning to be performed.
5. Description of maintenance following pruning.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified tree-service firm and Arborist.

B. Certification: From Arborist, certifying that transplanted trees have been protected during construction and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Recommendations: From Arborist, recommended procedures to be established by Owner for care and protection of trees after completing the Work.

1. Submit before completing the Work.

D. Existing Conditions: Documentation of existing trees indicated to be transplanted, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed color photographs or video recordings. Color shall accurately depict hue condition of foliage and bark.
2. Include drawings and notations to indicate specific wounds and damage conditions of each tree designated to be transplanted.

E. Tree-Transplanting Program: Submit before work begins.

F. Sample Warranties: For special warranties.

G. Tree-maintenance reports.

1.7 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA, Certified Arborist-Municipal Specialist as certified by ISA, Licensed Arborist in jurisdiction where Project is located, Current member of ASCA or Registered Consulting Arborist as designated by ASCA.

B. Tree-Service Firm Qualifications: An experienced landscaping contractor or tree-moving firm that has successfully completed transplanting work similar to that required for this Project and that will assign an experienced, qualified Arborist to Project site during execution of the Work.

C. Tree-Transplanting Program: Prepare a written plan by Arborist for transplanting trees for the whole Project, including each phase or process, tree maintenance, and protection of surrounding materials during operations. Describe in detail the materials, methods, and equipment to be used for each phase of the transplanting work.

1. Include transplanting times appropriate for each species at the Project location unless otherwise indicated on drawings or directed by Arborist.
2. Include a transplanting schedule for each species to be transplanted, coordinated with the Project schedule.
3. Include site plans clearly marked to show tree-moving routes from extraction to planting locations. Indicate proposed equipment, weight, and turning radii.
4. Show details of temporary protective barriers where needed.
5. Include diagrams showing clearances to utility lines and other encumbrances along route.
6. Include care and maintenance provisions and eventual removal of tree stabilization.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways, and pavements, or on existing turf areas or trees.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery with appropriate certificates.

C. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees in such a manner as to destroy their natural shape.

D. Completely cover foliage when transporting trees while they are in foliage.

E. Handle trees by root ball. Do not drop trees.

F. Move trees after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after moving, set trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1.9 FIELD CONDITIONS

A. Field Measurements: Verify final grade elevations and final locations of trees and construction contiguous with trees by field measurements before proceeding with transplanting work. Perform transplanting only after finish grades are established.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: March 15th through May 15th.

2. Fall Planting: October 15th through November 30th.

C. Weather Limitations: Proceed with transplanting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Do not transplant during excessively wet or frozen conditions. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

D. Coordination with Turf Areas (Lawns): Perform transplanting before planting turf areas unless otherwise indicated.

1. When transplanting after planting turf areas, protect turf areas, and promptly repair damage caused by transplanting operations.

E. Coordination with Planting Beds: Perform transplanting before planting bedded areas unless otherwise indicated.

1. When transplanting after planting bedded areas, protect bedding plants, and promptly repair damage caused by transplanting operations.

1.10 WARRANTY

A. Installer's Special Warranty: Tree-service firm agrees to repair or replace trees and related materials that fail within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
b. Death and unsatisfactory growth is defined as more than 25 percent dead or in an unhealthy condition or failure to meet general performance requirements at end of warranty period.
c. Structural failures including trees falling or blowing over.
d. Faulty performance of materials and devices related to tree plantings including tree stabilization and watering devices.

2. Warranty Periods: From date of Substantial Completion.

    a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.

3. Include the following remedial actions as a minimum:

    a. Remove dead trees and trees with unsatisfactory growth at end of warranty period; replace when directed.
    b. A limit of one replacement of each tree will be required except for losses or replacements due to failure to comply with requirements.
    c. Replace materials and devices related to tree plantings.
    d. Provide extended warranty for period equal to original warranty period, for replaced trees.

1.11 MAINTENANCE SERVICE

A. Initial Maintenance Service: Provide tree maintenance by skilled employees of tree-service firm and as required in Part 3. Begin maintenance immediately after preparatory pruning or trees are installed and continue until plantings are healthy and well established but for not less than maintenance period below.

1. Maintenance Period: 12 months from date of Substantial Completion.

B. Continuing Maintenance Proposal: From tree-service firm to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Transplanted trees shall be healthy and resume vigorous growth within contract period as recommended by Arborist without dieback due to defective extracting, handling, planting, maintenance, or other defects in the Work.

2.2 PLANTING MATERIALS

A. Backfill Soil: Excavated soil, excavated soil mixed with planting soil, and Planting soil of suitable moisture content and granular texture for placing and compacting in planting pit around tree, and free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

1. Mixture: Well-blended mix in conformance with the drawings.
2. Planting Soil: Planting soil as specified in Section 329113 "Soil Preparation."

2.3 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
2. Wood Deadmen: Timbers measuring 8 inches (200 mm) in diameter and 48 inches (1200 mm) long, treated with specified wood preservative treatment by pressure process.
3. Flexible Ties: Wide rubber or elastic bands or straps.
4. Guys and Tie Wires: ASTM A641/A641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch (2.7 mm) in diameter.
5. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
6. Guy Cable: Five-strand, 3/16-inch- (4.8-mm-) diameter, galvanized-steel cable, fitted with zinc-coated 3/8-inch (10-mm) galvanized eyebolts at ends.
7. Flags: Standard surveyor's plastic flagging tape, white, 6 inches (150 mm) long.
8. Proprietary Staking-and-Guying Devices: Proprietary stake and adjustable tie systems to secure each new planting by tree stem; sized as indicated and according to manufacturer's written instructions.

B. Root-Ball-Stabilization Materials:

1. Upright Stakes and Horizontal Hold-Down: Rough-sawn, sound, new hardwood, or softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated; stakes pointed at one end.
2. Wood Screws: Hot dip galvanized or stainless steel.
3. Proprietary Root-Ball-Stabilization Devices: Proprietary at- or below-grade stabilization systems to secure each new planting by root ball; sized according to manufacturer's written instructions unless otherwise indicated.

C. Palm Bracing: Battens or blocks, struts, straps, and protective padding as indicated.

1. Battens or Blocks and Struts: Rough-sawn, sound, new hardwood, or softwood, free of knots, holes, cross grain, and other defects, 2-by-4-inch nominal (38-by-89-mm actual)by lengths indicated.
2. Straps: Adjustable steel or plastic package banding straps.
3. Padding: Burlap.
4. Proprietary Palm-Bracing Devices: Proprietary systems to secure each new planting by trunk; sized according to manufacturer's written instructions unless otherwise indicated.

2.4 WATERING DEVICES

A. Watering Pipe: PVC pipe 4 inches (100 mm) in diameter, site-cut to length as required, and with snug-fitting removable cap.

B. Slow-Release Watering Device: Standard product manufactured for drip-irrigation of plants and emptying its water contents over a period as described in drawings; manufactured from UV-light stabilized nylon-reinforced polyethylene sheet, PVC, or HDPE plastic.

2.5 MISCELLANEOUS PRODUCTS

A. Organic Mulch: as specified in Section 329300 "Plants."

B. Mineral Mulch: as specified in Section 329300 "Plants."

C. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

D. Burlap: Non-synthetic, biodegradable.

E. Pesticides: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended in writing by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

1. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
2. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

F. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

G. Weed-Control Barriers:

1. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101 g/sq. m) minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.
2. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd. (162 g/sq. m).

H. Wood Preservative Treatment by Pressure Process: AWPA U1; Use Category UC4a, using preservative chemicals acceptable to authorities having jurisdiction and containing no arsenic or chromium.

PART 3 - EXECUTION

3.1 TREE-TRANSPLANTING SPECIALIST

A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified Arborist to Project site during execution of the Work

3.2 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross transplanting areas.

B. For the record, prepare written report, endorsed by Arborist, listing conditions detrimental to transplanting work and tree protection and health.

C. Proceed with transplanting only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, other facilities, turf areas, and other plants and planting areas from damage caused by transplanting operations.

B. Utility Locator Service: Notify utility locator service and Pennsylvania One Call for area where Project is located before site clearing. Contractor to be responsible to have all utilities marked by utility locator before site clearing. Utility mark-outs to remain visible throughout construction.

C. Locate and clearly identify trees for transplanting with a 1-inch (25-mm) blue-vinyl tape around each tree at 54 inches (1372 mm) above the ground unless otherwise indicated.

D. Lay out individual transplant locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before transplanting. Make minor adjustments as required.

E. Apply antidesiccant to trees uniformly, using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during extracting, handling, and transportation.

1. If deciduous trees are moved in full leaf, spray with antidesiccant before extracting and again two weeks after transplanting.

F. Wrap trees with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during extracting, handling, and transporting.

3.4 PREPARATORY PRUNING

A. Root Pruning: Perform preparatory root pruning under direction of Arborist as far in advance of extracting each tree as the Project Schedule allows.

1. Dig exploratory pits or trench by hand or with an air spade around perimeter of tree at indicated root-ball width to determine locations of main lateral roots.
2. Dig trench by hand or with tree spade around perimeter of tree at indicated root-ball width to the depth of the root system. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
3. Root-Ball Width: Minimum 9 inches (229 mm) of root-ball diameter, or least dimension for non-round root balls, for each inch (25 mm) of tree caliper being transplanted.

4. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking.
5. Use narrow tine spading forks to comb soil to expose roots with minimal damage to root system.
6. Cut exposed roots manually with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
7. Do not paint or apply sealants on cut root ends.
8. Backfill trench with excavated soil.

B. Crown Pruning (Tip Pruning):

1. Do not perform preparatory crown pruning (tip pruning).
2. Perform preparatory crown pruning as shown on drawings, unless otherwise directed by Arborist. Follow procedures as specified in "Crown Pruning" Article.

3.5 EXCAVATION AND PLANTING EQUIPMENT

A. Tree Spade: Track-mounted mechanized tree mover; sized according to manufacturer's size recommendation for each tree being transplanted.

3.6 EXCAVATING PLANTING PITS

A. General: Excavate under supervision of the Arborist.

1. Excavate planting pits or trenches with sides sloping. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate approximately three times as wide as root ball.
3. Keep excavations covered or otherwise protected until replanting trees.

B. Subsoil and topsoil removed from excavations may be used as planting soil as indicated in drawings.

C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees are encountered in excavations.

1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes, 24 inches (600 mm) apart, into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.

D. Seepage: Notify Architect if subsoil conditions evidence unexpected water seepage into tree-planting pits.

E. Drainage: Fill planting pit or trench with 6 inches (152 mm) of water and time the infiltration rate of the soil. If the drainage rate is less than 0.25 inch (6 mm) per hour, notify Architect to determine need for subsurface drainage.

F. Saline or Sodic Soils: Completely fill excavations with water and allow to percolate away before positioning trees.

3.7 EXTRACTING TREES

A. General: Extract trees under supervision of the Arborist.

B. Orientation Marking: Mark the north side of each tree with non-permanent paint before extracting.

C. Root-Ball Width: Minimum 10 inches (250 mm) of root-ball diameter, or least dimension for non-round root balls, for each inch (25 mm) of tree caliper being transplanted.

1. Out-of-Season Planting: If planting before or after the in-season period for tree, provide a minimum root-ball diameter of 12 inches (305 mm) for each inch (25 mm) of tree caliper being transplanted.

D. Root-Ball Depth: As determined by the Arborist for each species and size of tree and for site conditions at original and planting locations.

E. Digging:

1. Dig and clear a pit by hand, or with tree spade to the depth of the root system. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Use narrow tine spading forks to comb soil to expose roots with minimal damage to root system.
3. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking.
4. Cut exposed roots manually with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not paint or apply sealants on cut root ends.
5. Construct box tight against root system sides and bottom as pit is dug. Brace and support box to prevent breaking of root ball.
6. Temporarily support and protect exposed roots from damage until they are permanently redirected and covered with soil. Cover roots with burlap and keep them moist until planted.

F. Extracting with Tree Spade: Use the same tree spade to extract the tree as will be used to transport and plant the tree.

1. Do not use tree spade to move trees larger than the manufacturer's maximum size recommendation for the tree spade being used.
2. When extracting the tree, center the trunk within the tree spade and move tree with a solid ball of earth.

3.8 PLANTING

A. Planting Standard: Perform planting according to ANSI A300 (Part 6) unless otherwise indicated.

B. Before planting, verify that root flare is visible at top of root ball. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

C. Ensure that root flare is visible after planting.

D. Remove injured roots by cutting cleanly; do not break. Do not paint or apply sealants on cut root ends.

E. Orientation: Position the tree so that its north side, marked before extracting, is facing north in its new location.

F. Set tree plumb and in center of planting pit with root flare 1 inch (25 mm) above adjacent finish grades.

1. Use specified backfill soil for backfill.
2. If area under the tree was initially dug too deep, add backfill to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
3. After placing some backfill around root ball to stabilize plant, begin backfilling.
4. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
5. Redirect exposed root ends downward in backfill areas where possible. Hand-expose roots as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches (75 mm) back from new construction and as required for root pruning.
6. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended by Arborist. Place tablets beside the root ball about 1 inch (25 mm) from root tips; do not place tablets in bottom of the hole.
7. Continue backfilling process. Water again after placing and tamping final layer of soil.

G. Watering Pipe: During backfilling, install watering pipe 4 feet (1220 mm) deep into the planting pit outside the root ball as indicated on drawings, and with top of pipe 1 inch (25 mm) above the mulched surface unless otherwise indicated.

H. Planting with Tree Spade: Use the same tree spade for planting as was used to extract and transport the tree. Do not use tree spade for trees larger than the manufacturer's maximum size recommendation for the tree spade being used.

I. Slopes: When planting on slopes, set the tree so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.9 CROWN PRUNING

A. Prune branches as shown on drawings, unless otherwise directed by Arborist.

1. Prune to remove only injured, broken, dying, or dead branches. Do not prune for shape.

2. Do not remove or reduce living branches to compensate for root loss caused by cutting root system or to improve natural tree form.
3. Pruning Standards: Perform pruning according to ANSI A300 (Part 1).

B. Unless otherwise directed by Arborist and acceptable to Architect, do not cut tree leaders.

C. Cut branches with sharp pruning instruments; do not break or chop.

D. Do not paint or apply sealants to wounds.

E. Provide subsequent maintenance during Contract period as recommended by Arborist.

F. Chip removed branches and spread over areas identified in drawings unless otherwise indicated.

3.10 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated on drawings or directed by Arborist.
1. Upright Staking and Tying: Stake trees over 2" caliper. Stake trees of less than 2-inch caliper as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend at least 72 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses
2. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
3. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

B. Trunk Stabilization by Staking and Guying: Install trunk stabilization as follows unless otherwise indicated on drawings or as directed by Arborist.

1. Site-Fabricated Staking-and-Guying Method: Install no fewer than three guys spaced equally around tree.

    a. Securely attach guys to stakes 30 inches (760 mm) long, driven to grade. Adjust spacing to avoid penetrating root balls or root masses. Provide turnbuckle or compression spring for each guy wire and tighten securely.
    b. For trees more than 6 inches (150 mm) in caliper, anchor guys to wood deadmen buried at least 36 inches (900 mm) below grade. Provide turnbuckle or compression spring for each guy wire and tighten securely unless otherwise indicated on drawings or directed by Arborist.
    c. Support trees with bands of flexible ties at contact points with tree trunk and reaching to a turnbuckle or compression spring unless otherwise indicated on drawings or directed by Arborist. Allow enough slack to avoid rigid restraint of tree.
    d. Support trees with guy cable or multiple strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points unless otherwise indicated on drawings or directed by Arborist.
    e. Attach flags to each guy wire as shown in drawings..

f. Paint turnbuckles or compression springs with luminescent white paint, unless otherwise indicated on drawings or directed by Arborist.

2. Proprietary Staking and Guying Device: Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

C. Root-Ball Stabilization: Install at- or below-grade stabilization system to secure each new planting by the root ball unless otherwise indicated on Drawings or directed by Arborist.

1. Wood Hold-Down Method: Place vertical stakes against side of root ball and drive them into subsoil; place horizontal wood hold-down stake across top of root ball and screw at each end to one of the vertical stakes.

a. Install stakes of length required to penetrate at least to the dimension shown on drawings, 18 inches (450 mm) below bottom of backfilled excavation. Saw stakes off at horizontal stake unless otherwise indicated.
b. Install screws through horizontal hold-down and penetrating at least 1 inch (25 mm) into stakes. Predrill holes if necessary to prevent splitting wood.
c. Install second set of stakes on other side of root trunk for larger trees as indicated.

2. Proprietary Root-Ball-Stabilization Device: Install root-ball-stabilization system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

D. Palm Bracing: Install bracing system at three or more places equally spaced around perimeter of trunk to secure each palm until established unless otherwise indicated.

1. Site-Fabricated Palm-Bracing Method:

a. Place battens over padding and secure battens in place around trunk perimeter with at least two straps, tightened to prevent displacement. Ensure that straps do not contact trunk.
b. Place diagonal braces and cut to length. Secure upper ends of diagonal braces with galvanized nails into battens or into nail-attached blocks on battens. Do not drive nails, screws, or other securing devices into palm trunk; do not penetrate palm trunk in any fashion. Secure lower ends of diagonal braces with stakes driven into ground to prevent outward slippage of braces.

2. Proprietary Palm-Bracing Device: Install palm-bracing system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.11 MULCHING

A. Install weed-control barriers before mulching as shown in drawings unless otherwise indicated and according to manufacturer's written instructions.

B. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.12 INSTALLING SLOW-RELEASE WATERING DEVICE

A. Provide one device for each tree.

B. Place device on top of the mulch at base of tree and fill with water according to manufacturer's written instructions.

3.13 TREE MAINTENANCE

A. Perform tree maintenance as recommended by Arborist. Maintain Arborist observation of transplanting work.

B. Maintain trees by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting, and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Treat as required to keep trees free of insects and disease.

C. From time of preparatory root pruning or tree extraction measure soil moisture adjacent to edge of each root ball as indicated in drawings. Record findings and weather conditions.

D. Fill areas of soil subsidence with backfill soil. Replenish mulch materials damaged or lost in areas of subsidence.

E. Apply treatments as required to keep tree materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

F. Pesticide Application: Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written instructions. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

1. Pre-Emergent Herbicides (Selective and Non-Selective): Apply in accordance with manufacturer's written instructions. Do not apply to seeded areas.
2. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written instructions.

G. Reports: Have Arborist prepare monthly inspection reports.

3.14 REPAIR AND REPLACEMENT

A. General: Repair or replace transplanted trees and other plants indicated to remain or be relocated that are damaged by construction operations, in a manner recommended by the Arborist and approved by Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to Arborist's written instructions.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Trees: Remove and replace trees indicated to remain that are more than 66 percent dead or in an unhealthy condition than the percentage indicated in Drawing’s before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Small Trees: Provide new trees of same size and species as those being replaced for as indicated in drawings.

2. Large Trees: Provide new tree(s) for each tree being replaced as indicated in drawings.

a. Species: As selected by Architect.

C. 3. Plant and maintain new trees as specified in Section 329300 "Plants."

3.15 CLEANUP AND PROTECTION

A. During transplanting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect trees from damage due to transplanting operations and operations of other contractors and trades. Maintain protection during transplanting and maintenance periods. Treat, repair, or replace damaged plantings.

C. After planting and before Substantial Completion, remove tags, markings, tie tape, labels, wire, burlap, and other debris from transplanted trees, planting areas, and Project site.

3.16 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Except for materials indicated to be recycled, remove surplus soil, excess excavated material, waste materials, displaced plants, trash, and debris, and legally dispose of them off Owner's property.

B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Except for materials indicated to be retained on Owner's property or recycled, remove excess excavated material, waste materials, displaced plants, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 329600

SECTION 330500

COMMON WORK RESULTS FOR UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Piping joining materials.
2. Transition fittings.
3. Grout.
4. Piped utility demolition.
5. Piping system common requirements.
6. Equipment installation common requirements.

1.3 DEFINITIONS

A. Exposed Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions.

B. Concealed Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

C. ABS: Acrylonitrile-butadiene-styrene plastic.

D. CPVC: Chlorinated polyvinyl chloride plastic.

E. PE: Polyethylene plastic.

F. PVC: Polyvinyl chloride plastic.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.5 COORDINATION

A. Coordinate size and location of concrete bases. Formwork, reinforcement, and concrete requirements are specified in Division 03.

PART 2 - PRODUCTS

2.1 PIPING JOINING MATERIALS

A. Welding Filler Metals: Comply with AWS D10.12/D10.12M for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

B. Solvent Cements for Joining Plastic Piping:

1. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

2.2 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post hardening, volume adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi, 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 PIPED UTILITY DEMOLITION

A. Disconnect, demolish, and remove piped utility systems, equipment, and components indicated to be removed.

1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

B. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING INSTALLATION

A. Install piping according to the following requirements and Division 33 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on the Coordination Drawings.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping to permit valve servicing.

E. Install piping at indicated slopes.

F. Install piping free of sags and bends.

G. Install fittings for changes in direction and branch connections.

H. Select system components with pressure rating equal to or greater than system operating pressure.

I. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.

3.3 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 33 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.4 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:

1. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

2. Install connections to existing utilities, per the utility companies requirements and specifications.

3.5 EQUIPMENT INSTALLATION

A. Install equipment level and plumb, unless otherwise indicated.

B. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference with other installations. Extend grease fittings to an accessible location.

C. Install equipment to allow right of way to piping systems installed at required slope.

3.6 GROUTING

A. Clean surfaces that will meet grout.

B. Provide forms as required for placement of grout.

C. Avoid air entrapment during placement of grout.

D. Cure placed grout.

END OF SECTION