

SPECIFICATIONS

RESTORATION UPGRADES TO BUILDING ENVELOPE
135 WEST HANOVER STREET
TRENTON, MERCER COUNTY, N.J.

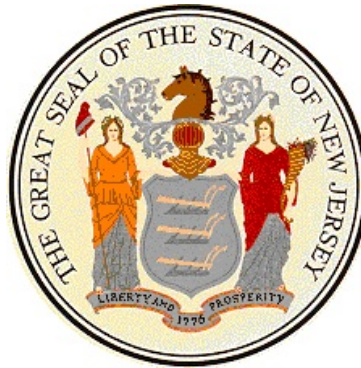
DPMC: A1310-00

STATE OF NEW JERSEY

Honorable Philip D. Murphy, Governor
Honorable Sheila Y. Oliver, Lieutenant Governor

DEPARTMENT OF THE TREASURY

Elizabeth Maher Muoio, State Treasurer



DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
Christopher Chianese, Director



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Environmental Engineers

March 16, 2020

FINAL DESIGN 4 SUBMISSION

**RESTORATION UPGRADES TO EXTERIOR BUILDING ENVELOPE
135 WEST HANOVER STREET
TRENTON, MERCER COUNTY, NJ
DPMC NO: A1310-00
L+G NO: 19504**

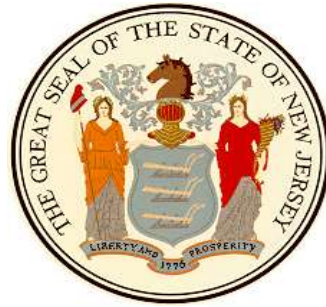
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STATE OF NEW JERSEY
DEPARTMENT OF THE TREASURY
DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION



REVISED
DECEMBER 2015

INSTRUCTIONS TO BIDDERS
AND
GENERAL CONDITIONS

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INSTRUCTIONS TO BIDDERS

IB 1 Bid Proposals

IB 1.1 Sealed proposals for the work described herein must be received and time-stamped in the Plan Room, Division of Property Management and Construction (DPMC), 9th Floor, 33 West State Street, P O Box 034, Trenton, NJ 08625-0034. The closing date and time for bids will be stated in the Advertisement for Bid. Bidders are cautioned that reliance on the US Postal Service or other mail delivery or courier service for timely delivery of proposals is at the bidders' risk. Failure by a bidder to have a sealed proposal reach DPMC by the prescribed time will result in rejection of the unopened submission.

IB 1.2 Bids may be accepted on the following branches of work, as applicable:

- a. Lump Sum All Trades
- b. General Construction
- c. Structural Steel
- d. Plumbing
- e. Heating, Ventilating and Air Conditioning
- f. Electrical
- g. Special Categories as may be required

IB 1.3 Contractors classified by DPMC may obtain contract documents at the DPMC address above, or upon written request, subject to payment of applicable fees. Each bidder is herewith put on notice that its general classification by DPMC is not the sole basis for qualification for the award of work. The Director reserves the right to deny award to any bidder that is not clearly responsible, based upon experience, past performance, financial capability or other material factors, to perform the work required herein.

IB 1.4 The schedule of non-refundable bid fees below is based upon individual trade construction cost estimates. Upon request and at no cost the DPMC will furnish a set of the contract documents for review in the offices of the division at the address noted in paragraph IB1.1 above.

DPMC BID DOCUMENTS FEE SCHEDULE (PER PACKAGE):

<u>TRADE ESTIMATE</u>	<u>DOCUMENT FEE</u>	<u>MAILING FEE</u>
\$100,000 or less	No charge	\$25.00
Greater than \$100,000	\$ 65.00	\$25.00

IB 1.5 Bid proposals based upon the plans, specifications, general, special and supplementary conditions and bulletins shall be deemed as having been made by the contractor with full knowledge of the conditions therein. Bidders are required to visit the site prior to submitting proposals for the work herein described, and to have thoroughly examined the conditions under which the contract is to be executed, including those reasonably observable conditions of the premises which would hinder, delay, or otherwise affect the performance of the contractor required under the terms of the contract. The State will not allow claims for additional costs as a result of the contractor's failure to become aware of the reasonably observable conditions affecting its required performance. The bidder is required to make appropriate allowances in the preparation of the bid for the

accommodation of such conditions. Bidders must warrant in the bid documents that the bidder is familiar with conditions existing at the site at the time the bid is submitted.

IB 1.6 Bid proposals shall be submitted on the standard form provided by DPMC, enclosed in a sealed envelope issued by DPMC. The name and address of the bidder must be indicated on the envelope, as well as indication of the DPMC project number, project location and other appropriate identification.

IB 1.7 All amounts in the bid documents shall be stated in numerical figures only.

IB 1.8 The bidder must include in the bid envelope: (1) the proposal signed by the bidder, (2) the executed affidavit of non-collusion, (3) the executed Source Disclosure Certification Form as further described in section IB1.11, (4) the executed Disclosure of Investment Activities in Iran Form and (5) bid security as further described in Section IB6.

IB 1.9 Proposals shall remain open for acceptance and may not be withdrawn for a period of 60 calendar days after the bid opening date.

IB 1.10 Proposals not submitted and filed in accordance with instructions contained herein and in the Advertisement for Bids may be rejected as non-responsive.

IB 1.11 Procurement Reform

- a. **RESTRICTIONS ON POLITICAL CONTRIBUTIONS** – In accordance with N.J.S.A. 19:44A-20.13, *et seq.*, bidders submitting a bid on or after October 15, 2004, shall be required to submit a Certification and Disclosure Form and Ownership Disclosure Form for all Business Entities. These forms must be submitted by the bidder and approved prior to contract award.

N.J.S.A. 19:44A-20.13, *et seq.*, prohibits State departments, agencies and authorities from entering into a contract that exceeds \$17,500 with an individual or entity that has made a contribution to that political party committee. N.J.S.A. 19:44A-20.13, *et seq.*, further requires the disclosure of all contribution to any political organization organized under section 527 of the Internal Revenue Code that also meets the definition of “continuing political committee” within the meaning of N.J.S.A. 19:44A-3(n) and N.J.A.C. 19:25-1.7. The successful bidder shall also be required to adhere to all continuing obligations contained in N.J.S.A. 19:44A-20.13, *et seq.*, regarding contributions and disclosures as required in N.J.S.A. 19:44A-20.13, *et seq.*

- b. **Source Disclosure Certification** - Pursuant to N.J.S.A. 52:34-13.2, *et seq.*, all bidders submitting a proposal shall be required to complete a Source Disclosure Certification that all services will be performed in the United States. The bidder shall disclose the location by country where services under the contract will be performed and any subcontracted services will be performed. The Source Disclosure Certification will be attached to the bid proposal.
- c. **MacBride Principles** - Pursuant to N.J.S.A. 52:34-12.2, a bidder must complete a certification on the DPMC form provided prior to contract award to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates pursuant to N.J.S.A. 52:34-12.2, that the bidder has no ongoing business activities in Northern Ireland and does not maintain a physical

presence therein through the operation of offices, plants, factories, or similar facilities, either directly or indirectly, through intermediaries, subsidiaries or affiliated companies over which it maintains effective control; or will take lawful steps in good faith to conduct any business operations it has in Northern Ireland in accordance with the MacBride principles of nondiscrimination in employment as set forth in N.J.S.A. 52:18A-89.8 and in conformance with the United Kingdom's Fair Employment (Northern Ireland) Act of 1989, and permit independent monitoring of their compliance with those principles. If a contractor who would otherwise be awarded a contract or agreement does not complete the certification, then the Director may determine, in accordance with applicable law and rules, it is in the best interest of the State to award the contract or agreement to the next responsible bidder who has completed the certification. If the Director finds the contractor to be in violation of the principles which are the subject of this law, s/he shall take such action as may be appropriate and provided for by law, rule or contract, including, but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the contractor in default and seeking debarment or suspension of the contractor.

- d. Investment Activities in Iran - Pursuant to N.J.S.A. 52, 32-55, *et seq.*, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete a certification with their bid on the DPMC form provided to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is found on the Division of Purchase and Property's website at www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Bidders must review this list prior to completing the certification. Failure to complete the certification may render a bidder's proposal non-responsive. If the Director finds a person or entity to be in violation of law, s/he shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

IB 2 Bid Modification

IB 2.1 A bidder may modify its bid proposal by electronic mail or letter at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the DPMC prior to such closing time. A mailed confirmation of any modification signed by the bidder must have been mailed and time-stamped by the US Postal Service prior to the specified closing time. Such confirmation, whether transmitted electronically or by mail, shall be accompanied by a newly executed affidavit of non-collusion.

IB 2.2 Communications shall not reveal the basic bid price but shall only provide the amount to be added, subtracted or modified so that the final prices or terms will not be revealed until the sealed proposal is opened. If written confirmation of the telegraphic modification is not received within two working days after the scheduled closing time, no consideration will be given to the telegraphic modification.

IB 2.3 Bids may be withdrawn upon receipt of a bidder's written request prior to the time fixed for the bid opening. A bidder's right to withdraw a bid is lost after a bid has been opened. If an error has been made in the bid amount, request for relief from the bid may be made in writing to the Director. The written request shall be signed by an authorized corporate officer. A determination of whether the bidder will be released shall be at the sole discretion of the Director, who shall issue a finding within five working days of receipt of all pertinent information relating to such request for relief.

IB 3 Consideration of Bids

IB 3.1 Award of Contracts or Rejection of Bids:

- a. Contracts will be awarded to the lowest responsible bidder. The awards will be made, or the bids rejected, within 60 calendar days from the date of the opening of bids. At the discretion of the Director, a bid extension may be requested from the bidders if circumstances warrant an extension.
- b. The Director reserves the right to award the contract on the basis of the single bid for the entire work, or on the basis of a separate bid and alternate, or any combination of separate bids and alternates, which the Director deems best serves the interest of the State.
- c. The Director reserves the right to waive any bid requirements when such waiver is in the best interests of the State, and where such waiver is permitted by law. Such waiver shall be at the sole discretion of the Director.
- d. The Director reserves the right to reject any and all bids when such rejection is in the best interests of the State. The Director also may reject the bid of any bidder which, in the Director's judgment, is not responsible or capable of performing the contract obligations based on financial capability, past performance, or experience. A bidder whose bid is so rejected may request a hearing before the Director by filing a written notice.

IB 3.2 The bidder to be awarded the contract shall execute and deliver the requisite contract documents, including payment and performance bonds, within the time specified. Upon the bidder's failure or refusal to comply in the manner and within the time specified, the Director may either award the contract to the next low responsible bidder or re-advertise for new proposals. In either case, the Director may hold the defaulting bidder and its surety liable for the difference between the applicable sums quoted by the defaulting bidder and the sum which the State may be obligated to pay to the contractor which is contracted to perform and complete the work of the defaulting bidder.

IB 4 Awards

IB 4.1 In executing a contract, the successful bidder agrees to perform the required work in a good and workmanlike manner to the reasonable satisfaction of the Director, and to complete all work within the number of calendar days specified in its contract.

IB 4.2 Successful bidders will be notified of the time and place for the signing of contracts. Key requirements in the contract, including, but not limited to, the number of days of performance of the contract, manner and schedule of payments, and other administrative details will be reviewed at the award meeting. The time and place of the first job meeting will be announced at the award meeting.

IB 4.3 The State reserves the right to award the contract upon the basis of a single bid for the entire work, or on the basis of separate bids for each prime trade when the total of the separate bids is less than the single bid. Alternates will be accepted or rejected in numerical sequence as cited in the bid documents and shall not be selected at random except as provided herein. Add alternates and deduct alternates will be specified separately. The State may choose from the add and deduct alternates without priority between the two groups so long as selection within each group is in numerical sequence from the first to the last. This limitation shall not apply, however, to any alternates concerning proprietary items. The Director, with the approval of the Using Agency, may accept alternates out of sequence, provided the Director states the reasons for so doing, in writing, within five working days following the opening of bids.

IB 4.4 Should submission of unit prices be required for specified items of work in bid proposals, they will be considered in the evaluation of bids as set forth in the bid proposal form.

IB 4.5 The successful bidder and all of its subcontractors are required to comply with the requirements of N.J.S.A. 10:5-31 et seq., regarding Equal Employment Opportunity in Public Works Contracts.

IB 5 Qualification of Bidders

IB 5.1 If the successful bidder is a corporation not organized under the laws of the State of New Jersey or is not authorized to do business in this State (foreign corporation), the award of the contract shall be conditioned upon the prompt filing by the said corporation of a certificate to do business in this State and complying with the laws of this State in that regard. This filing must be made with the Division of Revenue. No award of contract will be made until the Division of Revenue confirms this authorization.

IB 5.2 The State requires that each contractor, except in the case of a single contractor, shall perform a minimum of 35 percent of the contract work by the contractor's own forces. However, the Director has the sole discretion to reduce this percentage depending upon the nature and circumstances in any particular case, if the Director determines that to do so would be in the best interests of the State, and provided that the bidder submits a written request with the original bid proposal.

IB 5.3 The State reserves the right to reject a bidder at any time prior to the signing of a contract if information or data is obtained which, in the opinion of the Director, adversely affects the responsibility and/or the capability of the bidder to undertake and to complete the work, regardless of the bidder's previous qualification or classification. The State may

conduct any investigation as it deems necessary to determine the bidder's responsibility and capacity, and the bidder shall furnish all information and data for this purpose as requested by the State.

IB 5.4 Each bidder must be classified by DPMC in accordance with the provisions of the classification statute, N.J.S.A. 52:35-1, *et seq.*. In the case of a single bid for all of the work, the bidder shall include in the bid the names of its principal subcontractors (in categories as listed in IB1.2 above), which must also be classified in accordance with the said statute.

IB 5.5 At the time of the bid due date, the bidder and the subcontractors must be registered in accordance with “The Public Works Contractor Registration Act”, N.J.S.A. 34:11-56.48, *et seq.* All questions regarding registration shall be addressed to:

Contractor Registration Unit
New Jersey Department of Labor
Division of Wage & Hour Compliance
P O Box 389
Trenton NJ 08625-0389
Telephone: 609-292-9464
FAX: 609-633-8591

IB 5.6 In accordance with N.J.S.A. 52:32-44, *et seq.* Public Law 2001, Chapter 134, all contractors and subcontractors providing goods/services to State agencies and authorities are required to provide the contracting agency or authority with proof of registration with the Department of Treasury, Division of Revenue. The basic registration process involves the filing of Form NJ-Reg., which can be filed online at www.state.nj.us/njbgs/services.html or by calling (609) 292-7077 or (609) 292-1730.

IB 6 Deposit and Bid Bond

IB 6.1 The Proposal, when submitted, shall be accompanied by a Bid Bond satisfactory to the Director, for the sum of not less than fifty percent (50%) of the Total Bid including alternates, if applicable.

IB 6.2 The Bid Bond shall be properly filled out, signed, and witnessed.

IB 6.3 The Bid Bond shall be accompanied by a copy of the power of attorney executed by the surety company or companies. The power of attorney shall set forth the authority of the attorney-in-fact who has signed the bond on behalf of the surety company to bind the company and shall further certify that such power is in full force and effect as of the date of the bond.

IB 6.4 If the bidder whose proposal is accepted is unable to provide the performance and payment bonds or fails to execute a contract, then such bidder and the bid bond surety, where applicable, shall be obligated to pay to the State the difference between the amount of the bid and the amount which the State contracts to pay another party to perform the work. The bidder and the surety shall pay, upon demand, the entire amount of the State's difference in cost. Should there be a deficiency in excess of the bid deposit, the bidder shall make immediate payment to the State for any such deficiency. Nothing contained herein shall be construed as a waiver of any other legal remedies that the State may have against the contractor.

IB 6.5 Attorneys-in-fact who sign bid bonds or contract bonds must file a certified power-of-attorney with the State indicating the effective date of that power.

IB 7 Performance and Payment Bond

IB 7.1 The successful bidder shall furnish within ten (10) calendar days after notice of award both a performance bond in statutory form in an amount equal to one hundred percent (100%) of the total contract price as security for the faithful performance of this contract and a payment bond in statutory form in amount equal to one hundred percent (100%) of the contract price as security for the payment of all persons and firms performing labor and furnishing materials in connection with this contract. The performance bond and the payment bond may be combined or in separate instruments in accordance with law. If combined, they must be for 200% of the award amount. No contract shall be executed unless and until each bond is submitted to and approved by the State. The surety must be presently authorized to do business in the State of New Jersey. In addition to the other coverage provided, the Bond shall cover all Contract guarantees and any other guarantees/warranties issued by the Contractor.

IB 7.2 The cost of all performance and payment bonds shall be paid for by the successful bidder.

IB 7.3 If at any time the State, for justifiable cause, is dissatisfied with any surety which has issued or proposes to issue a performance or payment bond, the contractor shall, within ten calendar days after notice from the State to do so, substitute an acceptance bond (or bonds). The substituted bond(s) shall be in such form and sum and executed by such other surety or sureties as may be satisfactory to the State. The premiums on such bond(s) shall be paid by the contractor. No contract shall be executed and/or no payment made under a contract until the new surety or sureties shall have furnished such an acceptable bond to the State.

IB 7.4 Bonds must be legally effective as of the date the contract is signed. Each must indicate the contractor's name exactly as it appears on the contract. Current attorney-in-fact instruments and financial statement of the surety must be included with the bonds. Bonds must be executed by an authorized officer of the surety. Bonds furnished under this section shall conform in all respects to the requirement and language of NJSA 2A:44-143 to 147.

IB 8 Bulletins and Interpretations

IB 8.1 No interpretation of the meaning of the plans, specifications or other pre-bid documents will be provided to any bidder unless such interpretation is made in writing to all prospective bidders prior to the opening of bids. Any such interpretations must be identified in bid proposals submitted. Any interpretations which are not entered in accordance with this provision shall be unauthorized and not binding upon the State.

IB 8.2 Every request for an interpretation relating to clarification or correction of the plans, specifications, or other bid documents must be made in writing, addressed to the architect/engineer and the DPMC Director, and must be received at least five (5) working days prior to the date fixed for the opening of the bids. Any and all interpretations, clarifications or corrections and any supplemental instructions must be issued by the Director in the form of written bulletins and mailed by certified mail, return receipt requested, or by electronic notice to all prospective bidders not later than three (3) working days prior to the date of the opening of bids. All bulletins issued shall become part of the

contract documents and shall be acknowledged in all bid proposals. Failure of a bidder to acknowledge receipt of all such bulletins and interpretations by the time of bid opening shall result in its proposal being considered non-responsive, at the option of the Director.

IB 8.3 Each bidder shall be responsible for thoroughly reviewing the contract documents prior to the submission of bids. Bidders are advised that no claim for expenses incurred or damages sustained as a result of any error, discrepancy, omission, or conflict in the contract documents shall be recognized by the State unless, and only to the extent that, a written request for interpretation, clarification or correction has been submitted in compliance with Section IB8.2 and provided the matter has not been addressed by the State through the issuance of a bulletin interpreting, clarifying or correcting such error, discrepancy, omission or conflict.

IB 9 Assignments

IB 9.1 The contractor shall not assign all or any part of this contract without written consent of the State. Money due (or to become due) the contractor hereunder shall not be assigned for any purposes whatsoever.

IB 10 Federal Excise Taxes and State Sales Tax

IB 10.1 In general, bidders, in preparing bids, must take into consideration applicable Federal and State tax laws.

IB 10.2 Materials, supplies or services for exclusive use in erecting structures or buildings or otherwise improving, altering or repairing all State-owned property are exempt from the State sales tax. The successful bidder must submit Division of Taxation form ST13, Exempt Use Certificate, to the seller of all materials, supplies or services that will be incorporated into the Work.

IB 10.3 Bidders must determine the current status and applicability of any tax laws, and the contractor may make no claim based upon any error or misunderstanding as to the applicability of any tax laws.

IB 10.4 Purchases or rentals of equipment are not exempt from any tax under the State Sales Tax Act.

IB 11 Restrictive Specifications

IB 11.1 Should any bidder determine before the bid due date that any portion of the specifications or drawings specify a particular product which can be provided by only one supplier or manufacturer, with the result that competitive prices are not available, the bidder shall immediately notify the Director in writing of such fact.

IB 11.2 If such notice is not given in a timely manner, it shall be assumed that the bidder has included the estimate of such sole source in the bid. However, if the Director is notified in a timely manner of the sole source of supply or manufacture, the Director may order the product re-bid or take other lawful action. Such action shall be at the Director's sole discretion.

IB 12 Offer of Gratuities

IB 12.1 Bidders are advised that the laws of New Jersey (NJSA 52:34-19) make it a misdemeanor to offer, pay or give any fee, commission, compensation, gift or gratuity to any person employed by the State. Also, Executive Order #189 (1988) requires that all requests for proposals and contracts issued by the State specify prohibitions on vendor (contractor) activities, the violation of which shall render the vendor liable to ineligibility for State contracts, pursuant to the debarment procedures set forth in N.J.A.C. 17:19-4.1., *et seq.* These prohibited activities include the following:

- a. No vendor shall pay, offer to pay, or agree to pay, either directly or indirectly, any fee, commission, compensation, gift, gratuity, or other thing of value of any kind to any State officer or employee or special State officer or employee, as defined by NJSA 52:34D-13b. and e., in the Department of Treasury or any other agency with which such vendor transacts or offers or proposes to transact business, or to any member of the immediate family, as defined by NJSA 52:13D-13i., of any such officer or employee, or any partnership, firm, or corporation with which they are employed or associated, or in which such officer or employee has an interest within the meaning of NJSA 52:13D-13g.
- b. The solicitation of any fee, commission, compensation, gift, gratuity or other thing of value by any State officer or employee or special State officer or employee from any State vendor shall be reported in writing forthwith by the vendor to the Attorney General and the Executive Commission on Ethical Standards.
- c. No vendor may, directly or indirectly, undertake any private business, commercial or entrepreneurial relationship with, whether or not pursuant to employment, contract or other agreement, express or implied, or sell any interest in such vendor to, any State officer or employee or special State officer or employee having any duties or responsibilities in connection with the purchase, acquisition or sale of any property or services by or to any State agency or any instrumentality thereof, or with any person, firm or entity with which he is employed or associated or in which he has an interest within the meaning of NJSA 52:13D-13g. Any relationships subject to this provision shall be reported in writing forthwith to the Executive Commission on Ethical Standards, which may grant a waiver of this restriction upon application of the State offer or employee or special State officer or employee upon a finding that the present or proposed relationship does not present the potential, actuality or appearance of a conflict of interest.
- d. No vendor shall influence, or attempt to influence or cause to be influenced, any State officer or employee or special State officer or employee in his official capacity in any manner which might tend to impair the objectivity or independence of judgment of said officer or employee.
- e. No vendor shall cause or influence, or attempt to cause or influence, any State officer or employee or special State officer or employee to use, or attempt to use, his official position to secure unwarranted privileges or advantages for the vendor or any other person.

- f. The provisions cited above in paragraphs IB12.1.a. through e. shall not be construed to prohibit a State officer or employee or special State officer or employee from receiving gifts from or contracting with vendors under the same terms and conditions as are offered or made available to members of the general public subject to any guidelines the State Ethics Commission on Ethical Standards may promulgate under paragraph IB12.1.c. above.

END OF INSTRUCTIONS TO BIDDERS

GENERAL CONDITIONS

ARTICLE 1 - GENERAL PROVISIONS

1.1 DEFINITIONS:

1.1.1 Architect/Engineer: The Architect/Engineer (“A/E”) is the consultant engaged by the DPMC to prepare the design and perform certain contract administration functions in accordance with the provisions of its contract with the DPMC.

1.1.2 Bulletin: A document, issued by DPMC prior to the opening of bids, which supplements, revises or modifies the bid document(s).

1.1.3 Change in the Work: A change in the Project and the Contract Documents, including, but not limited to, an increase or decrease in the Work, an acceleration or extension of time for the performance of the Work.

1.1.4 Change Order: A written order, directing or authorizing a Change in the Work executed by the DPMC and agreed to by the Contractor (except in the case of unilateral change orders executed by DPMC) that includes all adjustments to work, compensation and/or time warranted by the Change in the Work.

1.1.5 Code Official: the individual licensed by the NJ Department of Community Affairs authorized to enforce the NJ Uniform Construction Code (UCC) and approve or reject the Work for NJ UCC compliance.

1.1.6 Construction Management Firm or “CMF”: A person or firm that may be engaged by the DPMC to assist DPMC in the administration of its contracts.

1.1.7 Contract: The entire and integrated agreement between the Contractor and the DPMC encompassing all of the Contract Documents.

1.1.8 Contract Documents: The executed form of Contract, General Conditions, Supplementary Conditions, Supplementary Instructions, Bulletins, plans, specifications, instructions to bidders, addenda, responses to requests for information, Price Proposal, Change Orders, other amendments, including construction change directives, and all exhibits, appendices and documents attached to or referenced in any of the foregoing materials.

1.1.9 Contract Limit Lines The lines shown on the Contract Drawings that define the boundaries of the Project, and beyond which no construction work or activities may be performed by the Contractor unless otherwise noted on the drawings or specifications.

1.1.10 Contractor: The business entity with whom the DPMC enters a contract for the performance of the construction of a construction Project by the terms set forth in the Contract Documents.

1.1.11 Contract Price: The sum stated in the Contract, as it may be adjusted in accordance with the Contract Documents, that represents the total amount payable by the DPMC to the Contractor for performance of the Work.

1.1.12 Day: A calendar day, unless otherwise designated.

1.1.13 Director: The person authorized by statute to administer the design, engineering and construction of all State buildings and facilities. The Director is the contracting officer representing the State personally or through authorized representatives in all relationships with Contractors, consultants and Architects/Engineers. This includes designees or an authorized administrative contracting officer acting within the limits of his or her authority. The Director or his or her duly authorized representative is the interpreter of the conditions of this contract and the judge of its performance.

1.1.14 Division of Property Management and Construction (DPMC): The State of New Jersey's contracting agency for the design and construction of State facilities.

1.1.15 Final Acceptance and Completion: The date following receipt and acceptance by DPMC of all administrative and close-out documents. Following acceptance, the DPMC will issue a Certificate of Final Acceptance and Completion for the Project.

1.1.16 Generally Accepted Accounting Principles: The common set of accounting principles, standards and procedures that companies use to compile their financial statements. Accounting records must identify all labor and material costs and expenses, whether they are direct or indirect. The identity must include at least the Project number for direct expenses and/or account number for indirect expenses.

1.1.17 NJUCC or Code: The New Jersey Uniform Construction Code which governs the permit and approval process for construction projects.

1.1.18 Notice: A written directive or communication given by DPMC to the Contractor to act or perform work or carry out some other contractual obligation, or a written communication to be served by the Contractor upon the State. A notice served on the Contractor will be deemed to have been duly served if delivered to an individual or member of the firm or entity or to an officer of the corporation for whom it was intended. This includes regular mail, e-mail, delivery by courier, or registered or certified mail, or facsimile to the Contractor's business address cited in the Contract documents. A notice from the Contractor to the State shall be deemed to have been duly served only if delivered to the Director or the Director's duly authorized representative.

1.1.19 Notice to Proceed: The written communication issued by the DPMC to the Contractor directing the Contractor to begin the Work. The contract calendar day duration period will commence on the effective date noted.

1.1.20 Project: The term for the entire public works engagement. It includes the design, construction work and all administrative aspects required to fully complete the engagement.

1.1.21 Punch List: The list of incomplete or defective Work, compiled by DPMC and/or its authorized representative, which remains to be completed after achievement of Substantial Completion.

1.1.22 Schedule: The time tracking mechanism that establishes the Project's allotted time requirements for completion as more specifically described in Article 6 of these General Conditions. When the construction activity items of the schedule have a monetary value associated with them, the schedule is referred to as a "costed" or "cost-loaded" schedule.

1.1.23 Site: The geographical location of the facility or property at which the Work under the Contract is to be performed.

1.1.24 State or Owner: The State of New Jersey, acting through DPMC.

1.1.25 Subcontractor: The business entity that enters into an agreement with the Contractor for the performance of work or materials under this Contract. Also refers to any agreement between a Subcontractor and any of lower tier Subcontractors. Such an agreement creates no relationship, legal or otherwise, between the DPMC and the Subcontractor(s) and/or lower tier Subcontractor(s).

1.1.26 Substantial Completion: The date when all essential requirements of the Contract Documents have been satisfied so that the purpose of the Contract Documents is accomplished, as determined by the DPMC including training of staff by the Contractor on all equipment, and resulting in the issuance of a temporary Certificate of Occupancy, a permanent Certificate of Occupancy or a permanent Certificate of Acceptance and when the Work and the facility can be safely occupied and used in accordance with its intended purpose. DPMC may condition issuance of a Certificate of Substantial Completion upon satisfactory receipt of critical documents.

1.1.27 Unit Schedule Breakdown: A detailed list of the Work activities required for Project construction, other elements associated with fulfilling the requirements of the Contract (bonds, insurance, etc.), major items of material, labor or equipment, and the prices associated with each of them.

1.2.28 Using Agency: The State department or agency for whom the construction project is being completed.

1.1.29 Work: All construction, supervision, labor, material and equipment necessary to complete the obligations under the Contract including Operation and Maintenance Manuals, Punch List completion, and As-Built Documents.

1.2 CONTRACT DOCUMENTS TO BE PROVIDED BY DPMC

Upon Contract award, the DPMC will furnish to the Contractor, free of charge, three copies of the drawings and specifications, and any additional instructions by means of supplemental contract documents as otherwise necessary for the proper execution of the Work, unless otherwise provided in the Contract Documents. Upon request, additional copies of the contract documents will be furnished at the Contractor's expense.

1.3 INTENT OF THE CONTRACT

1.3.1 The drawings, specifications and all of the Contract Documents are intended to require the Contractor to provide for everything necessary to accomplish the proper and complete finishing of all work. For the Project, the Contractor shall perform all of the obligations and work identified in the Contract Documents, regardless of the manner in which it is divided among the trades or the order in which it appears in the Contract Documents. All work and materials included in the specifications and not shown on the drawings, or shown on the drawings and not in the specifications shall be performed and/or furnished by the Contractor. The Contractor shall include any incidental materials

and/or Work not indicated in the drawings and/or the specifications which are nevertheless necessary for the development of the Project and are reasonably inferable from the contract documents and industry practice. The Contractor shall perform all such work and furnish all such materials as if particularly delineated or described in the contract documents as part of the bid proposal.

1.3.2 The Contractor acknowledges that in preparing its bid, the Contractor had the obligation to raise any reasonably observable errors, omissions, ambiguities or discrepancies and request an interpretation of the alleged errors, omissions, ambiguities or discrepancies. If the Contractor failed to do so, it will have waived all rights to a Change Order or claim and the Contractor will be responsible to complete the Work as required, consistent with the intent of the Contract Documents as interpreted by the DPMC, without additional compensation.

1.3.3 No interpretation of the meaning of the plans, specifications or other Contract Documents provided prior to bid submission shall be binding upon the State for any purpose unless issued in a Bulletin.

1.3.4 The Contractor shall abide by and comply with the intent and meaning of the Contract Documents taken as a whole, and shall not take advantage of any error or omission, should any exist. Should the Contractor become aware of the existence of any error, omission or discrepancy, the Contractor shall immediately notify the DPMC and the Architect/Engineer of any such errors, omissions, ambiguities or discrepancies and seek correction or interpretation thereof prior to commencement of the Work at issue. The Architect/Engineer shall issue a written interpretation. The Contractor shall do no work outside of the Contract Documents, unless written authorization to proceed from the DPMC is received by the Contractor.

1.3.5 Each and every provision required by law to be inserted in the Contract Documents is deemed to have been inserted therein. If any such provision has been omitted or has not been correctly inserted, then upon application of either party, the Contract may be modified to provide for such insertion or correction.

1.3.6 The order of precedence pertaining to interpretation of Contract Documents is as follows:

- a. Executed Contract
- b. Bulletins and Instructions
- c. Supplemental General Conditions
- d. Specifications and General Conditions
- e. Drawings, in the following order of precedence:
 - (1) Notes on drawings
 - (2) Large scale details
 - (3) Figured dimensions
 - (4) Scaled dimensions

1.3.7 Where there may be a conflict in the Contract Documents not resolvable by application of the provisions of this Article, then the more expensive labor, materials, or equipment shall be assumed to be required and shall be provided by the Contractor.

1.3.8 On all work, it shall be the responsibility of the Contractor, by personal inspection of the existing building, facility, plant or utility systems, to ascertain the accuracy of any information given. This shall be the case, whether or not such information is indicated on the drawings, included in the specifications, or shown in any other documentation that is available. The Contractor shall have an affirmative duty to make reasonable inquiry for all available information. The Contractor shall include the costs of all material and labor required to complete the Work based on inspection and reasonably observable conditions.

1.4 WORKDAYS

Regular working hours will be defined in the Contract Documents. Changes thereto may be granted with written approval of the DPMC representative. Any work required to be performed after regular working hours or on Saturdays, Sundays, or legal holidays as specially set forth in the Contract documents, as may be reasonably required and consistent with contractual obligations, shall be performed at the amount set forth in the Contractor's bid without additional expense to the State. The Contractor shall obtain written approval of the DPMC representative for performance of work after regular working hours or on non-regular workdays at least forty-eight (48) hours prior to the commencement of overtime, unless such overtime work is caused by an emergency. If the Contractor seeks such approval for the overtime work, same shall be performed at no additional cost to the DPMC except in the event of an emergency, at which time, the DPMC, in its sole discretion, shall determine if the submitted overtime is compensable.

1.5 ASSIGNMENTS

The Contractor shall not assign all or any part of this Contract without the written consent of the Director. Money due (or to become due) the Contractor hereunder shall not be assigned for any purpose whatsoever without the written consent of the Director.

1.6 STATE SALES TAX

1.6.1 Materials, supplies or services for exclusive use in the construction of structures or buildings or otherwise improving, altering or repairing all State-owned property are exempt from the State sales tax.

1.6.2 Purchases or rentals of equipment are not exempt from any tax under the State Sales Tax Act.

ARTICLE 2 - OWNER/DPMC

2.1 DPMC'S REPRESENTATION

The DPMC will be represented on the Project by DPMC's designated representative(s). DPMC's designated representative(s) have only those duties that are required of the Owner under this Contract.

2.2 RIGHT TO PERFORM WORK

The DPMC may, and reserves the right to, enter upon the premises at any and all times during the progress of the Work, or cause others to do so, for the purpose of performing any work or installing any apparatus or carrying on any construction not included in the Contract Documents, or for any other reasonable purpose.

The DPMC shall have the right to defer the beginning of Work or to suspend the whole or any part of the Work whenever, in the sole discretion of the DPMC, it may be necessary or expedient for the State to do so.

2.3 MEANS AND METHODS

The State will not be responsible for, nor have control or charge of construction means, methods, techniques, sequences of procedures, or safety precautions and programs in connection with the Work. The State will not be responsible for, nor have control or charge of, the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other person performing any of the Work.

ARTICLE 3 - ARCHITECT/ENGINEER

3.1 DUTIES AND RESPONSIBILITIES

3.1.1 The Architect/Engineer (“A/E”) is the consultant engaged by the DPMC to prepare the design and perform certain contract administration functions in accordance with the provisions of its contract with the DPMC.

3.2 PROGRESS MEETINGS

The Architect/Engineer will attend, chair and issue record minutes of bi-weekly job progress meetings.

3.3 SITE OBSERVATIONS

3.3.1 The Architect/Engineer will monitor the execution and progress of the Work. The Architect/Engineer will at all times be provided access to the Work. The Contractor shall provide facilities for such access so as to enable the Architect/Engineer to perform its functions.

3.3.2 The Architect/Engineer will not be responsible for, nor have control or charge of construction means, methods, techniques, sequences of procedures, or safety precautions and programs in connection with the Work. The Architect/Engineer will not be responsible for, nor have control or charge of, the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other person performing any of the Work.

3.4 SHOP DRAWINGS AND SUBMITTALS AND INVOICES

As more specifically described in Article 4, the Architect/Engineer will review, approve or take other appropriate action relating to Contractor’s submittals, including shop drawings, product data and samples, and as – built drawings, to assure conformance with the requirements of the Contract. Such actions shall be taken with reasonable promptness. Approval of a specific item shall not indicate approval of an assembly of which the item is a component.

3.5 PAYMENT APPROVALS

3.5.1 The Architect/Engineer is responsible for the timely review of all invoices submitted by the Contractor. The Architect/Engineer shall inform the Contractor of any deficiencies therein. When the payment voucher is deemed accurate, the Architect/Engineer shall recommend approval of Contractor invoices.

3.5.2 The Architect/Engineer will review and recommend approval of Contractor closeout documentation in conjunction with the final application for payment.

ARTICLE 4 - THE CONTRACTOR

4.1 REVIEW OF THE CONTRACT DOCUMENTS AND FIELD CONDITIONS

4.1.1 The Contractor has the duty to thoroughly examine and be familiar with all of the Contract Documents and the Project site. The Contractor shall investigate and accurately determine the nature and location of the Work, the current building equipment and systems, labor and material conditions, and all matters which may in any way affect the Work or its performance.

4.1.2 The Contractor shall be deemed to have verified all reasonably observable conditions outside the Contract limit lines to determine whether any conflict exists with the Work that the Contractor is required to perform under the Contract. This includes but is not limited to a check on elevations, utility connections and other site data. If a condition changed from the time of the bid to the time of the issuance of the Notice to Proceed, the Contractor shall notify the Architect/Engineer immediately. The Contractor shall immediately report any conflicts prior to the bid proposal due date or waive any claim for additional compensation arising from such conflict.

4.1.3 During the progress of the Work, the Contractor shall immediately report in writing any alleged error, inconsistency, ambiguity or omission in the Contract Documents to DPMC. The Contractor shall not continue with any work that is affected by such alleged error, inconsistency, ambiguity or omission until the DPMC has had the opportunity to respond. Any error, inconsistency, ambiguity or omission shall be addressed pursuant to appropriate procedures set forth in these General Conditions.

4.1.4 Following notification of an alleged error, inconsistency, ambiguity or omission, the DPMC may issue supplemental instructions for the proper execution of the Work. The Contractor shall do no work without proper supplemental instructions. In giving such supplemental instructions, the DPMC will have the right to direct the Contractor to make minor changes in the Work without payment of additional monies. This provision is not intended to infringe upon or limit the DPMC's authority to otherwise direct changes in the Work, described elsewhere in these general conditions.

4.1.5 Where certain work is shown in complete detail, but not repeated in similar detail in other areas of the drawings, or if there is an indication of continuation with the remainder being shown only in outlines, the Work shown in detail shall be understood to be required in other like portions of the Project.

4.1.6 Unless otherwise directed in writing by the DPMC, the Contractor shall perform no portion of the Work without appropriate approvals as may be applicable and required by the Contract Documents.

4.1.7 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, equipment, materials, tools, construction equipment and machinery, water, heat, utilities, transportation and other facilities and services necessary for the proper execution, protection, and completion of the Work.

4.2 INSURANCE

The Contractor shall secure and maintain in force, for the term of the Contract, insurance coverage provided in Section 13.4. The Contractor shall provide the State of New Jersey with current certificates of insurance for all coverage and renewals thereof which must contain a provision that the insurance provided in the certificate shall not be canceled for any reason except after thirty (30) calendar day's written notice to the State of New Jersey. If cancellation occurs, the Contractor shall immediately procure new coverage, not allowing any lapse of coverage to occur.

4.3 PERMITS, LAWS, AND REGULATIONS

4.3.1 The DPMC shall obtain and pay for the construction permits and inspections (building, plumbing, electrical, elevator and fire), required by the Department of Community Affairs (DCA). When permits are issued by DCA, the appropriate licensed Contractors and/or Subcontractors shall be required to fill out the Contractor section of the Sub-Code Technical Section and sign and affix their raised seal thereto.

4.3.2 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for all other permits and governmental fees, licenses and inspections necessary for the proper execution and completion of the Work, and which are legally required at the time of receipt of bids.

4.3.3 All work must be done in accordance with the NJUCC. No work requiring inspections and approval by construction NJUCC code officials is to be covered or enclosed prior to inspection and approval by the appropriate NJUCC enforcement officials.

4.3.4 The Work performed pursuant to this Contract is exempt from local ordinances, codes and regulations as related to the building and the Site on which it is located, except in certain limited circumstances, where construction could adversely affect adjacent property, public sidewalks and/or streets. In those instances, the Contractor shall coordinate its activities with municipal and/or highway authorities having appropriate jurisdiction.

4.3.5 Immediately upon receipt of the contract award documents from the DPMC, the Contractor shall notify all utility companies involved regarding utility services required for completion of the Work. Such notification shall be in addition to any notification requirements imposed by law, including, without limitation, the Underground Facility Protection Act, N.J.S.A. 48:2-73, et seq.

4.3.6 The Contractor shall perform all soil conservation measures in accordance with County Soil Conservation District requirements.

4.3.7 The Contractor shall perform all sewage disposal work in conformance with the regulations of the State's Department of Environmental Protection.

4.3.8 The Contractor shall be responsible for obtaining timely NJUCC inspections of the Work from the applicable State agency. The Contractor shall request such

inspections through DPMC authorized representatives allowing for sufficient notice to enable NJUCC inspections to be scheduled without delay to the Work.

4.3.9 Consistent with section 4.4 of these General Conditions, the Contractor shall be responsible for its own actions and protect, defend and indemnify the State from all fines, penalties or loss incurred for, or by reason of, the violation of any municipal ordinance or regulation or law of the State while the said work is in progress.

4.3.10 The Contractor shall comply with the Federal Occupational Safety and Health Act of 1970 and all of the rules and regulations promulgated there under.

4.3.11 If the Contractor causes a substantial violation of a State, local or federal statute or regulation on the Project, DPMC may declare the Contractor to be in default, and/or terminate the Contract.

4.3.12 Prior to the start of any crane equipment operations, the Contractor shall make all necessary applications and obtain all required permits from the Federal Aviation Administration (F.A.A.). When the F.A.A. has jurisdiction, the sequence of operations, timing and methods of conducting the Work shall be approved by the F.A.A.

4.3.13 The Contractor will establish an approved Silica Health and Safety Program when tasks generating crystalline silica dust are being performed. This program shall include engineering, work practice, and respiratory protection controls to reduce worker exposure to airborne respirable crystalline dust to levels that are as low as reasonably achievable. When tasks are performed that generate airborne crystalline dust, the Contractor will minimize worker exposure to dust by one, or a combination of the following methods: 1) dust suppression with water, 2) local exhaust ventilation to a high-efficiency dust collector, and/or 3) appropriate respiratory protection devices. The Contractor shall provide a trained, competent person, as defined by OSHA 29 CFR 1926, on site at all times to implement the Silica Health and Safety Program when tasks generating crystalline silica dust are being performed.

4.4 RESPONSIBILITY FOR THE WORK

4.4.1 The Contractor shall be responsible to the State and to any separate Contractors and/or consultants including, without limitation, the Architect/Engineer, for the acts, errors and omissions of its employees, Subcontractors and their agents and employees that injure, damage or delay such other Contractors and/or consultants in the performance of their work.

4.4.2 The Contractor shall be responsible for all damage or destruction caused directly or indirectly by its operations to all parts of the Work, both temporary and permanent, and to all adjoining property.

4.4.3 The Contractor shall, at its own expense, protect all finished work and keep the same protected until the Project (or identifiable portions thereof, that are declared as substantially complete and being used) is completed and accepted.

4.4.4 The Contractor shall be responsible for safety and for any damage or injury which may result from the Contractor's failure or improper construction, maintenance or operation.

4.4.5 In order to protect the lives and health of its employees, the Contractor shall comply with all applicable statutes and regulations and pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc. and shall maintain accurate records of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work arising out of and in the course of employment on work under the Contract. If a conflict should exist with the requirements of the Federal Occupational Safety and Health Act of 1970, then the most stringent statute or pertinent provision shall apply.

4.5 INDEMNIFICATION

4.5.1 The Contractor shall assume all risk of and responsibility for, and agrees to protect, defend and indemnify the State of New Jersey, its agents, and its employees, from and against, any and all claims, demands, suits, actions, recoveries, judgment and costs of expenses in connection therewith on account of the loss of life, property, injury or damage to the person, body or property of any person or persons whatsoever, resulting from the Contractor's performance on the Project or through the use of any improper or defective machinery, implements or appliances, or through any act or omission on the part of the Contractor or its agents, employees or servants, which shall arise from or result directly or indirectly from the Work and/or materials supplied under this Contract. This indemnification obligation is not limited by, but is in addition to, the insurance obligations contained in this Contract.

4.5.2 In any and all claims against the State or any of its agents or employees, any employees of the Contractor or Subcontractor or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under this section shall not be limited in any way as to the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under worker's compensation acts, disability benefit acts, or other employee benefit acts.

4.6 SUPERVISION

4.6.1 The Contractor shall attentively supervise and direct the Work. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

4.6.2 The Contractor shall employ a full-time competent superintendent and necessary foremen and assistants, who shall be in attendance on the Project Site during the progress of the Work. The superintendent shall represent the Contractor, and all communications given to the superintendent shall be binding upon the Contractor. The State reserves the right to require a change in superintendent if the superintendent's performance, as judged by the DPMC, is deemed to be inadequate. Upon application in writing, and if deemed appropriate and expressly approved by the DPMC, the requirement for a full-time superintendent may be waived. If such a waiver is permitted, the Contractor shall employ a full-time competent foreman who shall be in attendance on the site during the progress of work and shall represent the Contractor, and all communications given to the foreman

shall be binding upon the Contractor. The Contractor shall not employ persons unfit or unskilled in the assigned area of work.

4.6.3 The Contractor shall ensure that its Subcontractors shall likewise have competent superintendents in charge of their respective portions of the Work at all times. Upon application in writing, and if deemed appropriate and expressly approved by the DPMC, the requirement for a full-time superintendent may be waived. If such a waiver is permitted, the Subcontractor shall employ a full-time competent foreman who shall be in attendance on the site during the progress of work and shall represent the subcontractor, and all communications given to the foreman shall be binding upon the subcontractor. The Subcontractor shall not employ persons unfit or unskilled in the assigned area of work. If it becomes apparent that a Subcontractor does not have its portion of the Work under control of a competent foreman, the Contractor shall have the obligation to take appropriate steps to immediately provide proper supervision.

4.6.4 The Contractor shall employ qualified competent craftsmen in their respective lines of work. The State may require evidence that all employees have received sufficient training to execute the Work.

4.6.5 If, due to a trade agreement or project labor agreement, standby personnel are required to supervise equipment installation or for any other purpose during the normal working hours of other trades, the Contractor normally required to provide the standby services shall be deemed to have evaluated and included the costs thereof in its bid price and shall provide said services without additional charge.

4.6.6 The Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ any unfit person or anyone not skilled in the task assigned.

4.7 SHOP DRAWINGS AND OTHER SUBMITTALS

4.7.1 The Contractor shall, within two weeks of the Notice to Proceed, submit to the Architect/Engineer, shop drawings and sample submission schedule for approval, which shall be used as a basis for complying with the overall progress schedule. The Contractor shall obtain, from its Subcontractor(s), all submittals including shop drawings, details, and schedules. The Contractor shall review the submittals for completeness and conformity with the Contract Documents, and shall stamp the submittals "approved". The Contractor shall promptly forward two copies of each submittals in reproducible form to the Architect/Engineer, so as to cause no delay in its own work or that of any other contractor. The DPMC Project number and the drawing and specification references shall be written or typed on all submissions. Failure to comply with these instructions will be sufficient reason to return the drawing to the Contractor without approval and any resulting delay in the Project shall be the sole responsibility of the Contractor.

4.7.2. The Architect/Engineer will review shop drawings and other submittals with reasonable promptness. The Contractor shall promptly make any corrections, if required by the Architect/Engineer, and resubmit a reproducible copy for approval. Within five (5) working days of final approval, the Contractor shall send the Architect/Engineer a

minimum of seven (7) prints of the finally approved shop drawings as well as seven (7) copies of all catalog cuts.

4.7.3 The Contractor shall prepare original shop drawings, and not simply copy the Contract Drawings for submission as shop drawings. All shop drawing sizes shall be in multiples of 9" x 12" (e.g., 18" x 24", 24" x 27", 24" x 36", etc.) as approved by the Architect/Engineer.

4.7.4 Any deviations or changes from the requirements of the Contract Documents, must be approved by the Architect/Engineer. A Contractor seeking approval for any deviations or changes must: a) make a written request for the proposed change; b) provide to the Architect/Engineer a detailed narrative description of the proposed change; c) highlight on the applicable drawing the proposed change; and d) furnish a detailed description of all potential impacts on the schedule and project budget.

4.7.5 Substitutions

4.7.5.1 Where any particular brand or manufactured article is specified, it shall be regarded as a standard. Similar products of other manufacturers, capable of equal performance and quality, may be accepted if approved by the Architect/Engineer and accepted by DPMC in writing.

4.7.5.2 In the event that a Contractor proposes a substitution to the specified equipment or materials, it shall be the Contractor's responsibility to submit proof of equality and to provide and pay for any tests which may be required by the DPMC in order to evaluate the proposal. If there is a substantial cost savings between the substitution and the specified equipment or material, the difference will be returned to the State in the form of a credit Change Order.

4.7.5.3 The application for the approval of a substitution must be submitted on the State form within 10 days of Notice to Proceed. Further, the submission shall include the following requirements:

- a. A Full and complete identification information;
- b. The identification of the paragraph and section of the specifications for which the substitution is proposed. The attachment of data indicating in detail whether and how the equipment or material differs, if at all, from the article specified;
- d. A detailed explanation of any effect the proposed substitution will have on the scope of the Work and a certification that the Contractor agrees to be responsible for any and all resulting added costs to its Work and to any additional costs incurred by the Architect/Engineer in time, labor and/or redesign of the Contract Documents;
- e. The submission of documents that demonstrate proof of equality, along with an agreement to have such tests performed at the Contractor's own expense as may be required for approval by the DPMC and/or the Architect/Engineer. The Contractor shall be responsible for the cost of reviews by the Architect/Engineer of subsequent submissions of additional information.

4.7.5.4 No Contractor shall base a bid on a substitution that may have been approved on previous Projects. Bids shall be based solely on plans and specifications of this Project.

4.7.5.5 The Contractor shall not proceed with the purchase or installation of a substitution without the written approval of DPMC. Any such installation may result in the assessment of costs for its removal at the Contractor's expense, and/or other damages and/or termination of the Contract for default.

4.7.6 Additional Submissions

4.7.6.1 Samples: The Contractor shall furnish, for approval, all required samples. Such samples shall be submitted in accordance with the shop drawing and sample submittal schedule. All work must be installed in accordance with approved samples.

4.7.6.2 Utility Service Connections: With respect to plumbing, fire-protection, HVAC, electrical and other machinery and mechanical equipment items requiring utility service connections, the Contractor must submit the respective shop drawings with the manufacturer's certified rough-in drawings, indicating accurate locations and sizes of all service utility connections.

4.7.6.3 Sleeve and Opening Drawings: Prior to installing service utilities or other piping, through structural elements of the building, the Contractor shall prepare and submit, for approval by the Architect/Engineer, accurate dimensional drawings indicating the positions and sizes of all sleeves and openings required to accommodate the Work and installation of the Contractor's piping, equipment, etc. All such drawings must contain reference to the established dimensional grid of the building. Such drawings must be submitted in accordance with the approved shop drawing and sample submission schedule.

4.7.6.4 Control Valve and Circuit Location Charts and Diagrams: For all plumbing, fire-protection, HVAC and electrical work, the Contractor shall prepare a complete set of inked or typewritten control valve and circuit location diagrams, charts and lists identifying and locating all such items, and shall place the charts, diagrams and lists under frame glass in designated equipment rooms. The Contractor shall also furnish one-line diagrams, as well as such color-coding of piping, wiring and other necessary identifications as specified or required. This information is to be framed under glass and displayed where directed.

4.7.6.5 Coordination Drawings: The Contractor shall create and update a complete, composite set of Coordination Drawings. The purpose of these drawings is to identify coordination and interference problems prior to installation. Coordination Drawings are required for all equipment rooms, above ceiling spaces, shared chases, and other areas where the Work of two or more trades is to be installed. The drawings shall be drawn to a scale not smaller than 1/4"=1'-0" (30"x42" sheet size) and shall show clearly in both plan and elevation that all Work can be installed without interference. At a minimum these drawings shall indicate:

- a. The interrelationship of equipment and systems;
- b. Required installation sequences;

- c. Equipment foundations and pads, equipment, piping, conduits, racks, ductwork, insulation, panels, control centers, sprinkler and fire protection systems etc. and required clearances.

The Contractor shall prepare the coordination drawings based on the submitted shop drawings and Contract Documents. The Contractor shall prepare, submit and receive approvals for the Coordination Drawings before any sleeves or inserts are set, any floor openings are core drilled, or any equipment, equipment foundations, or related work is installed. The cost of preparing approved Coordination Drawings shall be included in the Contractor's price. DPMC may require the Contractor to identify Coordination Drawings as an item within the Schedule of Values, and incorporate them into in the Project schedule.

4.8 AS-BUILT DRAWINGS

4.8.1 The Contractor and each Subcontractor shall maintain on the Project Site at all times one set of drawings to be marked "AS-BUILT." The DPMC has the right to rely on accuracy of the "as-built" drawings provided by the Contractor. During the course of the Project, the Contractor shall mark these drawings with colored pencils to reflect any changes, as well as the dimension and the location of all pipe runs, conduits, traps, sprinkler and fire protection lines, footing depths or any other information not already shown on the drawings or differing therefrom. All buried utilities outside the building shall be located by a survey performed by a licensed surveyor who shall certify as to its accuracy. These marked-up drawings and surveys shall remain current and shall be made available to the DPMC or Architect/Engineer at all times during the progress of the Work.

4.8.2 In instances where shop drawings and/or erection drawings, of a scale larger than the Contract Drawings, are prepared by the Contractor, such drawings may be acceptable "as-built" drawings provided they are updated. A master sheet of the same dimensions as the Contract Drawings shall be prepared by the Contractor that shall indicate, sheet by sheet, a cross-reference to all shop drawings pertaining to that drawing.

4.8.3 The Contractor shall submit the "as-built" documents to the Architect/Engineer with a certification as to the accuracy of the information thereon at the time of Contract completion and before final payment will be made to the Contractor. After acceptance by the Architect/Engineer, the Contractor will furnish two sets of all shop drawings used for "as-built" documentation.

4.8.4 All "as-built" drawings as submitted by Contractors shall be dated and labeled "AS-BUILT" above the title block. This information shall be checked, edited and certified by the Architect/Engineer, who will then transpose such information from the Contractor's "as-built" drawings to the original drawings. Where shop drawings have been used by the Contractor for "as-built" documentation, the master sheet providing cross reference information, as described in section 4.8.2, shall be included in the set of "as-built" drawings furnished to DPMC.

4.9 EXCAVATIONS, CUTTING AND PATCHING

4.9.1 Soil borings, test pits or other subsurface information may be secured by an independent Contractor retained by the State prior to design and construction of the Project and, if obtained, may be included in the Contract Documents for the Contractor's use. The Contractor assumes full responsibility for interpretation of said information.

4.9.2 The Contractor shall be responsible for furnishing and setting of sleeves, built-in items, anchors, inserts, and other necessary materials for its work and for all cutting, fitting, closing in, patching, finishing, or adjusting of its work in new and/or existing construction, as required for the completed installation.

4.9.3 Approval in writing from the DPMC and the Architect/Engineer must first be obtained by the Contractor before cutting or boring through any roof, floor beams, floor construction or structural members.

4.10 TESTING

4.10.1 The Contractor shall notify the DPMC in writing of all work required to be inspected or tested. The notice shall be provided no later than five working days prior to the scheduled inspection or test. The Contractor shall bear all costs of such inspections or tests, except for Code inspections as stated in section 4.3 of this document.

4.10.2 When mechanical, electrical or other equipment is installed, it shall be the responsibility of the installing Contractor to maintain, warrant and operate it for such period of time as required by the Contract Documents or as necessary for the proper inspection and testing of the equipment and for adequately instructing the State's operating personnel. All costs associated with the maintenance, warranty, operations, inspection and testing of equipment, as well as instructing State personnel, shall be borne by the Contractor installing the equipment. All tests shall be conducted in the presence of, and upon timely notice to, the DPMC, prior to acceptance of the equipment.

4.10.3 DPMC shall have the authority to direct in writing that special or additional inspections or tests be performed. The Contractor shall comply and give notice as detailed above.

4.10.4 In the event such special or additional inspections or testing reveal a failure of the Work to comply with the terms and conditions of the Contract, the Contractor shall bear all costs thereof, including all costs incurred by the State made necessary by such failures.

4.10.5 The Contractor shall utilize inspection or testing from those firms/entities pre-qualified by DPMC. Failure to use a firm/entity pre-qualified by DPMC shall be grounds for rejection of the inspection or test as non-conforming.

4.10.6 All submittals of inspections, test reports or requests for approval shall be accompanied by a certification signed by the Contractor, attesting to: the Contractor's knowledge of the submittal; acceptance of its findings; acknowledgment that material testing meets the required standards; and a certification of the report's representation of

the facts. Failure to provide the written certification shall be grounds for rejection of the submittal.

4.10.7 The Contractor shall ensure that a copy of the inspection report is transmitted directly to the Architect/Engineer and the DPMC. The Contractor shall ensure that it includes in all of its subcontracts and purchase orders for inspection and testing, the requirement for the inspection or testing firm/entity to submit a copy of the report directly to the DPMC representative. The Contractor shall ensure that all such reports are submitted within fourteen (14) calendar days of the test or inspection.

4.10.8 In addition to tests performed by the Contractor, the State reserves the right to engage an independent testing agency or firm to perform testing inspections. The Contractor shall provide full access, provide samples, and cooperate fully with this testing agency.

4.10.9 Testing requirements for real property installed equipment (RPIE) to be furnished by the Contractor, when such testing is required by Code, Contract, or the manufacturer, shall be performed by a testing laboratory pre-qualified by DPMC, or in the absence of such, by the manufacturer or its authorized representative. The Contractor shall provide five working days' notice to the DPMC representative, to allow sufficient opportunity to witness the test.

4.10.10 The DPMC may order that any part of the Work be re-examined by the DPMC, and if so ordered, the Contractor shall open or uncover such work for re-inspection by the DPMC. If such work is found to be in accordance with the Contract, the DPMC shall pay the cost of re-inspection; however, if such work is not found to be in accordance with the Contract, the Contractor shall be responsible for the cost of re-inspection and replacement of any defective or non-conforming work.

4.11 EQUIPMENT AND MATERIALS

4.11.1 The Contractor warrants that all materials and equipment furnished under the Contract will be new, unless otherwise specified, and that all work will be of good quality, free from faults, defects, and installed in conformance with the Contract Documents. All work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and rejected by the DPMC or the Architect/Engineer. If required by the Architect/Engineer or the DPMC, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty shall be in addition to but not in lieu of any other warranty or guarantee provided for in the Contract.

4.11.2 The Contractor shall submit to the Architect/Engineer an original and six copies of the request for approval of materials on the form provided by DPMC for approval. Each item of material listed shall be marked "As Specified", "Substitution" or "Unspecified" as appropriate.

4.11.3 The Contractor shall furnish and deliver the necessary equipment and materials in ample quantities and as frequently as required to avoid delay in the progress of the Work and shall store them so as not to cause interference with the orderly progress of the Project.

4.11.4 The Contractor shall furnish and pay for all necessary transportation, storage, scaffolding, centering, forms, water, labor, tools, light and power and mechanical appliances and all other means, materials and supplies for properly executing the Work under this Contract, unless expressly specified otherwise in the Contract Documents. The Contractor shall have its representatives at the Site to accept delivered materials. State agencies employees and/or representatives will not accept materials, nor will State agency employees and/or representatives be responsible for damage, theft, or disappearance of the Contractor's materials, equipment, tools, or other property.

4.11.5 Products manufactured in the United States shall be used in this work, whenever available. Wherever practicable, preference shall be given at all times to material and equipment manufactured or produced in the State of New Jersey, where such preference is reasonable and will best serve the interest of the State.

4.11.6 No materials, equipment, or supplies for the Work shall be purchased by the Contractor subject to any lien or encumbrance or other agreement by which an interest is retained by the seller. This clause shall be a condition included in all agreements between the Contractor and its Subcontractors. The Contractor warrants, by signing its invoice, that it has good and sufficient title to all such material, equipment and supplies used by it in the Work, free from all liens, claims or encumbrances.

4.12 TEMPORARY FACILITIES

The Contractor shall be responsible for providing for its own storage areas, employee vehicular parking and staging areas, excavation borrow/spoils designated areas, commercial canteen areas, and all other areas necessary for use by the Contractor. The Contractor shall locate these areas to suit Project requirements, subject to DPMC approval.

4.12.1 Field Offices - The Contractor will provide and maintain during the contract duration an on-Site suitable weather-tight insulated field office conveniently located, and shall maintain therein a complete set of Contract Documents including plans, specifications, CPM network diagrams, Change Orders, logs and other details and Project correspondence. Subject to the DPMC's written approval and at a date designated by DPMC, the field office may be removed upon enclosure of the building and space may be allocated for field offices within the building. The contents and operations will be transferred to the interior of the Project building by the Contractor, and said office(s) shall be maintained by the Contractor until final acceptance or until the DPMC approves its removal. The Contractor will be responsible to obtain and pay for all permits required for the Contractor's field offices.

4.12.2 Telephones - The Contractor shall provide its own telephones. The State will be responsible only for the cost of calls made by State employees. if there is a documented cost for same.

4.12.3 Storage - The Contractor will provide and maintain, for its own use suitable and safe temporary storage, tool shops, and employees' sheds for proper protection, storage work and shelter. The Contractor shall maintain these structures properly and remove the structures at the completion of work. The Contractor shall be responsible to maintain

these facilities and the areas around the facilities in a clear and clean manner. The Contractor shall be responsible for correcting defects and damage caused by such use. Rooms in buildings at the Project Site may be used as shops and storerooms, conditioned upon written approval from DPMC.

4.12.4 Toilet Facilities

- a. The Contractor shall provide and pay for suitable temporary toilets at an approved location on the Site and prior to the start of any field work. The toilet facilities shall comply with federal, State and local laws and regulations. The Contractor will be responsible for maintenance, removal and relocation as described hereinafter.
- b. The Contractor shall provide a temporary toilet and/or indoor toilet connected to water and sewer to accommodate the meeting room and the Architect/Engineer's office, as well as the DPMC office.
- c. Toilets shall be serviced by a qualified and experienced firm authorized to maintain services.
- d. Each portable toilet facility shall be maintained in a neat and clean condition and serviced at least twice a week, including the removal of waste matter, sterilizing, recharging tank, refilling tissue holders, and thoroughly cleaning and scrubbing entire interior.
- e. Toilet facilities in a multiple-story building shall be located on no less than every other floor, unless otherwise directed in writing.
- f. Toilet service shall be relocated inside the building and connected to water and sewer as the progress of the Work will allow.
- g. When temporary toilets are connected to water and sewer lines, precautions shall be taken to prevent freezing.
- h. The Contractor shall remove the temporary toilet units from the Work Site at the completion of the Work, or when so directed by the DPMC or the Architect/Engineer.
- i. Workers are not to use the finished bathroom and toilet facilities in the Project buildings. Reasonable steps must be taken by the Contractor to enforce this rule.

4.12.5 Access, Roads and Walks

- a. The Contractor shall be responsible for providing and maintaining unobstructed traffic lanes on the designated construction access routes shown on the Contract Drawings or as reasonably required so as to perform the Work. The Contractor shall provide and maintain all reasonably required safety devices. The Contractor shall provide any necessary additional materials, grading and compaction, and shall remove snow and debris as necessary to provide and maintain the access roadbed and pedestrian ways in serviceable condition.
- b. The Contractor shall be responsible for constructing and maintaining all roadways, drives and parking areas within or proximate to the Site free and clear

of debris, gravel, mud, snow, ice, or any other Site materials, by ensuring that all reasonably necessary measures are taken to prevent such materials from being deposited on such surfaces. This includes, as may be appropriate, the cleaning of vehicle wheels and/or other necessary maintenance, prior to exit from the Construction Site. Should such surface require cleaning, the Contractor will clean these surfaces without additional cost to the State. The Contractor will be held accountable for any citations, fines, or penalties imposed on the State for failing to comply with local rules and regulations related to Site and off-Site maintenance.

c. The Contractor shall not commence final construction of permanent driveways, parking areas or walks without the written approval of the DPMC. The Contractor shall provide additional materials and labor for maintaining and reworking the sub-grade prior to completion of the Work, to ensure improvements conform fully to the specifications.

d. The Contractor shall obtain written permission from the State for the use of any existing driveways or parking areas not specifically designated for such use in the Contract Documents. If permission is granted, the Contractor shall maintain such driveways and areas in good condition during the construction period, and at the completion of the Project, shall leave them in the same or better condition as at the start of the Work. Conditions before use shall be carefully photographed and documented by the Contractor.

4.12.6 Light and Power

a. The Contractor shall extend electrical service to the building or buildings at locations approved by the DPMC. Temporary electrical service shall be independent of the existing permanent service. Initial temporary service shall be three phase or single phase as indicated in the Contract Documents. The Contractor is responsible to investigate and verify the appropriateness and availability of electrical service with the local utility company prior to the bid date. The Contractor's bid shall be deemed to include all costs associated with providing this power. Temporary light and power installations, wiring, and miscellaneous electrical hardware must meet the electrical Code and will be inspected by NJUCC officials. The Contractor shall provide the necessary distributing facilities and a meter, and shall pay the cost of running temporary services from the nearest utility company power pole. All costs shall be included in the Contractor's bid.

b. In the event that a water well is the source of water supply for the Project, the extension of electrical service shall include the necessary wiring of sufficient capacity to the location of the well for the operation of the well pump. Where service of a type other than herein mentioned is required, the Contractor requiring it shall install and pay all costs of such special service. The size and incoming service and main distribution switch and panel shall be sized as any service by NEC requirements.

c. The Contractor shall provide all electrical service for the operation of elevator equipment during construction.

d. The Contractor shall pay for the cost of all electric energy used on distribution lines installed.

e. The Contractor shall provide and pay for all maintenance, servicing, operation and supervision of the service and distribution facilities.

f. If the Contractor fails to carry out its responsibility in the supplying uninterrupted light and power as set forth herein, the Contractor shall be held responsible for such failure, and the DPMC shall have the right to take such action as is deemed proper for the protection and conduct of the Work. Any costs associated with DPMC obtaining or supplying light and power shall be deducted from any payment due to the Contractor.

g. The Contractor shall comply with the requirements of the Federal Occupational Safety and Health Act of 1970 with regard to temporary light and power.

4.12.7 Temporary Enclosures

Whenever necessary in order to maintain proper temperatures for the execution or protection of the Work, the Contractor shall furnish and maintain temporary enclosures for all openings in exterior walls that are not enclosed with finished materials. Temporary wood doors shall be provided at door openings.

4.12.8 Temporary Heating, Ventilation and Air Conditioning

a. Prior to Enclosure - Prior to the building being enclosed by walls and roof, if the outside temperatures falls below 45 degrees Fahrenheit ("F") at any time during the day or night, and heat is required for work in progress or for its protection or curing, the Contractor shall furnish, at its expense, acceptable means to provide sufficient temporary heat to maintain a temperature required by the Work being performed but in no case less than 45 degrees F.

b. Generally Enclosed

(1) For the purposes of establishing the beginning of the Contractor's obligation to provide temporary heat, a building or major unit thereof shall be considered generally enclosed when (a) the exterior walls have been erected, (b) a temporary roof or permanent roof is installed and in a watertight condition, and (c) temporary or permanent doors are hung and window openings are closed with either permanent or temporary weather-tight enclosures. A major unit of buildings as referred to herein shall be: (a) an entire separate structure, or (b) a fully enclosed wing which shall have a floor area equal to at least 50% (fifty percent) of the total floor area of the Project.

(2) As soon as the DPMC determines that the building, or a major unit thereof, is "generally enclosed" by walls and roof, and when the outside temperature falls below 55 degrees F. at any time during the day or night, the Contractor shall furnish sufficient heat by the use and maintenance of LP gas heaters or other acceptable means to maintain a temperature of not less than 55 degrees F. within the enclosed area of the building at all

times, and shall remove such heaters when no longer required. The Contractor will be held responsible for providing temporary heat and for all damages resulting from freeze-ups, for the duration of the Project from the time the building is generally enclosed to final acceptance and occupancy. The Contractor shall remove soot, smudges, and other deposits from walls, ceilings, and all exposed surfaces which are the result of the use of heating equipment, including the permanent heating system, during the period of its use for supplying heat. The Contractor shall not do any finish work until the areas are properly cleaned. The Contractor shall provide or arrange, at its own expense, supervision of the heating equipment at all times prior to providing heat, using the permanent heating system. This obligation shall commence immediately after the acknowledged permanent enclosure of the building or buildings, as confirmed by the DPMC. The Contractor shall furnish and pay for all fuel for heat required during the period when the building is generally or permanently enclosed.

(3) The Contractor shall not assume that the permanent heating system or any part thereof will be available for furnishing of temporary heat during the period for which temporary heat is required. The Contractor's base bid price shall therefore include the cost of all equipment necessary for providing temporary heat as required by the Contract Documents. The Contractor may use the permanent heating system, with written approval from DPMC. Such use however does not cause to commence the equipment's warranties and guarantees. The equipment's warranties and guarantees shall not commence to run until the State takes beneficial use of the Project and facility for the purposes intended.

(4) All heating equipment shall be NFPA-approved and connected to approved flues to the atmosphere. Heaters shall be approved by a recognized testing laboratory and must be equipped with a positive shut-off safety valve.

(5) Storage of gas cylinders within the building will not be permitted at any time.

(6) The Contractor shall provide fire extinguishers on each floor where heaters are used, and the areas must be adequately ventilated.

c. Permanent Enclosure

(1) When the building enclosure has been confirmed by the Architect/Engineer has been completed in accordance with the Contract Documents, and to the satisfaction of DPMC, it shall be considered permanently enclosed. The Architect/Engineer will also confirm in the job meeting minutes that the building, or a major unit thereof, is permanently enclosed.

(3) The Contractor shall install adequate controls to make such temporary connection as required for the operation of the HVAC system.

Should the heating system be designed for the tie-in to existing steam lines for resource of heat, the State will provide steam for temporary heat through the Project permanent heating system, at no cost to the Contractor, after the tie-in is completed by the Contractor.

(4) When the building enclosure has been confirmed by the A/E as completed, the Contractor may request permission to operate the permanent HVAC system to meet its temporary HVAC obligation. The Contractor shall maintain a minimum temperature of 55 degrees F., or a higher temperature, not to exceed 75 degrees F., as may be directed by the Contract Documents for the proper conduct and protection of the Work. The Contractor shall do so until such time as its work is completed and accepted and the Contractor is relieved of this requirement in writing by the DPMC. The Contractor shall pay for and be responsible for the maintenance in accordance with the manufacturer's recommendations, operation and supervision of the HVAC system, including the cost of all water, electricity, and fuel, until the State assumes beneficial occupancy/use of the Project.

4.12.10 Temporary Water

a. The Contractor shall provide, protect and maintain an adequate valved water supply. If the source of water supply is a well, provisions covering the supply water will include the installation of necessary power-driven pumping facilities. The well shall be protected against contamination. The water supply shall be tested periodically by the Contractor, and if necessary, shall be chlorinated and filtered. All costs of providing water will be paid for by the Contractor.

b. The Contractor is responsible to protect all temporary and permanent water lines from damage or freezing. Should water connections be made to an existing line, the Contractor shall provide a positive shut-off valve at its own cost and expense.

4.12.11 Standby Personnel

If, pursuant to trade agreement to which the Contractor is a party, the Contractor is obligated, to employ standby personnel then the Contractor shall determine and include all such costs thereof in its bid proposal. The Contractor shall not, at any time, make a claim to the State for costs relating to standby maintenance or standby supervision for electric motor-driven or other equipment.

4.12.12 Dust Control

a. The Contractor shall provide and maintain necessary temporary dust-proof partitions around areas of Work in any existing building or in new building areas as directed by the Architect/Engineer or the DPMC.

b. The Contractor shall provide and maintain Site dust control of Projects with on-Site construction as directed by the Architect/Engineer or the DPMC.

4.13 STORAGE AND SITE MAINTENANCE

4.13.1 The Contractor shall confine its apparatus, the storage of its equipment, tools and materials, and its operations and workers to areas permitted by law, ordinances, permits, and Contract as set forth in the Contract Documents, the rules and regulations of the State, or as ordered by the DPMC. The Contractor shall not unreasonably encumber the Site or the premises with materials, tools and equipment.

4.13.2 The Contractor shall, at all times during the progress of the Work keep the premises and the job Site free from the accumulation of all refuse, rubbish, scrap materials and debris caused by its operations and/or the actions of its employees, Subcontractors and/or workers, to ensure that, at all times, the premises and Site shall present a neat, orderly and workmanlike appearance. This is to be accomplished as frequently as is necessary by the removal of such refuse, rubbish, scrap materials and debris from the Site and the State's premises. Loading, cartage, hauling and dumping of same will be at the Contractor's expense.

4.13.3 At the completion of the Work, the Contractor shall remove all of its tools, construction equipment, machinery, temporary staging, false work, mock-ups, form work, shoring, bracing, protective enclosures, scaffolding, stairs, chutes, ramps, runways, hoisting equipment, elevators, derricks, cranes, and any other materials and equipment brought onto the Project Site.

4.13.4 Should the Contractor not promptly and properly discharge its obligation relating to Site maintenance and/or final clean up, the State shall have the right to employ others and to charge the resulting cost to the Contractor after first having given the Contractor a three-working day written notice of such intent.

4.13.5 The Contractor's responsibilities for final clean up shall include:

- a. Removal of all debris and rubbish resulting from or relating to the Contractor's work. Rubbish shall not be thrown from building openings above the ground floor unless contained within chutes.
- b. Removal of stains from glass and mirrors. Glass shall be washed and polished inside and outside.
- c. Removal of marks, stains, fingerprints, soil, dust or dirt from painted, decorated or stained woodwork, plaster or plasterboard, metal acoustic tile and equipment surfaces.
- d. Removal of spots, paint and soil from resilient, glazed and unglazed masonry and ceramic flooring and wall work.
- e. Removal of temporary floor protections; and cleaning, washing or otherwise treating and/or polishing, as directed, all finished floors.
- f. Cleaning of exterior and interior metal surfaces, including doors, window frames and hardware, of oil stains, dust, dirt, paint, etc. Polishing and removal of fingerprints or blemishes from such surfaces shall be completed, as applicable.

- g. Restoration of all landscaping, roadways and walkways to preexisting condition. Damage to trees and plantings shall be repaired in the next planting season, and such shall be guaranteed for one year from the date of repair and/or replanting.

4.13.6 All construction equipment, materials and/or supplies of any kind, character or description, regardless of value, which remain on the job Site for more than 30 (thirty) calendar days from the date of the Certificate of Final Acceptance, shall become the property of the State. Such construction equipment, materials and/or supplies will be disposed of in any manner the State shall deem reasonable and proper. The cost of this disposal will be deducted from any sums due the Contractor. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the State.

4.14 CUT-OVERS AND INTERRUPTIONS

All cut-overs of mechanical and electrical services to existing buildings shall be approved, scheduled and coordinated in advance with the DPMC's representative and performed at a time convenient to the occupants of said buildings so as not to unreasonably interfere with its operations.

4.15 PROTECTION/SAFETY

4.15.1 Safety Precautions and Programs – The Contractor shall be responsible for initiating, maintaining and supervising all required safety precautions and programs in connection with the Work. The Contractor shall designate a responsible member of its organization at the Site whose duty shall be the prevention of accidents. This person shall be competent to review, implement and coordinate the safety programs being performed as required by Occupational Safety and Health Administration (OSHA) or any other agency having authority over safety on a State Construction Site.

4.15.2 Protection of Persons

- a. The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:
 - (1) Every employee on the Site and all other persons who may be affected thereby;
 - (2) All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the Site, under the care, custody or control of the Contractor, or any of its Subcontractor(s) or lower tier sub-Subcontractor(s); and
 - (3) Other property at the Site or adjacent thereto (whether owned by the State or not), including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

b. The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

c. The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including but not limited to rails, night-lights, aircraft warning lights, the posting of danger signs and other warnings against hazards, promulgating safety regulations, notifying Owners and users of adjacent utilities and other means of protection against accidental injury or damage to persons and property.

d. The Contractor shall not load or permit any part of the Work to be loaded so as to endanger the safety of the project, its employees, or any other person on the project Site.

e. The Contractor shall promptly remedy all damage or loss to any property caused in whole or in part by the Contractor, any of its Subcontractors, lower tier Subcontractors, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible. These obligations are in addition to those stated elsewhere herein.

4.15.3 Protection of Property

The Contractor shall have full responsibility to install, protect, and maintain all materials and supplies in proper condition whether in storage or off the site and to immediately repair and/or replace any such damage until Final Acceptance. The Contractor shall maintain an inventory of all materials and supplies for the Work at the Site, that are delivered to the site, or delivered to approved off-site storage facilities. The State shall not be liable for any damage, theft or negligent injury to the Contractor's property.

4.15.4 Hazardous Materials

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

b. The Contractor shall maintain all records, reports and files of the general storage and handling of hazardous materials as required by any and all federal, State and/or local regulatory agencies.

4.16.5 Emergencies

In any emergency affecting the safety of persons or property, the Contractor shall act with diligence to prevent threatening injury, damage or loss. In such case, the Contractor shall immediately, but in no case, not more than 24-hours following the emergency, notify the DPMC and the Architect/Engineer of the action taken.

4.16 UNCOVERING AND CORRECTION OF WORK

4.16.1 Uncovering of Work

- a. The Contractor is obligated to provide reasonable notice to the DPMC and/or the Architect/Engineer of all work scheduled to be covered, to permit DPMC and the Architect/Engineer the opportunity to inspect the Work prior to actual covering. If any portion of the Work is covered prior to inspection by the DPMC or the Architect/Engineer, it shall be uncovered for observation. Uncovering and replacement of the covering shall be at the Contractor's expense.
- b. The DPMC and/or the Architect/Engineer may request any work be uncovered by the Contractor for inspection. If such work is found to be in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be reimbursed to the Contractor. If such work is found not to be in accordance with the Contract Documents, the Contractor shall pay all associated costs.

4.16.2 Correction of Work

- a. The Contractor shall promptly correct all work rejected by the DPMC or the Architect/Engineer as defective or failing to conform to the Contract Documents, whether observed before or after final acceptance and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected work, including the costs of all consultant services including but not limited to the Architect/Engineer's additional services.
- b. The Contractor shall remove from the site, at its own expense, all portions of the Work which are defective or non-conforming and which have not been corrected, unless removal is waived by the DPMC.
- c. If the Contractor fails to correct defective or non-conforming work in a reasonable time fixed by written notice from DPMC, then DPMC may make arrangements for such correction by others and charge the cost of so doing to the Contractor.
- d. If the Contractor does not proceed with the removal and correction of such defective or non-conforming work within a reasonable time, fixed by written notice from the DPMC or the Architect/Engineer, any materials or equipment shall become the property of the State and the DPMC may remove and dispose the non-conforming work in any manner to best meet the interest of the State. If such material is sold and the proceeds of the sale do not cover all costs which the Contractor should have borne and any additional cost incurred by the State in the uncovering, removal, disposal and correction of non-conforming work, the difference shall be charged to the Contractor and an appropriate credit Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the State.
- e. The Contractor shall be responsible for the cost of making good all work destroyed or damaged by such correction or removal.

- f. Notwithstanding other obligations within the Contract Documents, nothing contained herein shall be construed to establish a time or date limitation upon which the DPMC must discover non-conforming work.

4.16.3 Acceptance of Non-Conforming Work

The DPMC may determine that the best interests of the State will be served by accepting defective or non-conforming work instead of requiring its removal and correction. In such instance, the DPMC may, by any means available, exact an appropriate reduction in the Contract sum. Such adjustment shall be effected regardless of final payment having previously been made, and the Contractor and/or its surety shall be responsible for promptly remitting any funds due the State as a result thereof.

4.17 LAYOUT AND DIMENSIONAL CONTROL

4.17.1 The Contractor shall be responsible for locating and laying out the building and all of its parts on the site, in strict accordance with the Contract Documents, and shall accurately establish and maintain dimensional control. The Contractor shall employ and pay for the services of a competent and licensed New Jersey engineer or land surveyor who shall be pre-qualified by DPMC to perform all layout work, and to test the level of excavations, footing base plates, columns, walls and floor and roof lines, and furnish to the Architect/Engineer, as the Work progresses, certifications that each of such levels is as required by the drawings. The plumb lines of walls, shall be tested and certified by the surveyor as the Work progresses.

4.17.2 The Contractor's engineer/surveyor, in the course of layout work either on the site or within any building, shall establish all points, lines, elevations, grades and bench marks for proper control and execution of the Work. The Contractor's engineer/surveyor shall establish a single permanent benchmark as set forth in the Contract Documents to which all three coordinates of dimensional control shall be referenced. The Contractor's engineer/surveyor shall verify all Owner-furnished survey data including but not limited to topographical and utility location points, lines, elevations, grades and benchmarks, and buildings. Should any discrepancies be found between information given on the Contract Documents and the actual site or field conditions, the Contractor shall notify DPMC and the Architect/Engineer in writing of such discrepancy, and shall not proceed with any work affected until receipt of written instructions from the DPMC.

4.18 PROJECT SIGN

The Contractor shall erect and maintain one sign at the Project Site, as set forth in the Contract Documents and located as directed by the Architect/Engineer. Painting shall be done by a professional sign painter, with two coats of exterior paint, colors, letter face and layout as shown. No other sign will be permitted at the site. Upon completion of the Project, and when directed by the Architect/Engineer or the DPMC, the Contractor shall remove the sign.

4.19 SECURITY

4.19.1 The Contractor shall provide all locks, doors and security construction and personnel as required to secure the Project building throughout the period of construction.

4.19.2 The Contractor shall be responsible for the security of any temporary structures located on the premises outside of the building and/or any stored materials.

4.20 DPMC FIELD OFFICE

4.20.1 The Contractor will provide on-site, suitable, separate, weather-tight, insulated (floor, walls, ceilings) field office facilities for the use of DPMC personnel, as more fully described in the Contract Documents. At a minimum, the Contractor is to supply this field office with toilet facilities, heating and air conditioning, tables and chairs, and phone and data communication lines. At a time determined by the DPMC or the Architect/Engineer, the Contractor shall remove field facilities upon enclosure of the Project building and shall relocate the contents and operations of the field office to the interior of the Project building until completion of the Project.

4.20.2 The Contractor shall be responsible for the maintenance of both offices and the meeting room, including the cost of heating, air conditioning, electric current, and janitorial service.

4.21 PHOTOGRAPHS

4.21.1 The Contractor shall submit monthly progress photographs in duplicate to the DPMC, giving six (6) views of the Work with each application for payment until the Project is completed,.

4.21.2 The photographs shall be 8" by 10" shall bear the date and time of the exposure, the DPMC Project number and title, the names of the Contractor and the name of the Architect/Engineer. All photographs shall also be submitted in digital format.

4.22 REPAIR OF FINISHED SURFACES, APPLIED FINISHES, GLASS

4.22.1 The Contractor accepts sole responsibility for repair of uncontrolled dislodging, cracking, delaminating or peeling of finished surfaces such as concrete, pre-cast concrete, cast and natural stone, unit masonry, millwork, plaster, glass and applied finishes such as compound, paint, and special coatings, within the Contract Work and the limits of specified guarantee periods, regardless of the cause.

4.22.2 The Contractor shall be responsible for replacement of all broken glass, regardless of the cause. The Contractor shall replace all broken, scratched or otherwise damaged glass before the completion and acceptance of the Work. If breakage is caused by the Owner, the Contractor will be reimbursed for the replacement costs. The Contractor shall wash all glass on both sides at completion, or when directed, removing all paint spots, stains, plaster, and other materials.

ARTICLE 5 - SUBCONTRACTORS

5.1 SUBCONTRACTORS AND MATERIAL SUPPLIER APPROVALS

5.1.1 Upon their execution, but not less than fourteen (14) calendar days prior to Subcontractor mobilization on the site, and/or Subcontractor billing, the Contractor shall forward to the Architect/Engineer on the form provided by the DPMC the names of all its Subcontractors and suppliers, of such others as the DPMC may direct, proposed to perform the principal parts of the Work. The Contractor shall forward the appropriate DPMC form to the Architect/Engineer for approval. Department of Labor Contractor Registration and New Jersey Business Registration Certificate are required for all Subcontractors.

5.1.2 If the DPMC has objection to any proposed or approved Subcontractor and/or material supplier, the Contractor shall substitute another Subcontractor and/or material supplier acceptable to DPMC. Under no circumstances shall the State be obligated for additional cost due to such substitution.

5.1.3 After the acceptance of bids, the Contractor shall make no substitution of any Subcontractor person or firm previously selected and approved, without prior written approval from the Architect/Engineer and DPMC. A Contractor seeking to substitute a Subcontractor person or firm shall provide written request for substitution no less than fourteen (14) calendar days prior to the execution of Work by the Subcontractor or material supplier.

5.1.4 Approval of a Subcontractor or material supplier by the DPMC and Architect/Engineer shall not relieve the Contractor of the responsibility of complying with all provisions of the Contract Documents. The approval of a Subcontractor or material supplier does not imply approval of any construction, material, equipment or supplies.

5.2 CONTRACTOR-SUBCONTRACTOR RELATIONSHIP

5.2.1 The Contractor acknowledges its full responsibility to the State for the acts and omissions of its Subcontractors and lower tier subcontractors, and of persons and firms either directly or indirectly employed by them, equally to the extent that the Contractor is responsible for the acts and omissions of persons and firms directly or indirectly employed by it. The Contractor acknowledges that it remains fully responsible for the proper performance of its Contract regardless of whether work is performed by the Contractor's own forces or by Subcontractors engaged by the Contractor.

5.2.2 Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and the State. Further, no Subcontractor or material supplier shall be deemed an intended third party beneficiary under this Contract.

5.2.3 The Contractor and all Subcontractors agree that, in the employment of both skilled and unskilled labor, preference shall be given to residents of the State of New Jersey, if such labor force is available.

5.2.4 The Contractor shall require, in its agreements with Subcontractors and as a condition of agreement, that each Subcontractor require in its agreement(s) with lower tier Subcontractors and Suppliers, that the Subcontractor understands that there is no contractual obligation of any kind between the State and Subcontractor and the Subcontractor's sole recourse lies with the Contractor and/or the surety, and not with the State, that each Subcontractor and lower tier Subcontractor, bound by the terms of the Contract Documents for this Contract, and assume toward the Contractor all the obligations and responsibilities which the Contractor assumes, pursuant to the Contract Documents.

ARTICLE 6 - CONSTRUCTION PROGRESS SCHEDULE

6.1 GENERAL

The State may contract for the services of a Critical Path Method (CPM) scheduling consultant for Project planning, scheduling and cost control. If such has been arranged, then section 6.2 shall apply to the Contract between the State and the Contractor. In the absence of a statement in the bid documents that a CPM consultant has been retained by the State, then section 6.3 shall apply.

6.2 CONSTRUCTION PROGRESS SCHEDULE (CRITICAL PATH METHOD -- CPM CONSULTANT RETAINED BY THE STATE)

6.2.1 Critical Path Method

- a. The Project will be monitored by a detailed critical path method scheduling system. This system shall be the basis for the evaluation of the Contractor's performance and for progress payments to the Contractor.
- b. The Contractor shall provide all the information necessary for the CPM consultant employed by DPMC to develop a CPM network plan demonstrating complete fulfillment of all construction Contract requirements and, as necessary, for the CPM consultant to maintain an accurate CPM schedule throughout the Project. The Contractor, in consultation with the CPM consultant, will establish construction logic and activity time duration consistent with Contract documents and Project requirements. The CPM consultant will establish the level of detail to be reflected on the CPM schedule. The Contractor shall utilize the schedule in planning, coordinating and performing the Work, including all activities of Subcontractors, equipment vendors and material suppliers.
- c. The Contractor agrees that the CPM consultant's Project network schedule is the designated plan for completion of all work in the allotted time, and the Contractor will assume full responsibility for the execution of the Work as shown. The Contractor shall indicate formal acceptance of the schedule by signing the final initial (baseline) network diagrams and computer schedule listing.
- d. The Contractor shall furnish sufficient labor and construction equipment to ensure the execution of the Work in accordance with the approved CPM progress schedule. If, in the opinion of the DPMC, a Contractor falls behind the CPM progress schedule, the Contractor shall take any and all such steps as may be necessary to bring its work into compliance with the CPM progress schedule. The DPMC may require the Contractor to increase the number of shifts, days of work and/or the amount of construction labor, plant and equipment, all without additional cost to the State.
- e. The Contractor shall make no claim for, and have no right to, additional payment or extension of time for completion of the Work, or any other concession because of any misinterpretation or misunderstanding on the Contractor's part of the CPM progress schedule, the Contractor's failure to attend the pre-bid

conference, or because of any failure on the Contractor's part to become fully acquainted with all conditions relating to the CPM progress schedule and the manner in which it will be used on the Project, or because of any Subcontractor's failure to properly participate in the development of a CPM progress schedule or to perform the Contract in accordance with the CPM progress schedule.

6.2.2 Initial Submittal

a. To the extent necessary for the CPM consultant to reflect in the network diagrams the plan for completion of this Contract, the Contractor shall meet with and assist the CPM consultant and furnish, within ten (10) calendar days after award of this Contract, all necessary information for the preparation of the CPM progress schedule. This information shall include, but not necessarily be limited to, a logical sequencing of work operations, activity time estimates, intended crew flow, activity costs and estimated manpower requirements for each activity.

(1) The network diagram shall show the sequence and interdependence of activities required for the Project. In preparing the network diagram, the Contractor shall assist the CPM consultant by breaking up the Work into activities of a duration of no longer than ten (10) working days each, except as to non-construction activities (such as procurement of materials, delivery of equipment and concrete curing) and any other activities for which the CPM consultant may approve the showing of longer duration. The diagram shall show not only the activities for actual construction but also such activities as the Contractor's submittal of shop drawings, templates and equipment, material fabrication, delivery of equipment and material, substantial completion, final completion, punch list and closeout, and the delivery of Owner-furnished equipment, if applicable. The Contractor shall provide activity durations to the CPM consultant for each activity on the diagram.

(2) If requested by the CPM consultant, the Contractor shall furnish any information needed to justify the reasonableness of activity time duration. Such information shall include, but not be limited to, estimated activity manpower, unit quantities, and production rates.

(3) Failure by either the Contractor or the CPM consultant to include any element of work required for the performance of the Contract shall not excuse the Contractor from completing all work required within any applicable date, notwithstanding DPMC approval of the network diagrams.

(4) The CPM consultant will establish the level of detail to be reflected in the CPM system.

(5) Seasonal weather conditions shall be considered in the planning and scheduling of all work influenced by high or low ambient temperatures for the completion of all Contract work within the allotted Contract duration. In addition, appropriate allowances shall be made for anticipated time losses due to normal rain and snow conditions based on

the previous five year average for that geographical area, by statistically expanding the estimated time duration for weather-sensitive activities, to ensure that the required completion date is achieved.

b. The Contractor shall be prepared to meet as many times as necessary with the CPM consultant to develop the information required for the timely development of the progress CPM schedule.

c. The Contractor shall furnish a breakdown of its total Contract price by assigning dollar values to each applicable network activity, coded for the Contractor and each Subcontractor, which cumulatively equals the total Contract amount. Upon acceptance by DPMC, the values will be used as a basis for determining progress payments. Progress payments to the Contractor shall be dependent upon final acceptance by DPMC of the cost-loaded progress CPM schedule.

d. Accompanying the network diagram and computer scheduling listing, the CPM consultant will furnish a computer-generated cost requisition listing, which will provide a separate tabulation of each activity shown on the CPM schedule in order of bid item or trade responsibility code as agreed to by DPMC. This listing will show, for each activity, the Contractor and each Subcontractor, the estimated dollar value of Work in place for totally or partially completed activities, including subtotals by bid items and grand totals for the entire Project. The cost requisition listing will also contain monthly activities reflecting the cost of Project overhead and administrative expenses, and activities reflecting the monthly cost of administering Project General Conditions.

6.2.3 Review and Approval:

a. After receipt of the initial network diagram, computer-produced schedule and cost requisition listing, the DPMC representative shall meet with the Contractor and CPM consultant for joint review, correction, or adjustment of the proposed plan and progress CPM schedule to evaluate the cost values assigned to each activity. Within ten (10) calendar days after the joint review, the CPM consultant will revise the network diagram and/or computer-produced schedule in accordance with agreements reached during the joint review, and shall submit two (2) copies each of the revised network diagram, computer-produced schedule and cost requisition listing to DPMC. The revised schedule documents will be reviewed by DPMC and, if found to be as agreed upon, will be approved. A copy of each will be returned to the CPM consultant for distribution and the CPM consultant shall forward same to the Contractor by email and/or overnight mail. The Contractor shall review these documents and shall indicate acceptance by signing the schedule documents. If the Contractor objects to the schedule documents, the Contractor shall forward these objections in writing to DPMC within ten (10) calendar days of the date of receipt of same or be deemed to have accepted the schedule documents. Objections shall include the precise activities of the schedule to which the Contractor objects and identify the basis of the objection. The Contractor will then meet with the DPMC representative and the CPM consultant to review the Contractor's objections. The CPM consultant may

revise the network diagram and the computer-produced schedule in accordance with the agreements reached during this final review and shall submit two (2) copies each of the revised network diagram, computer-produced schedule and cost requisition listing to DPMC. The re-submission will be reviewed by DPMC and, if found to be as agreed upon, will be approved and a copy of each will be returned to the CPM consultant for distribution and the CPM consultant shall forward same to the Contractor by email and/or overnight mail. The Contractor shall review these schedule documents to ensure that that the documents reflect all changes agreed upon, accept and sign. The Contractor shall indicate its acceptance by signing the scheduling documents, computer-produced schedule and cost requisition. Approval will be without reservation, and the Contractor will be deemed to have accepted the schedule as adequate, proper and binding in all respects and shall not raise further objections to the schedule.

b. After the network diagrams and computer-produced schedule have been signed by the Contractor, the CPM consultant shall forward to the Contractor and DPMC one set of copies of the network diagrams and computer-produced schedule. The network diagram and the computer-produced schedule with approved signatures shall constitute the Project work schedule until subsequently revised in accordance with the requirements of this section.

6.2.4 Progress Reporting and Changes:

a. Once every month, or more often if required by DPMC, the Contractor shall meet with the CPM consultant and DPMC's representative(s) and provide the information necessary for the CPM consultant to prepare and submit to DPMC a revised (updated) network diagram and computer-generated schedule listing showing:

- (1) Approved changes in activity sequencing;
- (2) Changes in activity duration for activities not started or partially completed where agreed upon;
- (3) The effect on the network of any delays in any activities in progress, and/or the impact of known delays which are expected to affect future work;
- (4) The effect of Contractor modifications (activity duration, logic and cost estimates) to the network;
- (5) Changes to activity logic, where agreed upon, to reflect revision in the Contractor's work plan, i.e., changes in activity duration, cost estimates, and activity sequences for the purposes of regaining lost time or improving progress; and
- (6) Changes to milestones, due dates, and the overall Contract completion date which have been agreed upon by DPMC since the last revision of the CPM schedule.

b. The CPM schedule shall accurately reflect the manner in which the Contractor intends to proceed with the Project and shall incorporate the impact of

all delays, Change Orders and change events as soon as these factors can be defined. All changes made to the schedule shall be subject to approval by DPMC prior to inclusion in the CPM schedule. If the DPMC representative and the Contractor are unable to agree as to the amount of time to be allowed for Change Order work, or the manner in which the Work is to be reflected on the network diagram, the CPM consultant will reflect the logic and time duration furnished by the Contractor for the Change Order work pending final DPMC decision. If non-approved Contractor logic and time durations are used, the Contractor agrees that any time which is projected to be lost on the Project as a result of these schedule changes will be considered the responsibility of the Contractor until a final agreement has been made or a final decision rendered by DPMC regarding the manner in which the Change Order work is to be reflected on the schedule. When this final decision has been made by DPMC, the CPM consultant shall revise the CPM schedule in accordance with such decision and issue a final analysis of the effect of the change on the Project.

c. If the Contractor desires to revise the logic of the approved progress CPM schedule to reflect a sequence of construction that differs from that to which was previously agreed, the Contractor must first obtain the approval of DPMC.

(1) Once each month, at the same time the network is updated, the CPM consultant, the Contractor and the DPMC representative(s) shall jointly make entries on the preceding network diagram schedule to show actual progress, identify those activities started by date and those completed by date during the previous period, show the estimated time required to complete each activity started but not yet completed, show activity percent completed and/or dollars earned, and reflect any changes in the network diagram approved in accordance with the preceding paragraph. After completion of the joint review and DPMC's approval of all entries, the CPM consultant will submit updated network diagrams, an updated computer-produced calendar-dated schedule and cost requisition listing to DPMC.

(2) The resultant monthly CPM computer printout and network diagrams shall be recognized by the Contractor as its sole updated construction schedule to complete all remaining Contract work.

(3) In addition to the foregoing, once each month the Contractor will receive a narrative report prepared by the CPM consultant. The narrative report will include a description of the amount of progress made during the last month in terms of completed activities in the plan currently in effect, a description of problem areas, current and anticipated delaying factors and the estimated impacts the delays have on the performance of other activities and completion dates, and recommendations on corrective action for the Contractor. Within seven (7) calendar days after receipt of this report, the Contractor shall submit to DPMC a written explanation of corrective action taken or proposed. The DPMC, after reviewing the written submission, may take appropriate action.

6.2.5 Payments to Contractor

- a. The monthly submission of the computer-produced calendar-dated schedule shall be an integral part and basic element of the estimate upon which progress payments shall be made pursuant to the provisions of Article 9 of these General Conditions. The Contractor shall be entitled to progress payments only upon receipt by DPMC of an updated computer-produced calendar-dated schedule and cost requisition listing.
- b. Payments to the Contractor shall be based upon the results of the computer-generated cost requisition listing which shall be prepared in conjunction with each updating of the CPM system as described above. The Contractors shall provide sufficient documentation to confirm reported progress for any cost items appearing in the scheduling and requisition system.
- c. Payments to the Contractor shall be dependent upon the Contractor furnishing all of the information which, in the judgment of DPMC, is necessary to ascertain actual progress, and all the information and data necessary to prepare any necessary revisions to the computer-produced calendar-dated schedule, cost requisition listing and/or the network diagram. DPMC's determination that the Contractor has failed or refused to furnish the required information shall constitute a basis for withholding payments until the required information is furnished and the schedule and/or diagram is prepared or revised on the basis of such information.

6.2.6 Biweekly Progress Meetings

- a. Every two (2) weeks or as otherwise directed by DPMC, the Contractor shall attend a coordination and CPM scheduling meeting on the job site. At this meeting, the Contractor shall provide detailed information regarding the Work schedule to be performed during the upcoming two weeks to permit the CPM consultant to prepare schedules for the subsequent two week period. Biweekly scheduling by the Contractor shall be in accordance with the priorities and degree of concurrent work required by the official CPM schedule for the Project. The Contractor shall be prepared to explain any difference between the Contractor's biweekly schedules and the priorities required by the latest updating of the official CPM schedule.
- b. At the biweekly scheduling meeting, the CPM consultant shall review the schedule for the preceding two (2) weeks, and the Contractor shall report the progress actually achieved for each activity which was scheduled to be performed during the two weeks, including the actual dates on which the Work was performed. The Contractor agrees that this information shall constitute the official historical record of Project progress.
- c. At each biweekly scheduling meeting, the Contractor shall document any current delays to work operations. In addition, the Contractor shall provide any available information regarding any potential delays.
 - (1) Following the biweekly scheduling meeting, the CPM consultant will issue to the Contractor a two-week look-ahead schedule as developed

at the meeting that shall constitute the construction schedule for the coming two weeks. The CPM consultant will also issue a narrative biweekly progress analysis documenting progress achieved during the preceding two weeks and analyze delays reported to constitute current or anticipated impacts to timely construction.

(2) The Contractor shall be represented at the biweekly scheduling meeting by its superintendent, who shall have complete authority to provide the information required for the development of the next two (2) weeks schedule, which includes documentation of past progress and documentation of delays. The Contractor's representatives shall also be authorized to commit to the implementation of corrective action planned to overcome delaying conditions.

6.2.7 Responsibility for Completion

a. The Contractor agrees that, when it becomes apparent from the current project CPM schedule that any Contract completion date will not be met, the Contractor will take any or all of the following actions, as required, at no additional cost to the State:

- (1) Increase construction manpower.
- (2) Increase the number of working hours per shift, shifts per working days, working days per week, or the amount of construction equipment, or any combination of the above; and/or
- (3) Reschedule activities to achieve maximum practical concurrence.

6.2.8 Adjustment of Contract Completion Date

a. The Contract completion dates will not be adjusted except under the specific and limited conditions set forth in the Contract Documents. In the event that the Contractor requests an extension of any Contract completion date, the Contractor shall furnish a justification of such extension and provide any and all supporting evidence that DPMC requires to evaluate the Contractor's request. The DPMC shall either approve, in whole or in part, or reject the Contractor's request and will advise the Contractor in writing of its decision. If the DPMC finds that the Contractor is entitled to any extension of any Contract completion date under the provisions of this Contract, the determination as to the total number of calendar days extension permitted shall be based upon the currently approved Project CPM schedule and on all data relevant to the extension request. Such data will be included in the next updating of the CPM schedule.

b. The Contractor acknowledges and agrees that the evaluation of Project delays and determinations regarding Project time extension will be based upon the Project CPM schedule and the following criteria:

- (1) Float time shown on the Project CPM schedule is not for the exclusive use of either the Contractor or DPMC. It is agreed that float time is available for use by all performing Work on the Project, including the Contractor, other contractors, subcontractor, lower tier subcontractors,

and suppliers to facilitate the effective use of available resources and to minimize the impact of problems of Change Orders which may arise during construction. The Contractor specifically agrees that float time may be used by DPMC or its representatives or consultants in conjunction with the review activities or to resolve Project problems. The Contractor agrees that there will be no basis for a Project time extension as a result of any Project problem, Change Order or delay which only results in the loss of available positive float on the Project CPM schedule. The Contractor further agrees that there will be no basis for a claim for cost escalation for any activity which is completed on or before its initially required late end date as shown on the initial approved Project CPM schedule, regardless of the justifiability or any delaying factors which might have resulted in the elimination of float which was originally available for the activity. If the Contractor refuses to perform work that is available to it, the DPMC may consider, the Contractor to be in breach of the Contract, regardless of the float shown to be available for the Work. In such instances, the DPMC may, without prejudice to any other right or remedy, declare the Contractor to be in default and terminate the employment of the Contractor pursuant to Article 12 of the General Conditions.

(2) The Contractor agrees that no time extension will be granted for time lost due to normal seasonal weather conditions. In order to qualify for consideration for a time extension due to adverse weather conditions, it must be shown by clear and convincing evidence that the weather conditions during a given quarterly period (summer, fall, winter, spring) were more severe than the previous five-year (5) average for the Project geographical area, and that these weather conditions critically impacted the final Project completion date by delaying the performance of work on the main Project critical path. If abnormal weather losses can be shown to have affected the Project critical path, a non-compensable time extension will be considered for that portion of the proven weather-related delays, which exceeded normal weather losses that should have been anticipated for the quarterly period in question.

(3) No time extensions will be considered for any weather conditions that do not affect work on the Project critical path as set forth on the current Project CPM schedule. The Contractor agrees that there will be no basis for a claim for any additional compensation resulting from any time extension issued for weather-related delays.

(4) In order for a given cause (i.e., delay, Change Order, etc.) to be considered as a basis for a total Project time extension, it must meet both of the following criteria:

- (a) It must be totally beyond the control of the Contractor and due to no direct or indirect fault of the Contractor; and
- (b) It must result in a direct delay to work on the main Project critical path.

(5) The Contractor acknowledges and agrees that actual delays to activities that, according to the Project CPM schedule, do not directly affect the main Project critical path and do not have any effect on the Contract completion date or dates, will not be the basis for a change therein.

(6) Concurrent delays are defined as two or more delays or areas of work slippage that are totally independent of one another and which, if considered individually, would each affect the final Project completion date according to the Project CPM schedule. Where the CPM consultant determines that concurrent delays exist, the Contractor acknowledges and agrees that the following criteria will be used to evaluate time extension:

- (a) If the current Project CPM schedule shows two (2) or more concurrent delays, with one analyzed to be the responsibility of DPMC and the other analyzed to be the responsibility of the Contractor, a non-compensable time extension will be considered only if the excusable delay affects the main Project critical path and this delay is shown to be a greater amount than the other concurrent delays when the impacts of the concurrent delays are independently considered. In this event, a compensable time extension will be considered only for that portion of time by which the excusable delay exceeds all concurrent non-DPMC caused delays. For example, if an excusable impact delays the Project by one-hundred (100) calendar days and concurrent contract-caused slippage independently delays the final completion date by ninety (90) calendar days, a time extension will only be considered for a maximum of ten (10) calendar days, provided the excusable delay is on the project critical path.
- (b) If the CPM schedule shows concurrent delays with some excusable delays and some the fault of the Contractor, and if the Contractor-caused delays are analyzed to be the main determining impact to the main Project critical path, then there will be no basis for a total Project time extension regardless of the nature of the concurrent excusable delays. A concurrent time extension may, however, be considered for that portion of the total Project slippage which is shown on the CPM schedule to be totally attributable to excusable delays.
- (c) If a time extension request is being made for concurrent delays which did not affect the Project critical path, this must be clearly stated in the Contractor's time extension request and all CPM activities which are claimed to have been affected by the cited delay must be specifically identified with all applicable impact dates.

6.3 CONSTRUCTION PROGRESS SCHEDULING PROVIDED BY THE CONTRACTOR

6.3.1 The Project shall be completed within the specified number of calendar days from the effective date of the Notice to Proceed.

6.3.2 The Contractor shall be responsible for preparing and furnishing to the DPMC through the Architect/Engineer before the first Contract requisition date, but in no event later than 30 (thirty) days after the effective date of the Notice to Proceed, a coordinated combined progress schedule that incorporates the progress schedules of the Contractors and all Subcontractors engaged on the Project. The schedule shall be in the form of a network diagram or other recognized graphic critical path progress schedule format that indicates, among other things, predecessor and successor activities, and major and intermediate milestones, in sufficient detail to satisfy the DPMC. (See also section 6.3.4 below.) The Contractor's initial invoice will not be processed by the DPMC until and unless such a single coordinated progress schedule has been submitted to and approved by the DPMC. Thereafter, the Contractor shall submit an updated coordinated progress schedule on a monthly basis. Receipt and approval of the updates will be a mandatory condition to payment.

6.3.3 Once each month, or more often if required by the DPMC, the Contractor shall meet with the Architect/Engineer and the DPMC representative to gather the information necessary for the Contractor's preparation of the revised/updated computer generated scheduling reports.

6.3.4 The progress schedule, based upon the logic and time estimates, shall indicate in suitable detail for display, all significant features of the Work of the Contractor and each Subcontractor, including but not limited to, the placing of orders, manufacturing durations, anticipated delivery dates for critical and long-lead items, submissions and approvals of shop drawings, construction activities, all work activities to be performed by the Contractor and its Subcontractors, the beginning and time duration thereof, and the dates of all milestones, substantial and final completion of the various elements of the Work, including punch list and close-out. Reports shall be in booklets, indexed and separated as categorized below. Each activity listed on the Schedule shall include, as a minimum, the following:

- a. The activity description;
- b. The trade (A/E, Owner, GC, Electrical, Plumbing, HVAC);
- c. The duration in calendar days;
- d. The Early Start date;
- e. The Late Start Date;
- f. The Early Finish date;
- g. The Late Finish date;
- h. The Total Float

6.3.5 The Contractor agrees that no time extension will be granted for time lost due to normal seasonal weather conditions. In order to qualify for consideration for a time extension due to adverse weather conditions, it must be shown by clear and convincing evidence that the weather conditions during a given quarterly period (summer, fall, winter, spring) were more severe than the previous five-year (5) average for the Project geographical area, and that these weather conditions critically impacted the final Project completion date by delaying the performance of work. If abnormal weather losses can be shown to have impacted the Project completion date, a non-compensable time extension will be considered for that portion of the proven weather-related delays, which exceeded normal weather losses that should have been anticipated for the quarterly period in question.

6.3.6 Immediately upon approval by DPMC, the Contractor shall prepare and distribute four copies of the progress schedule to the DPMC plus two copies to the Architect/Engineer. Each monthly updated coordinated schedule shall be signed and dated by the Contractor.

6.3.7 The Contractor shall furnish sufficient labor and construction plant and equipment to ensure the execution of the Work in accordance with the approved progress schedule. If any updated completion time or date for any activity does not conform to the durations or milestones shown in the approved progress schedule, the sequence of activities and/or the time for performance of activities shall be updated on the progress schedule to be approved by the DPMC and cured by the Contractor by any means, including performing concurrent operations, additional manpower, additional shifts, and overtime. No additional charges to the State will be allowed the Contractor for overtime, additional manpower, equipment, additional shifts, etc. (except as may be provided elsewhere in the Contract), if such expediting procedures or measures are necessary to meet the Contract completion date.

6.3.8 The progress schedule shall show:

- a. Recommended Changes in activity sequencing;
- b. Changes in activity duration for activities not started or partially completed, where agreed upon;
- c. The effect on the network of the modifications (activity duration, Predecessors and Successors);
- d. Changes for the purposes of regaining lost time or improving progress, and;
- e. Changes to milestones, due dates, and the overall Contract completion date, which have been agreed upon by the DPMC's project manager since the last revision of the progress schedule.

6.3.9 The progress schedule shall accurately reflect the manner in which the Contractor intends to proceed with the Project and shall immediately incorporate and reflect the impact of all delays and change orders. All changes made to the schedule shall be subject to approval by the DPMC.

6.3.10 The DPMC will not authorize or approve any claims for additional payment or extension of time for completion of the Work, or any other concession because of any alleged misinterpretation or misunderstanding on the Contractor's part of the Project schedule, the Contractor's failure to attend the pre-bid conference, because of any failure on the Contractor's part to become fully acquainted with all conditions relating to the Project schedule and the manner in which it will be used on the Project, or because of any other failure by the Contractor to properly participate in the development of a progress schedule or to perform the Contract in accordance with the progress schedule.

ARTICLE 7 - TIME OF COMPLETION

7.1 CONTRACT DURATION/NOTICE TO PROCEED

7.1.1 Contract duration shall commence on the effective date set forth on the written Notice to Proceed. The Notice to Proceed will be issued by the DPMC after the DPMC's receipt and acceptance of properly executed Contract Documents, including performance and payment bonds, proof of insurance and permit technical information submitted by the Contractor and/or Subcontractors. The Contractor shall not be entitled to delay, disruption, acceleration or any other claims arising from a deferred issuance of the Notice to Proceed.

7.1.2 The Contractor shall perform no work at the Contract Site prior to the issuance of the Notice to Proceed.

7.2 SUBSTANTIAL COMPLETION

7.2.1 At the request of the Contractor, the Architect/Engineer or the DPMC, the Contractor and the DPMC representative may make a joint inspection of the Work for the purpose of determining if the Work is substantially completed in accordance with the definition provided in Article 1. If DPMC, in its sole discretion, finds that the Work is substantially complete, then the DPMC will issue a written Notice of Substantial Completion for Beneficial Use. Such Notice shall in no way relieve the Contractor of any contractual obligation(s) or relieve the Contractor from responsibility to promptly complete all remaining Contract Work including, but not limited to, punch list items.

7.2.2 The standard guarantee period for equipment, workmanship and materials shall commence on the date DPMC issues the Notification of Substantial Completion for Beneficial Use, or from the time of completion and acceptance of equipment, work or materials in question, whichever is later.

7.2.3 In the event that the Project is completed in phases or stages, and/or in the event that the DPMC takes possession of any part of the Work pursuant to Section 7.4 of these General Conditions, no part of the Project shall be deemed substantially complete for purposes of the New Jersey Statute of Repose, N.J.S.A. 2A:14-1.1, prior to the issuance of a formal Notice of Substantial Completion for Beneficial Use for the all of the Work.

7.3 FINAL COMPLETION

7.3.1 Final completion of the Contract shall occur when:

- a. The DPMC and the Architect/Engineer have determined that the punch list has been completed;
- b. The Contractor has complied with the Contract Document's closeout requirements;
- c. The Contractor has submitted all Contract deliverables as required by the Contract Documents including but not limited to the following: "as-built"

documents, operating and maintenance manuals, attic stock, parts lists, repair source lists, training and certificates; and

d. The Contractor has submitted all warranties, guarantees and/or maintenance bonds required under the Contract.

7.4 PARTIAL OCCUPANCY FOR USE

7.4.1 Use and possession prior to completion: The DPMC shall have the right to take possession or use of any completed or partially completed part of the Project. Said possession or use shall not be deemed acceptance of the Work performed on the Project.

7.4.2 Prior to such possession or use, the DPMC shall furnish the Contractor with an itemized list of Work remaining to be performed or corrected on such portions of the Project that are to be possessed or used by the State. Failure by the DPMC to list any item of work shall not be deemed an acceptance of any Work under the Contract.

7.4.3 The Contractor shall not be entitled to recovery of money damages for any delays, disruptions or inefficiencies caused by such partial occupancy.

7.5 DELAY, DISRUPTION AND INTERFERENCE

7.5.1 Delay - Time Extension. If the Contractor's work is delayed, disrupted or interfered with by act, neglect or default of any party, including the State, the Architect/Engineer, or by strikes, lockouts, fire, unusual delay by common carriers, natural disasters, or by any cause for which the Contractor is not responsible; then for all such delays and suspensions, the Contractor shall be allowed one (1) calendar day addition to the time herein stated for each and every calendar day of such delay so caused in the completion of the Work as specified above, the same to be determined by the DPMC. No such extension shall be granted for any delay unless, within ten (10) calendar days after the beginning of such delay, a written request for additional time shall be filed with the DPMC.

7.5.2 Contractor's Damages for Delay, Disruption or Interference

The Contractor shall not be entitled to recovery of money damages from the DPMC caused by delay, disruption or interference with the Contractor's Work except as expressly provided under section 7.5.2 of these General Conditions paragraph. The Contractor expressly agrees that the Contractor's remedy for delay, disruption or interference shall be limited to an extension of time only and that there shall be no recovery of money damages by the Contractor for any delay, disruption or interference with the Contractor's work attributable to any cause whatsoever (other than the State's negligence, bad faith, active interference or other tortuous conduct). The Contractor expressly agrees that it shall not be entitled to recover damages due to delay, disruption or interference caused by any of the following:

- a. Delayed execution of the contract or any of the causes referenced in paragraph 7.5.2;
- b. Any act or omission by any party other than the State, including, but not limited to, the Architect-Engineer, any other Contractor or Subcontractor, any

CPM or other consultant retained by the State, any construction manager retained by the State, any agency or instrumentality of the federal government or of any local governmental entity or any utility (e.g., gas, electric, telephone, cable);

- c. Any act or omission of any agency or instrumentality of the State, other than the DPMC, including, without limitation, the Department of Environmental Protection and the Department of Community Affairs;
- d. Weather;
- e. Subsurface conditions of any type including, without limitation rock and underground utilities, whether or not such conditions were reasonably ascertainable to the Contractor at the time of bidding;
- f. Use of all or any portion the Project premises prior to completion of the Work to the extent that such use is permitted under the terms of the Contract;
- g. Delay in obtaining any permit or approval;
- h. Delay caused by the issuance of any court order, injunction or restraining order;
- i. Any delay which does not entitle the Contractor to an extension of the Contract Completion Time under Section 6.2.8 of these General Conditions; or
- j. Delay attributable to any other cause, other than a cause for which the State is legally restricted from enforcing a contractual "no damage for delay" clause under N.J.S.A. 2A:58B-3 or any other provision of law restricting or barring the enforcement of such clauses.

In interpreting this provision, the negligence or other wrongful conduct of others, including, without limitation, the Architect/Engineer, the CPM consultant, any construction management firm and any other firm or person retained by the State shall not be imputed to the State. Further, to the extent that the Contractor is entitled to recover monetary damages for delay under this Contract, such recovery shall be limited to actual direct costs incurred on account of the delay, and shall not include profit or other markup on such costs, home office overhead calculated under the Eichleay formula or any other kind of consequential or indirect cost or damage, including but not limited to any alleged cost or damage under the total cost method, the modified total cost method, or productivity factors (costs for inefficiency based on industry productivity factors such as those provided by the Mechanical Contractors Association of America (MCAA) Factors Affecting Labor Productivity).

7.5.3 In the event of the failure of the Contractor to complete its work within the time stated in its Contract, the Contractor shall be liable to the State in the sum as set forth as liquidated damages in the Contract, for each and every calendar day that the Contractor fails to attain contract completion of the work. This sum shall be treated as liquidated damages to compensate for the loss to the State of the use of premises in a completed state of construction, alteration or repair, and for added administrative and inspection costs to the State on account of the delay; provided, however, that the said liquidated damages shall be in addition to other compensatory or consequential losses or damages

that the State may incur by reason of such delay, such as, but not limited to, added costs of the Project and the cost of furnishing temporary services, if any. Any such sums for which the Contractor is liable may be deducted by the State from any moneys due or to become due to the Contractor.

7.5.4 It is hereby understood and mutually agreed by and between the Contractor and the State that the start date in the Notice to Proceed, the dates of all required intermediate milestones, and the times for substantial and final completion, as specified in the Contract Documents, are essential conditions of this Contract.

7.5.5 The Contractor agrees that said work shall be executed diligently, at such rate of progress as will ensure full completion of the Work within the time specified. It is expressly understood and agreed, by and between the Contractor and the State, that the time for the completion of the Work herein is a reasonable time, taking into consideration the average climactic range and usual industry conditions prevailing in this locality. If the said Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extension thereof granted by the DPMC, then the Contractor does hereby agree, as a part of the consideration for the awarding of its Contract, to pay the State the amount specified in section 7.5.3 above, as liquidated damages for loss of use of the Project as hereinafter set forth, for each and every calendar day that the Contractor may have exceeded the stipulated date in the Contract for substantially completing the Work.

7.5.6 It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any Work, the new time limit fixed by such extension shall similarly be of the essence.

ARTICLE 8 - CLOSE-OUT

8.1 CLOSE-OUT PROCEDURES/FINAL PAYMENT

As part of the final completion procedures described in Article 7 and the requirements for payment as described in Article 9, the Contractor must complete all of the Close-out procedures as follows:

- a. Submit the “as-built” record documents as described in Article 4;
- b. Submit all operating and maintenance manuals, parts lists, repair source parts, and certificates as defined in 8.2 below;
- c. Provide the necessary training for operating systems and equipment as defined in 8.3 below; and
- d. Submit all guarantees as defined in 8.4 below.

8.2 OPERATIONS, EQUIPMENT AND MAINTENANCE MANUALS

8.2.1 The Contractor shall provide six (6) copies of all operating, equipment and maintenance manuals, and applicable warranties, as identified and described in the Contract Documents. The operating, equipment and maintenance manuals and warranties, including contact personnel, addresses and telephone numbers, must include a complete description of all systems and equipment and the method of operating and maintaining the equipment. These manuals must be submitted to the Architect/Engineer for review and approval at the earliest date possible following substantial completion, but in all cases prior to final acceptance. Included within the manuals shall be a list of names, addresses and telephone numbers of all the Subcontractors involved in the installations and of firms capable of performing services for each mechanical item.

8.2.2 As a pre-condition to the Final acceptance of a facility for beneficial use, the Contractor shall provide a "throw-away" copy of operations and maintenance manuals to allow the Using Agency's staff to operate the equipment prior to receiving the hard bound copies required by this Contract.

8.3 TRAINING

The Contractor shall provide formal instruction for DPMC-designated personnel, addressing the operation and maintenance of the facilities and all installed equipment for each operating system or major item of equipment or as otherwise specified. The operations and maintenance manuals shall be used as training materials. Unless otherwise accepted by the DPMC, training course format shall be split equally between classroom instruction and field exercise. All classroom instruction may be videotaped by the DPMC. Classroom instruction may be supported by professionally made videotapes. If used, a copy of each professional video that was utilized shall be provided to the DPMC at no cost for future training and reference.

8.4 GUARANTEE

8.4.1 The issuance of a final certificate for payment and/or partial or complete occupancy of the premises shall not be deemed an acceptance of Work not completed in accordance with the Contract Documents. The issuance of a final certificate for payment and/or partial or complete occupancy of the premises shall not relieve the Contractor or its surety of liability with respect to any express or implied warranties or responsibility for faulty materials or workmanship.

8.4.2 The Contractor shall guarantee and warrant, in writing, the Work performed and all materials furnished under this Contract against defects in materials and/or workmanship. The Contractor shall be responsible for the value or repair of any damage to other Work or to the building premises resulting from the performance of the Contract.

8.4.3 The Contractor is responsible for the above-stated obligations for a period of one (1) year from the date established in 7.2.2 above. All guarantees, including bonds and registrations, required by the Contract Documents shall be in writing and delivered to the DPMC with submission of the invoice for final payment.

8.4.4 The Contractor shall, at its own expense and without cost to the State, promptly after receipt of written notice thereof, make good any defects in materials or workmanship which may develop during stipulated guarantee periods, as well as any damage to other Work caused by such defects or by repairs. Any other defects in materials or workmanship not discovered during the guarantee period shall be repaired and/or replaced at the Contractor's expense, and such shall be completed within a reasonable time after written notice is given to the Contractor.

8.4.5 Pursuant to the Contract Documents, certain permanent equipment, including elevators and HVAC systems, will have to be activated during construction of the Project to support construction operations. Despite any early activation during the construction of the Project, any and all equipment warranties must extend for the time periods required in the Contract Documents, starting at the date set forth in paragraph 7.2.2.

8.4.5 It is expressly acknowledged and agreed that the express and implied warranties and guarantees to which the State is entitled as well as all warranty and guarantee bonds issued by any surety, shall be in addition to and not in lieu of the State's right to seek recourse against the Contractor and the Contractor's surety for defective work.

ARTICLE 9 - PAYMENTS

9.1 INVOICES

9.1.1 Requests for payment under the Contract for materials delivered or services rendered require the proper completion and submittal of specific forms including, but not limited to, the following:

- a. DPMC Form 11/AR50-1 - DPMC Invoice;
- b. DPMC Form 11-2 - Monthly Estimate for Payment to Contractor;
- c. DPMC Form 11-2a - Certification of Prime Contractor;
- d. DPMC Form 11-2b – Certification of Subcontractor;
- e. Copies of Subcontractor(s) invoices;
- d. DPMC Form 11-3 - Prime Contractors Summary of Stored Materials;
- e. DPMC Form 11-3A - Agreement and Bill of Sale Certification for Stored Materials;
- f. Consent of Surety forms;
- g. Certified Payroll Records;
- h. Updated project schedule
- i. Any other information or documentation required by other provisions of the Contract documents.

9.1.3 The Contractor shall submit the completed request for payment on a monthly basis for all properly completed billable work to the DPMC Project representative and at the address identified at the pre-construction conference.

9.1.4 One (1) original and one (1) copy of the request for payment packets shall be prepared and submitted unless otherwise specified.

9.1.2 No request for payment shall be deemed to be formally submitted and received for payment until all dollar amounts and completion percentages for each line item in the invoice has been determined and agreed upon by the State and the Contractor.

9.1.5 For the purpose of the State's Prompt Payment Act (N.J.S.A. 2A:30A-1 et seq.):

- a. A proper invoice will be deemed to have been received by the owner when it is received by the person or entity designated by the State to review and sign the invoice on the State's behalf at the address designated in the pre-construction conference for receipt of invoices. Receipt of an invoice by such person or entity shall commence the running of the 20-day period for formal approval and certification as provided under N.J.S.A. 2A:30A-2(a);
- b. The "billing date", as the term is used in N.J.S.A. 2A:30A-2, shall be the earlier of the date upon which an invoice for payment is approved for payment or twenty (20) days after the invoice is received, unless within such 20-day period

the invoice is found to be incomplete or otherwise unacceptable and returned to the contractor, with a written explanation of deficiencies;

c. In the event that an invoice is found to be deficient and returned to the contractor, the “billing date” shall be calculated from the date that a corrected invoice is received.

d. Payment shall be considered to have been made on the date on which a check for such payment is dated;

e. Payment terms (e.g., “net 20”) offered by the contractor shall not govern the State’s obligation to make payment;

f. The following periods of time will not be included in the calculation of the due date of any contractor invoice:

(1) Any time elapsed between receipt of an improper invoice and its return to the contractor, not to exceed twenty (20) calendar days; or

(2) Any time elapsed between the State’s return of an improper invoice to the contractor and the State’s receipt of a corrected invoice.

9.1.6 The provisions of this Article 9 shall not govern the State’s payment obligations nor shall they supersede or modify any other contractual provision allowing the withholding of monies from the contractor to the extent that the contractor has not performed in accordance with the provisions of the contract. Nor shall this Article 9 govern the State’s payment obligations nor supersede or modify any other contractual provision governing contractor claims for additional compensation beyond the base contract price and approved change orders.

9.2 INTEREST

9.2.1 Interest shall be payable on amounts due the contractor if not paid within thirty (30) calendar days after the billing date specified in the above subparagraph 9.1.5(b), as provided under the State’s Prompt Payment of Contractors and Subcontractors Act (N.J.S.A. 2A:30A-01, et seq.) Interest on amounts due shall be payable to the contractor for the period beginning on the day after the required payment date and ending on the date on which the check for payment is drawn.

9.2.2 Interest may be paid by separate payment to the contractor, but shall be paid within thirty (30) calendar days of payment of the principal amount of the approved invoice.

9.2.3 Nothing in this Article 9 shall be construed as entitling the Contractor to payment of interest on any sum withheld by the State for any reason permitted under the contract or applicable law, or on any claim for additional compensation, over and above sums due under the base contract or approved change orders.

9.3 SCHEDULE OF VALUES AND FINAL PAYMENT

9.3.1 Unless otherwise directed, the Contractor shall furnish a schedule of amounts for Contract payments (Unit Schedule Breakdown,) of the total Contract price, showing the amount included therein for each principal category of the Work and for each Contractor

and Subcontractor, in such detail as requested, to provide a basis for determining progress payments. The schedule, as approved, shall be used only as a basis for the Contractor's estimates for progress payments, and approval by the DPMC does not constitute acceptance of the allocability and allowability of costs to a specific element of Work. The Contractor is cautioned that no payment requests shall be approved until the Unit Schedule Breakdown has been approved in writing by the DPMC.

9.3.2 The State will make progress payments monthly as the Work proceeds based upon the Unit Schedule Breakdown.

9.3.2 All material and Work paid pursuant to progress payments shall thereupon become the sole property of the State. This provision shall not be construed as relieving the Contractor from the sole responsibility for the protection of all material and Work upon which payments have been made for the restoration of any damaged work, or as waiving the right of the State to require the fulfillment of all of the terms and conditions of the Contract.

9.3.3 Following completion and acceptance of all work, the amount due the Contractor under this Contract shall be paid only upon satisfactory completion, by the Contractor, of all Contract close-out requirements, completion of a State audit on all Contract values and payments, and after the Contractor has furnished the State with a release of claims against the State, arising by virtue of this Contract, other than claims in stated amounts as may be specifically excepted by the Contractor from the release.

9.3.4 If for any reason the Contractor refuses final payment, the Project may be closed out by the State by the processing of a Final Contract Acceptance certification. The lack of such certificate shall not toll the limitations period applicable to Contractor claims against the State.

9.3.5 In addition to other warranties required by provisions of the Contract and specifications, the Contractor warrants that title to all Work, materials and equipment covered by an application for payment will pass to the State free and clear of all liens, claims, security interests or encumbrances, either upon incorporation into the construction or upon receipt of payment to the Contractor, whichever occurs first. This provision shall not be construed as relieving the Contractor from sole responsibility for the care and protection of materials and work upon which payments have been made, or for the restoration of any damaged work, or as a waiver by the State of its rights to require fulfillment of all terms of the Contract.

9.3.6 By recommending approval of any invoice, the Architect/Engineer shall not be deemed to represent that it has made exhaustive or continuous on-Site inspections to check the quality or quantity of the Work, or that it has reviewed the construction means, methods, techniques, sequences or procedures, or that it has made any examination to ascertain how and for what purpose the Contractor has used the moneys previously paid. The payment of an invoice does not constitute an acceptance of the Work. The State reserves the right to further inspect the Work and to withhold retainage and any additional funds required to pay for any corrective action for non-conforming work.

9.3.7 If any corporation licensed to do business in New Jersey shall be or become delinquent in the payment of taxes, assessments or fees due the State, unless under an

active appeal process or any final judgment in the State's favor against the Contractor, the DPMC may, in accordance with N.J.S.A. 54:49-19 or other applicable law withhold moneys due the said corporation for the purpose of assuring the payment to the State of such taxes, assessments, fees or judgment.

9.4 CERTIFICATION OF PAYMENTS TO SUBCONTRACTOR

Pursuant to N.J.S.A. 52:32-40, 41 and N.J.S.A. 2A:44-148; the Contractor shall submit a Certification of Prime Contractors form and a Certification of Subcontractor form for each Subcontractor identified in the Unit Schedule Breakdown, as part of the submission for each invoiced progress payment.

9.5 STORED MATERIALS

9.5.1 Unless specifically allowed in the Contract Documents, all materials and equipment must be delivered and installed or stored on the Site prior to payment for such material or equipment.

9.5.2 The DPMC may at its discretion allow payment for equipment stored off Site provided that the following has occurred:

- a. The DPMC has approved the Contractor's written request;
- b. The equipment has been properly stored in an approved location;
- c. The Contractor has established the Owner's title to the specific equipment;
- d. The Contractor has provided sufficient proof of insurance for the materials, equipment and the storage facility;
- e. The Contractor has submitted a release of liens on said stored equipment;
- f. The Contractor has submitted a statement agreeing to assume all costs for storage of material and equipment off Site, including, if required by the DPMC, the cost of storing such material and equipment in a bonded warehouse; and
- g. The Contractor furnishes the "Prime Contractor's Summary of Stored Materials" and "Agreement and Bill of Sale Certification for Stored Materials," forms respectively.

9.6 ALLOWANCES

9.6.1 The Contractor shall include in its bid all allowances as may be set forth in the Contract Documents. The Contractor shall purchase the "allowed materials" as directed by the DPMC on the basis of the lowest acceptable quote from at least three competitive offers or as a negotiated cost subject to DPMC approval. If the actual cost of the "allowed materials" is more or less than the stipulated allowance, the Contract price may be adjusted accordingly. The adjustment in Contract price shall be made on the basis of the actual purchase cost without additional charges for overhead, profit, bond premium or any other incidental expenses. The cost of installation of the "allowed materials," unless

otherwise specified, is to be included as the responsibility of the Contractor in whose Contract the allowance is included, and the Contractor installing such "allowed materials" shall not be entitled to additional payment for such installation.

9.6.2 Unless otherwise provided in the Contract Documents:

- a. These allowances shall cover the Contractor's true costs, including credit for any trade discount, of the materials and equipment required by the allowance, delivered at the Site, including all applicable taxes;
- b. The Contractor's costs for unloading and handling, labor, installation costs, overhead, profit and other expenses reasonably required in connection with such allowance items shall be included in the Contract sum and not as part of the allowances.

9.7 RETAINAGE

9.7.1 In making progress payments for Contract work completed, the State will retain ten percent (10%) of the approved invoice amount until final acceptance and completion of all work covered by the Contract.

9.7.2 The Contractor may, after 50% (fifty percent) of the Contract work is in place, and if the Work is proceeding on schedule, apply for a reduction in the amount retained by the State for the duration of the Contract. Such application must be in writing and accompanied by documentation granting formal consent of surety to the reduction in retainage request. If the DPMC determines that the Contractor's performance has been satisfactory and that the reduction is warranted and appropriate, the State may, with the next progress payment, release any portion of the accumulated retainage in excess of five percent (5%) of the Work in place and retain an amount equal to five percent (5%) of the Work in place for the duration of the Contract. If progress of the Work is not maintained in accordance with the approved schedule, the DPMC may elect to re-institute retainage of ten percent (10%) of the Work in place for the duration of the Contract.

9.7.3 Withholding Payment for Non-Delivery of Data:

- a. If technical data such as "as-built" drawings, reports, spare parts lists, repair parts lists, or instruction books (including additional and maintenance manuals), or any part thereof, are not delivered within the time specified by this Contract or are deficient upon delivery, the DPMC has the discretion to withhold from each invoice a percentage (in addition to any other retainage required by the Contract) of the Contract price in accordance with the following table:

When total contract price is:	Percentage to be withheld is:
Less than \$250,000.	10%
\$250,000.01 through \$1,000,000	5.0%
Over \$1,000,000	2.0%

- b. The withholding of any sums pursuant to this article shall not be construed as, or constitute in any manner, a waiver by the State of the Contractor's obligation to furnish the data required under this Contract. In the event the

Contractor fails to furnish these items, the State shall have those rights and remedies provided by law and pursuant to this Contract, in addition to, and not in lieu of, the sums withheld in accordance with this article.

9.8 MISCELLANEOUS

9.8.1 Disputes regarding nonpayment of a Contractor's invoice under this Article 9 may be submitted to non-binding Alternative Dispute Resolution (ADR) upon mutual agreement of the State and the Contractor. In such event, the State and the Contractor shall share equally the fees and expenses of the selected mediator, arbitrator, umpire or other ADR neutral. Provided, however, that nothing herein shall be construed, in whole or in part, as a waiver, release or modification of the provisions of the New Jersey Contractual Act, N.J.S.A. 59:13-1, et seq., which governs claims against the DPMC.

9.8.2 A Contractor not paid sums due under an approved invoice within thirty (30) days of the billing date may suspend performance without penalty for breach of contract, but only after providing the State with seven (7) days written notice of non-payment, and only in the event that the State fails to furnish the Contractor, within that seven-day period, a written statement of the amount withheld and the reasons for the withholding. Nothing herein shall be construed to excuse the Contractor's nonperformance, or to limit the State's rights and remedies relating to such non-performance, with regard to any monies withheld from the Contractor upon the proper notice provided under this Article 9, or with regard to any Contractor claim disputed by the DPMC.

ARTICLE 10 - CHANGES IN THE WORK

10.1 CHANGES IN THE WORK

10.1.1 The DPMC may at any time, issue a written Change Order which shall direct a change in the Work within the general scope of the Contract, including, but not limited to, changes:

- a. In the plans and/or specifications;
- b. In the method or manner of performance of the Work;
- c. In the State-furnished facilities, equipment, materials, services, or site; or directing acceleration in the performance of the Work; and/or
- d. In the time for the completion of the Work.

10.1.2 Change Orders

10.1.2.1 The Contractor agrees to prepare and submit, within ten (10) calendar days of encountering any conditions it considers a change, or upon receiving official notice of a proposed change or written direction to proceed with a change, a current DPMC form entitled "Contractor Change Order Request," to the DPMC. The Contractor shall submit an original of the form. Failure to submit a timely form may be grounds for rejection of the request for Change Order, at the DPMC's discretion.

10.1.2.2 All requests for Contract time extensions must be submitted in accordance with the requirements set forth in Articles 6 and 7, accompanied by copies of the current approved progress schedule and copies of a proposed progress schedule detailing the incorporation of the changed work and the effects of such incorporation on progress. Failure to provide all required information shall be grounds for rejection of the request.

10.1.2.3 DPMC will only consider a contract duration extension Change Order request arising from changes in the Work, if that change is proven by the Contractor to have caused a delay in the completion of the Project. When the Contract duration is increased as a result of a change, the resulting change in Contract amount will include the costs of extended performance, computed in accordance with the terms of this Section, and no further consideration of such costs arising from the specific modification will be given.

10.1.2.4 Every Change Order request submitted by the Contractor shall furnish a price breakdown, which shall cover all work involved in the change whether such work was deleted, added or changed and shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, overhead costs and profit. Any amount proposed for subcontracts shall be supported by an equally detailed breakdown. In addition, if the request includes a time extension, a justification (see section 10.1.4.) shall also be furnished. The request, together with the price breakdown and time extension justification, shall be furnished by the date specified by the DPMC.

10.1.2.5 The following rates shall apply in computing overhead (indirect costs) and profit for Change Orders that do not exceed \$25,000. The percentages shall be applicable for deleted work as well as additional work. When a change consists of both added and

deleted work, the applicable percentages shall be applied to the net cost or credit. In any event, the percentages shall not exceed the following:

- a. Overhead will be the sum of:
 - (1) fifteen percent (15%) of direct labor costs. NOTE: For the purpose of this article, the term "direct labor" shall include all foremen (identified by name and not included in the Project as the full-time superintendent or full time foreman as required elsewhere in the contract documents), equipment operators and skilled, semi-skilled and common laborers directly assigned to the specified operation. The term "direct labor costs" shall consist of the Contract or actual payroll rate of wage per hour and fringe benefits paid for each and every hour that such employees are actually engaged in the performance of the Work.
 - (2) fifteen percent (15%) of direct material costs. NOTE: For the purpose of this article, the term "direct material costs" shall consist of the actual costs of the materials including applicable tax and transportation charges.
- b. For rented equipment, an hourly rental rate will be used which will be determined based upon the monthly rental rates in the current edition of the Rental Rate Blue Book for Construction Equipment (Rental Book) and dividing it by 176. An allowance will be made for operating costs for each and every hour the equipment is actually operating in accordance with the rates listed in the Rental Book. The Contractor will be allowed only 65% (sixty-five percent) of the rental rate on Contractor-owned equipment.
- c. Bond premiums and payroll taxes, if applicable, will be allowed at actual cost. The Contractor shall submit from the surety to DPMC a letter for the bond premiums.
- d. The Contractor's profit on Subcontractor's work will be six percent (6%) of the Subcontractor's costs. Subcontractor indirect costs will be computed in the same manner as for the Contractor. The Contractor agrees to incorporate this article in each of its subcontracts. NOTE: When more than one tier of Subcontractor exists, for the purpose of markups, they shall be treated as one Subcontractor.
- e. A profit of six percent (6%), where profit is allowable by the terms of the applicable Contract provision, shall be added to the Contractor's total cost. Indirect costs shall not be duplicated in direct costs.

10.1.2.6 For Change Orders in excess of \$25,000 the maximum allowable percentages of 15% overhead and 6% profit applies unless negotiated lower based upon the nature, extent and complexity of the Work involved.

10.1.2.7 The DPMC, in order to avoid delays in the progress of work or when in the best interests of the State, has the discretion to direct the Contractor, in writing, to proceed with work claimed by the Contractor to be extra work, and/or to accelerate its work without a prior agreement on entitlement or costs. Such direction shall be in the form of a Letter of Direction. The Contractor may submit a claim for evaluation by

DPMC, for costs or for time on account of such work and/or acceleration on the form entitled "Contractor Change Order Request," completed in sufficient detail and in accordance with this article within ten (10) calendar days after receipt of the Letter of Direction. Nothing in this article shall excuse the Contractor from proceeding with the Work identified in the Letter of Direction and all other Contract Work. Issuance of a Letter of Direction under this article shall not be intended nor construed as an admission or acknowledgment by the State that the Contractor is entitled to additional compensation and/or time on account of such Work and/or acceleration.

10.2 ACCELERATION

The DPMC may order and direct the Contractor to accelerate its Work at any location(s) by increasing its forces, working overtime and/or working on Saturdays, Sundays, and holidays. If acceleration is required by the DPMC, and not due to any delays on the part of the Contractor, the Contractor will be reimbursed for additional costs.

ARTICLE 11 - CLAIMS AND DISPUTES

11.1 CONTRACTOR CLAIMS

11.1.1 Any claims made by a Contractor against the DPMC for damages, extra costs or any other claim made pursuant to the contract are governed by and subject to the New Jersey Contractual Liability Act, N.J.S.A. 59:13-1 et seq., as well as all the provisions in this Contract.

11.1.2 Upon presentation by the Contractor of a request in writing, the DPMC may review any decision or determination of the State or the Architect/Engineer as to any claim, dispute or any other matter in question relating to the execution or progress of the Work or the interpretation of the Contract Documents. Consistent with the intent of this Contract, the DPMC may schedule a conference for the purpose of settling or resolving such claims, disputes or other matters. Where such a conference is conducted, the Contractor and/or the Architect/Engineer shall be afforded the opportunity to be heard on the matter in question. Following review of the Contractor's request, the DPMC and the Contractor may settle or resolve the disputed matter, provided however that any such negotiations, conferences, settlement or resolution shall be subject to all requirements imposed by law, including where applicable, the New Jersey Contractual Liability Act (N.J.S.A. 59:13-1 et seq.). The DPMC's participation in any effort to negotiate, settle or resolve any such claim or dispute with the Contractor shall not operate to toll or extend the time limitations for notice or suit under the New Jersey Contractual Liability Act.

11.2 MUTUAL RIGHTS AND RESPONSIBILITIES OF ALL CONTRACTORS AND THE ARCHITECT/ENGINEER

11.2.1 Any Contractor or the Architect/Engineer which by its own acts, errors or omissions, damages or unnecessarily delays the Work or otherwise causes damage to the State, any other Contractor or the Architect/Engineer, shall be directly responsible to the aggrieved party or parties, for all costs and expenses incurred due to any such delays and/or damages whether by settlement, compromise or arbitration or judgment.

11.2.2 Any Contractor damaged by the actions of another Contractor or Architect/Engineer shall have a direct right to recovery against the party causing such damages, but shall not have a right to recover such damages against the State.

11.2.3 In addition, the party responsible for causing such damages agrees to defend, indemnify and save harmless the State from all such claims and damages. Nothing contained in this paragraph shall be construed to relieve the responsible party from any liability or damage sustained on account of such acts, errors or omissions.

11.2.4 The State shall not be held vicariously liable to any Contractor for any damages or extra costs caused by any acts or omissions by another party including but not limited to actions of the Architect/Engineer as specified in the above paragraph. The Contractor's exclusive remedy shall be against the party directly responsible for causing such damages or extra costs.

ARTICLE 12 - TERMINATION/SUSPENSION

12.1 SUSPENSION OF THE WORK / STOP WORK

12.1.1 If the Contractor fails to correct defective work or persistently fails to carry out the Work in accordance with the Contract Documents, or if the DPMC determines that it is in the best interest of the Project to do so, the DPMC may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated and the DPMC provides written notice to the Contractor that the stopped Work may resume.

12.1.2 The DPMC shall have the right to defer the beginning or to suspend the whole or any part of the Work herein contracted to be done whenever, in the opinion of the DPMC, it may be necessary or expedient for the State to do so.

12.2 TERMINATION FOR CAUSE

12.2.1 If the Contractor persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials so as to avoid or eliminate delays in the orderly progress of the Work in accordance with the approved schedule; or if the Contractor fails to make prompt payment to any Subcontractor or for materials or labor; or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction; or if the Contractor is guilty of a material breach of a provision of the Contract Documents or otherwise fails to carry out the Work in accordance with the Contract Documents, then the DPMC may, without prejudice to any other right or remedy, and after giving the Contractor and its surety three (3) working days written Notice to forthwith address such breach and default with diligence and promptness, terminate the employment of the Contractor by the issuance of a written Notice to that effect to the Contractor and its surety, should the Contractor fail to comply with the demands of the original above mentioned Three Day Notice.

12.2.2 Upon such termination, the DPMC may take possession of the Site and of all the materials, equipment, and tools on the Site and of any materials stored off Site paid for by DPMC, and may finish the Work by whatever method the DPMC may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

12.2.3 In the event of termination for default, the surety shall either complete the principal's work or finance the completion of the Work. The surety shall not have the right to do nothing. In the event of the surety's breach of its obligations to the State, the surety shall be subject to all available damages under the law, including but not limited to debarment and the penalties imposed by New Jersey's Consumer Fraud Act.

12.2.4 Within seven (7) calendar days following receipt of Notice of Termination by the surety, the surety shall submit in writing its intention to satisfy its bond obligation to the State as obligee, and to explain its plan to complete the Work, tender a completing Contractor or finance the completion of the Work.

12.2.5 If the surety elects to take over the Work and complete same or to tender a completing Contractor, it must furnish notice of its intent to do so in writing over the

signature of an authorized representative and such notice shall be served upon the DPMC within seven (7) calendar days after service upon the surety of the Notice of Termination. This document shall identify the Contractor to perform this work.

12.2.6 If the surety elects to satisfy its bond obligation by financing the completion of the Work, in lieu of taking over same, the surety and State shall enter into an agreement, within thirty (30) days of the termination Notice, setting forth the details of the payments to be made by the surety. All current obligations for labor and materials incurred and outstanding by the defaulting Contractor on this Project shall be paid by the surety without delay, subject to allowance of reasonable time to verify such claims by the surety.

12.2.7 If the surety fails to satisfy its bond obligations within the time frames established above, the DPMC may undertake the completion of the Project in any manner deemed appropriate. In that circumstance, the surety shall not be relieved of any of its payment and performance bond obligations.

12.2.8 If the unpaid balance of the Contract sum exceeds the cost of finishing the Work (including but not limited to liquidated damages for delays and all other remaining damages sustained by the State originating from such breach of Contract), such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor and its surety shall be obligated to pay the difference to the DPMC promptly upon receipt of billing from the State, and this obligation shall survive the termination of the Contract.

12.3 OWNER'S RIGHT TO COMPLETE THE WORK

12.3.1 Alternatively, should the Contractor fail or refuse to correct its breach and default after receiving the required notice as provided under Section 12.2 hereof, the DPMC, in lieu of terminating the Contractor's employment, may provide for the correction and completion of all remaining Work by other means, and deduct all costs associated with such correction and completion from any undisbursed balance of funds (including earned retainage) remaining under the Contract. Such deduction may be documented by issuance of one or more deductive change orders. DPMC's correction or completion of Work under this paragraph shall not operate to waive, release or diminish the liability of the Contractor and its surety to the State for any breach or default by the Contractor.

12.4 TERMINATION FOR CONVENIENCE

12.4.1 The DPMC may, at any time, terminate the Contract in whole or in any part for the DPMC's convenience and without cause when the DPMC in its sole discretion views termination to be in the public interest.

12.4.2 Upon receipt of an order of Termination for Convenience, the Contractor shall not proceed with any item of work which is not specified in the Order of Termination. The Contractor shall complete all items of work specified in the termination order. Such work shall include punch list items and all work necessary to ensure the safety of the public, to properly secure existing work already constructed or partially constructed and to secure the Project Site. This work so ordered shall be performed in accordance with the Contract Documents, and may include items of work not in the original Contract. The Work performed shall be considered substantially complete upon completion and

acceptance of all items of work specified in the Order, except punch list items. After completion of the punch list items and all documents required by the Contract, the Contract shall terminate upon issuance of a Final Certificate and payment. The DPMC reserves the right to declare in default a Contractor who fails to carry out the conditions set forth in an Order of Termination for Convenience.

12.4.3 When the DPMC orders termination of the Contract for Convenience, all completed items of work as of that date will be paid for at the Contract prices.

12.4.3.1 Payment for partially completed work will be paid for at agreed prices.

12.4.3.2 Payment for new items, if any, will be made either at agreed prices or in accordance with Article 10.

12.4.3.3 Materials obtained by the Contractor for the Work but which have not been incorporated therein may, at the option of the State, be purchased from the Contractor at actual cost delivered to a prescribed location, or otherwise disposed of as mutually agreed.

12.4.4 Within sixty (60) days of the effective termination date, the Contractor shall submit claims for additional costs actually incurred, not covered above or elsewhere in the Contract. Such claims may include reasonable mobilization costs, overhead expenses attributable to the Work performed, Subcontractor costs not otherwise paid for, actual idle labor costs if Work is stopped in advance of the termination date. The DPMC will not compensate the Contractor for costs prohibited under provisions of the Contract and/or anticipated profits on work not performed.

12.4.5 If the DPMC terminates the Contractor for cause as provided under Article 12.2 of the General Conditions, and if a court of law subsequently determines such termination for cause to have been undertaken without lawful justification, then such termination shall be deemed a termination for convenience governed by this Article 12.4. In that event, recovery by the Contractor and/or the Contractor's surety shall be limited to those costs which are recoverable following a termination for convenience under this Article 12.4.

ARTICLE 13 – OTHER REQUIREMENTS

13.1 PREVAILING WAGE

13.1.1 The Contractor shall comply with the New Jersey Prevailing Wage Act Laws of 1963, Chapter 150, (N.J.S.A. 34:11-56.25 et seq.) and all amendments thereto, and this act is hereby made a part of every Contract entered into on behalf of the State of New Jersey through the DPMC, except those Contracts which are not within the contemplation of the Act. Provisions of the Act include the following stipulations and requirements:

a. All workers employed in the performance of every Contract in which the Contract sum is in excess of \$2,000 and to which the DPMC is a party shall be paid not less than the prevailing wage rate as designated by the Commissioner, Division of Labor or his or her duly authorized representative.

(1) The Contractor performing public work for the DPMC and which is subject to the provisions of the Prevailing Wage Act, shall post the prevailing wage rates for each craft and classification involved as determined by the Commissioner, Division of Labor. This posting shall include the effective date of any changes thereof, and shall be displayed in prominent and easily accessible places at the Site of the Work or at such place or places as are used by the Contractor/Subcontractor to pay workers' wages.

(2) At the time of the bid due date, the Bidder and any Subcontractors identified by the Bidder must be registered in accordance with “The Public Works Contractor Registration Act” (N.J.S.A. 34:11-56.48 et seq.) All questions regarding registration shall be addressed to:

Contractor Registration Unit
New Jersey Department of Labor
Division of Wage & Hour Compliance
P O Box 389
Trenton NJ 08625-0389
Telephone: 609-292-9464
FAX: 609-633-8591

b. In the event it is found that any worker, employed by any Contractor covered by any Contract in excess of \$2,000 for any public work to which the DPMC is a party, has been paid a rate of wages less than the prevailing wage required by such Contract, DPMC may terminate the Contractor's right to proceed with the Work, or such part of the Work as to which there has been failure to pay required wages, and may otherwise execute the Work to completion.

c. In the event that any Subcontractor retained by a Contractor on any Contract in excess of \$2,000 for any public work to which the DPMC is a party, has been paid a rate of wages less than the prevailing wage required by such Contract, DPMC may terminate the Contractor's right to proceed with the Work, or such part of the Work as to which there has been failure to pay required wages, and may

otherwise execute the Work to completion or may require that the Contractor immediately substitute a new Subcontractor at the costs set forth in the Contract.

d. Nothing contained in the Prevailing Wage Act shall prohibit the payment of more than the prevailing wage rate to any worker employed on a Project.

e. The Contractor shall, as a condition of subcontract with any tier Subcontractor, require compliance with this section as a condition of Subcontract.

f. The State may audit the Contractor's conformance with the Prevailing Wage Act. If the result of such audit determines that the Contractor has not complied with the Prevailing Wage Act then such Contractor shall be responsible for the cost of this audit.

13.2 PATENTS

13.2.1 The Contractor shall hold and save the State and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for or on account of any patented or non-patented design, device, invention, process, article or appliance manufactured or used in the performance of the Contract, including its use by the State, unless otherwise specifically stipulated in the Contract Documents.

13.2.2 License and/or royalty fees for the use design, device, invention, process, article or appliance which is authorized by the State must be reasonable, and paid to the holder of the patent or his or her authorized licensee directly by the State and not by or through the Contractor.

13.2.3 If the Contractor uses any design, device, invention, process, article or appliance covered by letters, patent or copyright, it shall provide for such use by suitable agreement with the State of such patented or copyrighted design, device or material. It is mutually agreed and understood that, without exception, the Contract prices shall include all royalties or costs arising from the use of such design, device, invention, process, article or appliance in any way involved in the Work.

13.2.4 The Contractor and/or its surety shall indemnify and save harmless the State from any and all claims for infringement by reason of the use of such patented or copyrighted device, invention, process, article or appliance, or any trademark or copyright in connection with Work performed under this Contract, and shall defend and indemnify the State for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the execution of the Work or after the completion of the Work. This section shall survive the termination of the Contract.

13.3 RIGHT TO AUDIT

13.3.1 The State reserves the right to audit the records of the Contractor in connection with all matters related to its Contract. The Contractor agrees to maintain its records in accordance with "Generally Accepted Accounting Principles," for a period of not less than five (5) years after receipt of final payment. All charges must be supported by appropriate documentation, including, but not limited to canceled checks. All records

shall be made available to the New Jersey Office of the State Comptroller or other State audit agency upon request and at no cost to the State.

13.3.2 The Contractor shall maintain all documentation related to products, transactions or services under this contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller or other State audit agency upon request and at no cost to the State.

13.3.2 The Contractor shall develop, maintain and make available to the DPMC on request such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, Change Orders, all original estimates, takeoffs and other bidding documents, all Subcontractor and supplier Contracts and changes, all records showing all costs and liabilities incurred or to be incurred in connection with the Project (including all Subcontractor and supplier costs), all payment records and all records showing all costs incurred in labor and personnel of any kind, records and other data as the State may request concerning work performed or to be performed under this Contract.

13.3.3 The Contractor acknowledges and agrees that no claim for payment which is premised to any degree upon actual costs of the Contractor shall be recognized or payable by the State except and to the extent that such actual costs are substantiated by records required to be maintained under these provisions.

13.3.4 The Contractor acknowledges and agrees that its obligation to establish, maintain and make available records and the State's right to audit as delineated herein shall extend to actual costs incurred by Subcontractors in performing work required under the Contract Documents. The Contractor shall require in each subcontract that the Subcontractor establish, maintain and make available to the State all records as defined and delineated herein, relating to all work performed under the Subcontractor including work performed by a sub-Subcontractor.

13.4 INSURANCE

13.4.1 Insurance To Be Carried By The Contractor:

The Contractor shall obtain and maintain, at its expense and for the duration of the contract, minimum insurance coverage set forth below. By requiring such minimum insurance, the State of New Jersey shall not be deemed or construed to have assessed the risk that may be applicable to the Contractor under this contract. The Contractor shall assess its own risks and if it deems appropriate and/or prudent, maintain higher limits and/or broader coverage. The Contractor is not relieved of any liability or other obligations assumed or pursuant to the Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration or types.

a Commercial General Liability:

(1) Commercial General Liability (CGL)-ISO occurrence form CG001 or a substitute form providing a minimum coverage of \$2,000,000 per occurrence for bodily injury liability and \$2,000,000 per occurrence for property damage liability and shall cover liability arising from:

- Premises/Operations

- Independent Contractors
 - Products/Completed Operations
 - Personal and Advertising Injury
 - Liability assumed under an insured contract (including defense cost assumed)
- (2) The State of New Jersey shall be included as an additional insured under the CGL using ISO additional insured endorsement CG 20 10 and CG 20 37 or a substitute providing equivalent coverage, which endorsement shall include coverage for the State of New Jersey arising out of the completed operations of the contractor, and which coverage shall be maintained in effect for the benefit of the State of New Jersey for a period of three (3) years following the completion of the work specified in section 7.3 of this contract. Additional Insured coverage as required in this subparagraph shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to the State of New Jersey.
- (3) The CGL general aggregate shall apply separately to this project using ISO CG 2503 form – designated construction projects(s) General Aggregate Limit.
- (4) There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from explosion, collapse or underground property damage.
- (5) If not included in the policy form the CGL policy must be endorsed with a separation of insureds (severability of interests) endorsement.
- (6) CGL policy must provide or be endorsed (ISO form CG 24 04) to provide for waiver of subrogation.

b Business Automobile Liability:

- (1) Contractor and subcontractors shall maintain business auto liability insurance and such insurance shall cover liability arising out of any auto (including owned, hired and non-owned autos).
- (2) The limits of liability shall be not less than \$1,000,000 per occurrence for both bodily injury and property damage liability.
- (3) Business Automobile coverage shall be written on ISO form CA 00 01 or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later additions of CA 00 01.
- (4) If required by law, the business auto policy shall be endorsed to provide pollution liability coverage equivalent to that provided under the ISO pollution liability broadened coverage for covered autos form

CA 99 48 and the Motor Carrier Act endorsement (MCS 90) shall be attached.

- (5) Waiver of Subrogation -- Contractor waives all rights against the State of New Jersey for recovery of damages to the extent these damages are covered by the business auto liability insurance obtained by Contractor pursuant to Paragraph 2.0 of this Agreement.
- c Workers Compensation: Workers Compensation Insurance applicable to the laws of the State of New Jersey and other State or Federal jurisdiction is required to protect the employees of the Contractor or any Subcontractor who will be engaged in the performance of this Contract. This insurance shall include employers' liability protection with a limit of liability not less than \$500,000.
- d Umbrella Liability: Contractor must maintain an Umbrella Liability Policy excess of the Commercial General Liability, Automobile Liability and Employer Liability coverage.
 - (1) The coverages of the umbrella policy must be as broad as the primary policies covered by this policy and include a "drop-down" provision if the primary coverage becomes impaired or exhausted.

13.4.2 Insurance To Be Carried By The State of New Jersey:

- a Builders Risk Insurance: Unless otherwise provided in this agreement the State of New Jersey shall provide and maintain, in a company or companies lawfully authorized to do business in the jurisdiction which this project is located, Builders Risk Insurance in the amount of the initial contract amount as well as subsequent modifications for the entire project at the site on a replacement cost basis.
 - (1) The Builders Risk coverage shall be on an "All Risk of direct physical loss or damage" or equivalent policy form and include theft, earthquake, flood, temporary structures, demolition and increased cost of construction, architects fees and expenses.

Also the insurance must include coverage for Equipment Breakdown Coverage (a.k.a. Boiler & Machinery) which shall cover insured Equipment during installation and testing. The Builders Risk insurance shall include the interest of the State of New Jersey, the general Contractor, subcontractors and sub-tier contractors in the project.
 - (2) The Builders Risk Policy shall cover all materials equipment and supplies, assemblies and furnishings intended for specific installation in the project while located at the site. The policy will cover portions of the work off site and portions of the work in transit subject to the policy sub-limits for these coverages.
 - (3) Waivers of Subrogation -- The State of New Jersey and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees and (2) the

Architect/Engineer, Architect/Engineer's Consultants, and any of their subcontractors, Sub-subcontractors, agents and employees for damages caused by fire or other causes of loss to the extent covered by the Builders Risk insurance or any other property insurance applicable to the work.

- (4) The Builders Risk policy will provide for a waiver of subrogation against all interested parties covered by the policy but only to the extent the loss is covered by the policy.
- (5) The above insurance shall apply only to the work described in this contract, and shall not apply to alterations, repairs, maintenance and installations of systems, equipment and other items of work which do not result in creating additional habitable space. This insurance shall not protect against damage or loss to any of the Contractor's or Subcontractor's tools, equipment, scaffolding, staging towers or forms and Contractor's materials stored on Site which are not part of the construction Project,. It is understood that the Contractor will, at its own expense, carry all insurance which may be required to provide the necessary protection against such loss or damage herein described which shall contain a waiver of any right of subrogation against the State of New Jersey.
- (6) Deductible Provisions -- The insurance protection described herein may contain a deductible clause. The State of New Jersey agrees to bear the cost of all deductibles of the Builders Risk Policy.
- (7) Loss Reporting and Loss Adjustment – The Contractor will receive a Loss Reporting Form whenever Builders' Risk Insurance is written. This form includes appropriate loss reporting instructions. In the event of loss, the Contractor shall immediately notify the State of New Jersey, DPMC, in writing, and take any other appropriate steps as may be required under the standard builders' risk insurance policy in effect. Upon the occurrence of any loss or damage prior to the acceptance of the building by the State, the Contractor shall, at the State's option, replace and repair the damaged work as originally provided in the drawings and specifications at no additional compensation to that provided in the original Contract.
- (8) Status Trustee for Loss Adjustment -- All losses will be adjusted with, and payable to, the State of New Jersey, as trustee for the insured as their interests may appear. The Contractor shall be named jointly with the State in all policies of insurance, all of which shall be open to inspection by the State.
- (9) This provision shall not relieve the Contractor from its obligation to complete, according to plans and specifications, the Project covered by the Contract, and the Contractor and its surety shall be obligated to full performance of the Contractor's undertaking.

13.5 ASSIGNMENT OF ANTITRUST CLAIMS

13.5.1 The Contractor recognizes that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by the ultimate purchaser. Therefore, and as consideration for executing this Contract, the Contractor, acting herein by and through its duly authorized agent, hereby conveys, sells, assigns, and transfers to the State of New Jersey, for itself and on behalf of its political subdivisions, instrumentalities, and public agencies, all right, title and interest to all claims and causes of action it may now or hereafter acquire under the antitrust laws of the United States or the State of New Jersey, relating to the particular goods or services purchased or acquired by the State of New Jersey or any of its political subdivisions or public agencies pursuant to this Contract.

13.5.2 In connection with this assignment, the following are the express obligations of the Contractor:

- a. The Contractor will take no action which will in any way diminish the value of the rights conveyed or assigned hereunder.
- b. The Contractor will advise the Attorney General of New Jersey and DPMC:
 - (1) in advance of its intention to commence any action on its own behalf regarding any such claim or cause(s) of action; and/or
 - (2) immediately upon becoming aware of the fact that an action has been commenced on its behalf by some other person(s) of the tendency of such action.
- c. The Contractor will notify the defendants in any antitrust suit of the fact of the within assignment at the earliest practicable opportunity after the Contractor has initiated an action on its own behalf or becomes aware that such an action has been filed on its behalf by another person. A copy of such Notice will be sent to the Attorney General of New Jersey and the DPMC.

13.5.3 It is understood and agreed that in the event any payment under any such claim or cause of action is made to the Contractor, it shall promptly pay over to the State of New Jersey the allotted share thereof, if any, assigned to the State hereunder.

END, GENERAL CONDITIONS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections apply to this Section.
- B. Hazardous Materials Documents:
 - 1. Division 02 Section "Asbestos Roofing Systems Abatement".
 - 2. Division 02 Section: "Removal and Disposal of Asbestos Containing Materials".
 - 3. Division 02 Section: "Hazardous Materials".
 - 4. Division 02 Section: "Treatment of Lead in Construction".
 - 5. Division 02 Section "Hazardous Materials Assessment Report".
- C. Microbial Growth (Mold):
 - 1. In addition to other hazardous materials listed in the Report that is part of the specifications, The Contractors are advised that the presence of microbial growth (mold) exists within the building. The Contractors shall comply with the Public Employees Occupational Safety and Health Program "Mold in the Workplace Prevention and Control" Bulletin when impacts to microbial surfaces are anticipated

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: The project consists of Restoration Upgrades to the Exterior Building Envelope, and associated work at the subject property.
 - 1. Project Location: 135 West Hanover Street, Trenton, Mercer County, NJ.
 - 2. Owner: State of New Jersey.
- B. Architect Identification: The drawings and specifications were prepared for the Project by Lammey + Giorgio Architects, 215 Highland Avenue, Haddon Township, NJ 08108.
 - 1. Structural Engineer: O'Donnell & Naccarato
 - 2. Environmental Engineers: USA Environmental Management, Inc.
- C. Project Manager: New Jersey Division of Property Management & Construction has been appointed by Owner to serve as Project Manager.
- D. Project Summary: The work includes, but is not limited to the following:
 - 1. Roof Replacement and associated work.

2. Exterior masonry and concrete repairs, including but not limited to brick replacement, repairs, repointing, cleaning, water repellent coatings, joint sealants, and other work indicated or implied by the construction documents.
 3. Replacement of existing exterior doors and windows.
 4. Removal of hazardous materials associated with the exterior building upgrades.
 5. Preparation and painting of steel fire escapes.
 6. Repairs to existing exterior entrance landings, stairs, railings, retaining walls and caps.
 7. The main roof area measures approximately 9,840 Square Feet (SF), which includes the penthouse roof area.
 8. Refer to Hazardous Materials Report that is included in the specifications.
- E. Project Duration: Refer to Bidding documents for number of consecutive calendar days from the date of Notice to Proceed (NTP) issued by the State of New Jersey. Work hours are 7:00AM to 3:30PM, Monday through Friday.
- 1.3 CONTRACT
- A. Project will be constructed under a Lump Sum construction contract. Bidders must be classified with the Division of Property Management & Construction (DPMC).
- 1.4 WORK SEQUENCE (Not Used)
- 1.5 USE OF PREMISES
- A. General: Contractor's use of premises is limited to the work area and by the Owner's right to perform work or to retain other contractors on portions of Project.
1. Contractor shall have limited access to the Building, in order to conduct the work. The building may be partially occupied during the work. The Contractor shall cooperate with Owner in the completion of the work. A site area outside the building will be available for lay-down purposes.
- 1.6 SPECIFICATION FORMATS AND CONVENTIONS
- A. Specification Format: The Specifications are organized into Divisions and Sections using the 33-division format and CSI/CSC's "MasterFormat 2004" numbering system.
1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense

requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 011000

SECTION 011400 - BUILDING SECURITY, PROTECTION AND CONTRACTOR USE OF THE PREMISES

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Site and building access, parking, deliveries and storage of materials and machinery must be coordinated with the State of New Jersey.
- B. Utilities are available for the Contractor's use on a limited basis; coordinate with the State of New Jersey.
- C. Coordinate the following with the State of New Jersey.
 - 1. Work areas, working conditions, materials and equipment storage, temporary office, portable toilets, fence and gates.
 - 2. Noise and odor restrictions, material approvals and working hours.
 - 3. Security issues.
 - 4. Protection of interior and exterior building finishes.
- D. The content of this section shall not relieve the contractor from complying with the terms of the DPMC "Instructions To Bidders and General Conditions" included in the project specifications.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 COORDINATION, SITE ACCESS, PARKING, DELIVERIES, AND STORAGE

- A. The contractor shall provide a daily Progress Report to the DPMC Project Manager that identifies the construction work to be performed and its location.
- B. It should be noted that other projects may be in progress concurrently with this project within the building. The contractor shall coordinate their activities accordingly.
- C. Site access, deliveries, traffic control, parking, material storage and trailer locations must be coordinated with the State of New Jersey and DPMC Project Manager.
 - 1. All Contractor equipment, storage, dumpsters, etc. must be kept on asphalt. If the Contractor requests, and the State approves these items to be located on lawns, or if the Contractor requires access across lawns, they shall be responsible to retain a utility protection subcontractor to insure protection. Any utility and/or surface damage will be the responsibility of the Contractor to repair or replace.

2. Temporary 8-foot high chain link fencing must be provided at dumpsters, material and equipment storage, portable toilet, contractor trailer(s) areas, etc. Waste removal canopies must also be fenced. All chain link fence gates must be equipped with padlocks. Provide three (3) sets of keys for each padlock to the State.
 3. All waste removal dumpsters and/or trucks must be provided with tarps at the end of each business day.
- D. The Contractor must coordinate in advance with the State regarding protection of facilities, equipment and people.
 - E. The use of a crane for lifting materials will only be allowed after prior approval, with 48 hours minimum notice, from the DPMC Project Manager. Whenever a crane is scheduled on site, the Contractor shall coordinate and pay for all, costs associated, including but not limited to road closure, permits, notifications, Police assistance, and other safety provisions required by the State of New Jersey and the City of Trenton.

3.2 ADDITIONAL REGULATIONS

- A. Smoking is not permitted in the building or on the grounds of the facility.
- B. All Contractor employees will be required to sign-in each day.
- C. The Contractor shall not unreasonably encumber the facilities with its equipment or work to be performed. The Contractor shall, at all times during the progress of the work, keep the site free from the accumulation of all rubbish and debris caused by its performance. The Contractor shall remove all debris and rubbish from or related to its work to the satisfaction of the State of New Jersey.
- D. The Contractor must control construction related to dust on the site. The Contractor must submit a detailed dust control plan for approval by the DPMC Project Manager prior to commencement of work.
- E. The Contractor shall adequately secure and protect their equipment, materials and vehicles. The State assumes no liability for any damage to or theft of the contractor's property.
- F. The Contractor is fully responsible to assure the enforcement of all safety precautions including compliance with OSHA or any other applicable standards for all of their employees and property while performing all services.
- G. Under absolutely NO circumstances will the Contractor's personnel, materials or equipment gain access or use routes in the building other than to undertake work associated with door and window replacements.
- H. The Contractor shall, at all times, enforce strict discipline and good order among their employees and shall not employ any unfit persons or any non-skilled person in the task assigned to him/her. The Contractor shall supervise and direct their work using their best skill and attention.
- I. The Contractor shall employ a competent, full-time supervisor to appropriately supervise the work and protect people and the facilities. The supervisor shall represent the firm and have the ability to fully communicate with State personnel and his/her employees and have the

authority to make immediate decisions for on-site problem resolution when required.

- J. The Contractor agrees that upon request by the DPMC Project Manager, they shall immediately remove from the site service hereunder any of its employees who are: incompetent; prone to tardiness, absenteeism or theft; are improper in conduct; or are not qualified or needed to perform the work assigned.
- K. The Project Architect in cooperation with the contractor, DPMC, and Building Management representatives, shall develop a "Project Directory" which identifies key designated representatives who may make decisions. Phone and cell phone numbers and pagers must be identified for immediate problem resolution.

3.3 WORKING HOURS, NOISE AND ODOR RESTRICTIONS, MATERIAL APPROVALS

- A. For the purposes of this project, regular working hours shall be from 7:00am to 3:30pm on weekdays.

*Note that if the Contractor intends to use a crane or other such vehicles to handle materials, then said machinery may be on site and operate only when schedule and approved as noted above and may only access the building from approved locations. The paths to be taken by said machinery shall likewise be subject to prior approval.

- B. All material safety data sheets shall be submitted and approved by the DPMC Project Manager prior to use of the material.

3.4 SECURITY ISSUES

- A. The Contractor and his/her employees may be subject to a security clearance by the State Police. prior to their commencement of work on the site. Specific personal information required for such clearance might include full name, address, social security number and date of birth. The State Police may issue security badges to all approved personnel. If issued, the Contractor and all his/her employees must wear these badges at all times while at the site. The State will advise during the Bidding period.

3.5 PROTECTION OF INTERIOR AND EXTERIOR

- A. The Contractor shall protect all exterior and interior areas from damage caused during the work.
- B. The Contractor shall take care to avoid damage to or soiling of any part of the building, driveways, parking lots, curbs, sidewalks, canopies, greenhouse, and building interiors, and is responsible for all damages or destruction caused directly or indirectly by its performance to any part of the buildings or adjoining property. Any damage or destruction caused by the Contractor or its employees shall be repaired as directed by the DPMC Project Manager to their satisfaction with all costs charged to the Contractor. The costs may be deducted from any and all amounts due to the contractor.
- C. The Contractor is responsible for the cost of cleanup of dust, dirt and stains caused by the work to the satisfaction of the DPMC Project Manager. The Contractor shall take all necessary precautions to keep dust, dirt and debris to a minimum within the construction area.

- D. In order to confirm existing conditions, prior to work commencing the Contractor shall photograph and video all conditions at the exterior and interior that could be affected by the work. This shall include the building exterior, canopies, all site improvements (paving, curbs, sidewalks, landscape, fences, etc. Interior photographs and video shall include all areas where the Contractor will require access to perform work. Submit four (4) copies to the DPMC Project Manager.
1. Note that all roof drains were tested prior to bid and all drains were found to flow properly. Prior to work commencing the Contractor shall test all roof drains in the presence of the Roof Monitor to confirm that they are functioning properly and accept the existing conditions. Report problems with drain flow to the DPMC Project Manager immediately for resolution. Any subsequent problems with clogged drains will be the Contractor's responsibility to correct.

END OF SECTION 011400

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections, apply to this Section.
- B. State of New Jersey Bid Proposal Form.
- C. Division 04 Section "Maintenance of Existing Masonry".
- D. Division 04 Section "Stone Repair".
- E. Division 08 Section "Wood Door Restoration".

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for unit prices.

1.3 DEFINITIONS

- A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, and profit.
- B. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- C. List of Unit Prices: A list of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

- A. Unit Price No. 1 - "Add" and "Deduct" Unit Prices for Repointing of Brick, Terracotta and Limestone: As directed by the Architect, remove existing mortar as specified and repoint in accordance with Section 040120 - Maintenance of Unit Masonry.
 - 1. Description: Repoint existing joints at Brick, Terracotta and Limestone components.
 - 2. Unit of Measurement: Square Foot (SF).
 - 3. Include in the Base Bid the quantities depicted on the drawings.

- B. Unit Price No. 2 - "Add" and "Deduct" Unit Prices for Removal and Replacement of Damaged Brick: As directed by the Architect, remove sections of damaged brick and replace with new brick in accordance with Section 040120 - Maintenance of Unit Masonry.
1. Description: Removal and disposal of sections of damaged brick and replace with new brick to match existing.
 2. Unit of Measurement: Square Foot (SF).
 3. Include in the Base Bid the quantities depicted on the drawings.
- C. Unit Price No. 3 - "Add" and "Deduct" Unit Prices for Limestone Spall Repairs: As directed by the Architect, repair limestone spalls in accordance with Section 040120 - Maintenance of Unit Masonry.
1. Description: Repairs to spalled limestone.
 2. Unit of Measurement: Square Foot (SF).
 3. Include in the Base Bid the quantities depicted on the drawings.
- D. Unit Price No. 4 - "Add" and "Deduct" Unit Prices for Limestone Crack Repairs: As directed by the Architect, make repairs at limestone cracks in accordance with Section 040120 - Maintenance of Unit Masonry.
1. Description: Repairs to cracked Limestone.
 2. Unit of Measurement: Linear Foot (LF).
 3. Include in the Base Bid the quantities depicted on the drawings.
- E. Unit Price No. 5 - "Add" and "Deduct" Unit Prices for Terracotta Spall Repairs: As directed by the Architect, repair terracotta spalls in accordance with Section 040120 - Maintenance of Unit Masonry.
1. Description: Repairs to spalled terracotta.
 2. Unit of Measurement: Square Foot (SF).
 3. Include in the Base Bid the quantities depicted on the drawings.
- F. Unit Price No. 6 - "Add" and "Deduct" Unit Prices for Terracotta Crack Repairs: As directed by the Architect, make repairs at terracotta cracks in accordance with Section 040120 - Maintenance of Unit Masonry.
1. Description: Repairs to cracked Terracotta.
 2. Unit of Measurement: Linear Foot (LF).
 3. Include in the Base Bid the quantities depicted on the drawings.

- G. Unit Price No. 7 - "Add" and "Deduct" Unit Prices for Terracotta Replacement: As directed by the Architect, replace sections of terracotta in accordance with Section 040120 - Maintenance of Unit Masonry.
1. Description: Removal and disposal of sections of damaged terracotta and replace with new terracotta to match existing.
 2. Unit of Measurement: Square Foot (SF).
 3. Include in the Base Bid the quantities depicted on the drawings.
- H. Unit Price No. 8 - "Add" and "Deduct" Unit Prices for Relief Angle Repair: As directed by the Architect, repair sections of relief angles in accordance with the Structural Drawings. _____.
1. Description: Relief angle repairs.
 2. Unit of Measurement: Linear Foot (LF).
 3. Include in the Base Bid the quantities depicted on the drawings.
- G. Unit Price No. 9 - "Add" and "Deduct" Unit Prices for Relief Angle Replacement: As directed by the Architect, replace sections of relief angles in accordance with the Structural Drawings. ____.
1. Description: Removal and disposal of sections of damaged relief angles.
 2. Unit of Measurement: Linear Foot (LF).
 3. Include in the Base Bid the quantities depicted on the drawings.
- H. Unit Price No.10 - "Add" and "Deduct" Unit Prices for Through-Wall Flashing Replacement: As directed by the Architect, replace sections of through-wall flashing a specified in Section 076200 and the Structural Drawings. .
1. Description: Removal and disposal of sections of through-wall flashing and replace with new through-wall flashing as indicated.
 2. Unit of Measurement: Linear Foot (LF).
 3. Include in the Base Bid the quantities depicted on the drawings.
- I. Unit Price No. 11 - "Add" and "Deduct" Unit Prices for Wood Door Panel Replacement: As directed by the Architect, replace sections of existing wood door panels as specified in Section 081433.
1. Description: Removal and disposal of sections of deteriorated wood door panel materials and replace with new materials to match existing..
 2. Unit of Measurement: Square Foot (SF).
 3. Include in the Base Bid the total of 24 SF of replacement.
- J. Unit Price No. 12 - "Add" and "Deduct" Unit Prices for Wood Door Moldings, Casings and Trim Replacement: As directed by the Architect, replace sections of existing wood door moldings, casings and trim as specified in Section 081433.

1. Description: Removal and disposal of sections of deteriorated wood door moldings, casings and trim, and replace with new materials to match existing..
 2. Unit of Measurement: Linear Foot (LF).
 3. Include in the Base Bid the total of 48 LF of replacement.
- K. Unit Price No. 13 - "Add" and "Deduct" Unit Prices for Brick Crack Repairs: As directed by the Architect, make repairs at brick wall cracks in accordance with Section 040120 and Structural Drawings.
1. Description: Repairs to existing brick wall cracks.
 2. Unit of Measurement: Linear Foot (LF).
 3. Include in the Base Bid the the quantities depicted on the drawings.
- L. Unit Price No. 14 - "Add" and "Deduct" Unit Prices for Wood Nailer Replacement: As directed by the Architect, remove existing wood nailers and replace with new preservative treated wood nailers, including fasteners, as specified in Section 061000.
1. Description: Removal and replacement of deteriorated wood nailers and replacement with pressure treated nailers and fasteners..
 2. Unit of Measurement: Linear Foot (LF).
 3. Include in the Base Bid the total of 200 LF of 2 x 8-inch pressure treated wood blocking replacement.

END OF SECTION 012200

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Refer to DPMC bidding documents for the project construction duration from the date of the Notice to Proceed that is issued by the State of New Jersey.
- B. Refer to State of New Jersey General Conditions for specific schedule requirements.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of named products for use in Project.
- B. Submit the following for the Architect's review and action:
 - 1. Shop drawings.
 - 2. Product data.
 - 3. Samples.
 - 4. Submittals for which procedures are not defined elsewhere.
- C. Specific submittals required are described in individual sections.
- D. Related Sections include the following:
 - 1. Division 0 Section "State of New Jersey Instructions to Bidders & General Conditions" for procedures for products proposed that are not named in the specifications.
 - 2. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
 - 3. Divisions 2 through 26 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

- B.. "Shop drawings" are drawings and other data prepared, by the entity who is to do the work, specifically to show a portion of the work.
- C. "Product data submittals" are standard printed data which show or otherwise describe a product or system, or some other portion of the work.
- D. "Samples" are actual examples of the products or work to be installed.
- E. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- F. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 FORM OF SUBMITTALS

- A. Utilize standard State of New Jersey DPMC/OCS 12/13 forms for identification of sub-contractors and products; submit original and 8 copies.
- B. Manufacturer's Product Data: Utilize State of New Jersey DBC-13 form for transmittal of product data, shop drawings and samples; submit original and 8 copies.
- C. Sheets Larger than 8-1/2 x 11-inches: Sheet size: 24 x 36-inch maximum; submit original and 8 copies.
- D. Small Sheets or Pages: Sheet size 8-1/2 x 11-inch minimum, 11 x 17-inch maximum; submit original and 8 copies.
- E. Samples: Submit 9 samples; each sample shall be labeled.
- F. If additional sets are needed by other entities involved in work represented by the samples, submit with original submittal.
- G. Copies in excess of the number requested will not be returned.
- H. Provide additional copies for project record documents.

1.5 COORDINATION OF SUBMITTALS

- A. Coordinate submittals and activities that must be performed in sequence, so that the Architect has enough information to properly review the submittals.
- B. Coordinate submittals of different types for the same product or system so that the Architect has enough information to properly review each submittal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TIMING OF SUBMITTALS

- A. Transmit each submittal at or before the time indicated on the approved schedule of submittals. In general, all submittals must be completed within 20 calendar days from the date of the Notice to Proceed.
 - 1. Prepare and submit for approval a schedule showing the required dates of submittal of all submittals.
 - 2. Organize the schedule by the applicable specification section number.
 - 3. Incorporate the contractor's construction schedule specified elsewhere.
 - 4. Revise and resubmit the schedule for approval when requested.
- B. Deliver each submittal requiring approval in time to allow for adequate review and processing time, including resubmittals if necessary; failure of the Contractor in this respect will not be considered as grounds for an extension of the contract time.
- C. If a submittal must be processed within a certain time in order to maintain the progress of the work, state so clearly on the submittal.
- D. If a submittal must be delayed for coordination with other submittals not yet submitted, the Architect may at his option either return the submittal with no action or notify the Contractor of the other submittals which must be received before the submittal can be reviewed.

3.2 SUBMITTAL PROCEDURES - GENERAL

- A. Contractor Review: Sign each copy of each submittal certifying that Contractor has reviewed the submittal and that it complies with the requirements of the contract documents. Submittals received without this information will be returned without being reviewed. In the case of substitution requests submittals without this information will be rejected.
- B. Notify the Architect, in writing and at time of submittal, of all points upon which the submittal does not conform to the requirements of the contract documents, if any.
- C. Do not commence work which requires review of any submittals until receipt of returned submittals with an acceptable action.
- D. Do not allow submittals without an acceptable action marking to be used for the project.
- E. Do not submit substitute items that have not been approved by means of the procedure specified elsewhere.
- F. Preparation of Submittals:
 - 1. Follow DPMC procedures for all submittals.
 - 2. Label each copy of each submittal, with the following information:
 - a. Project name and DPMC project number.
 - b. Date of submittal.

- c. Contractor's name and address.
 - d. Subcontractor's name and address.
 - e. Supplier's name and address.
 - f. Manufacturer's name.
 - g. Specification section where the submittal is specified.
 - h. Other necessary identifying information.
- 2. Pack submittals suitably for shipment.
 - 3. Submittals to receive Architect's action marking: Provide blank space on the label or on the submittal itself for action marking; minimum 4 inches wide by 5 inches high.

G. Transmittal of Submittals:

- 1. Submit all submittals to the Architect, with copy of transmittal to DPMC Construction Manager.
- 2. Submittals will be accepted from the Contractor only. Submittals received from other entities will be returned without review or action.
- 3. Submittals received without a transmittal form will be returned without review or action.
- 4. Transmittal form: Use DPMC 12/13 (no substitutions).
- 5. Fill out a separate transmittal form for each submittal; also include the following:
 - a. Other relevant information.
 - b. Requests for additional information.

3.3 SHOP DRAWINGS

A. Content: Include the following information:

- 1. Dimensions, at accurate scale.
- 2. All field measurements that have been taken, at accurate scale.
- 3. Names of specific products and materials used.
- 4. Show compliance with the specific standards referenced.
- 5. Coordination requirements; show relationship to adjacent or critical work.
- 6. Name of preparing firm.

B. Preparation:

- 1. Reproductions of contract documents are not acceptable as shop drawings.
- 2. Identify as indicated for all submittals.
- 3. Space for Architect's action marking shall be adjacent to the title block.

3.4 PRODUCT DATA

A. Submit all product data submittals for each system or unit of work as one submittal.

B. Content:

- 1. Submit manufacturer's standard printed data sheets.
- 2. Identify the particular product being submitted; submit only pertinent pages.
- 3. Show compliance with properties specified.

4. Identify which options and accessories are applicable.
5. Include recommendations for application and use.
6. Show compliance with the specific standards referenced.
7. Show compliance with specified testing agency listings; show the limitations of their labels or seals, if any.
8. Identify dimensions which have been verified by field measurement.
9. Show special coordination requirements for the product.

3.5 SAMPLES

A. Samples:

1. Provide samples that are the same as proposed product.
2. Where products are to match a sample prepared by other entities, prepare sample to match.

B. Preparation:

1. Attach a description to each sample.
2. Attach name of manufacturer or source to each sample.
3. Where compliance with specified properties is required, attach documentation showing compliance.
4. Where there are limitations in availability, delivery, or other similar characteristics, attach description of such limitations.

3.6 REVIEW OF SUBMITTALS

- #### A. Submittals for approval will be reviewed, marked with appropriate action, and returned.

3.7 RETURN, RESUBMITTAL, AND DISTRIBUTION

- #### A. Submittals will be returned to the Contractor by mail or at periodic project meetings.

- #### B. Perform resubmittals in the same manner as original submittals; indicate all changes other than those requested by the Architect.

C. Distribution:

1. Distribute returned submittals to all subcontractors and suppliers involved in work covered by the submittal.
2. Make extra copies for operation and maintenance data submittals, as required.
3. Record distribution on transmittal form with copy to the Architect.

3.8 REQUIRED SUBMITTALS

- #### A. Refer to each specification section. A detailed list will be provided upon award of contract.

END OF SECTION 013300

SECTION 013591 - HISTORIC TREATMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes special procedures for historic treatment on Project including, but not limited to, the following:
 - 1. Storage and protection of existing historic materials.
 - 2. Temporary protection of historic materials during construction.
 - 3. Protection during use of heat-generating equipment.
 - 4. Historic treatment procedures.
- B. Related Sections include the following:
 - 1. Division 01 Section "Construction Progress Documentation" for preconstruction photographs taken before historic treatment.
 - 2. Division 01 Section "Submittal Procedures" for procedures related to the submittal requirements for existing materials.

1.3 DEFINITIONS

- A. "Restoration": To accurately depict the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and the reconstruction of missing features from the restoration period.
- B. "Stabilize": To apply measures designed to reestablish a weather-resistant enclosure and the structural reinforcement of an item or portion of the building while maintaining the essential form as it exists at present.
- C. "Protect and Maintain": To remove deteriorating corrosion, reapply protective coatings, and install protective measures such as temporary guards; to provide the least degree of intervention.
- D. "Repair": To stabilize, consolidate, or conserve; to retain existing materials and features while employing as little new material as possible. Repair includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials. Within restoration, repair also includes limited replacement in kind, rehabilitation, and reconstruction, with compatible substitute materials for deteriorated or missing parts of features when there are surviving prototypes.

- E. "Replace": To duplicate and replace entire features with new material in kind. Replacement includes the following conditions:
 - 1. Duplication: Includes replacing elements damaged beyond repair or missing. Original material is indicated as the pattern for creating new duplicated elements.
 - 2. Replacement with New Materials: Includes replacement with new material when original material is not available as patterns for creating new duplicated elements.
 - 3. Replacement with Substitute Materials: Includes replacement with compatible substitute materials. Substitute materials are not allowed, unless otherwise indicated.
- F. "Remove": To detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- G. "Remove and Salvage": To detach items from existing construction and deliver them to Owner ready for reuse.
- H. "Remove and Reinstall": To detach items from existing construction, repair and clean them for reuse, and reinstall them where indicated.
- I. "Existing to Remain" or "Retain": Existing items of construction that are not to be removed and that are not otherwise indicated to be removed and salvaged, or removed and reinstalled.
- J. "Material in Kind": Material that matches existing materials, as much as possible, in species, cut, color, grain, and finish.
- K. "Rehabilitation": The process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values."

1.4 SUBMITTALS

- A. Alternative Methods and Materials: If alternative methods and materials to those indicated are proposed for any phase of work, provide a written description including evidence of successful use on other, comparable projects, and program of testing to demonstrate effectiveness for use on this Project.
- B. Qualification Data: For historic treatment specialists and supervisory personnel. Include list of completed projects with the scope of work and budget for each.

- C. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by historic treatment operations. Submit before work begins.
- D. Record Documents: Include documents indicating locations of steel tracks, lintels, doors, frames, bolts, eyelets, etc., including elevations , sections and dimensions.

1.5 QUALITY ASSURANCE

- A. Historic Treatment Specialist Qualifications: A firm that employs personnel, including supervisory personnel, experienced and skilled in the processes and operations indicated.
- B. Historic Treatment Preconstruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
 - 1. Review manufacturer's written instructions for precautions and effects of products and procedures on building materials, components, and vegetation.
 - a. Record procedures established as a result of the review and distribute to affected parties.

1.6 STORAGE AND PROTECTION OF HISTORIC MATERIALS

- A. Removed and Salvaged Historic Materials:
 - 1. Clean salvaged historic items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area on-site as designated by Owner.
 - 5. Protect items from damage during transport and storage.
 - 6. Do not dispose of items removed from existing construction without prior written consent of Owner.
- B. Removed and Reinstalled Historic Materials:
 - 1. Clean and repair historic items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations found. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
 - 5. Provide record documents indicating location of steel items.

- C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling during historic treatment. When permitted by Architect, items may be removed to a suitable, protected storage location during historic treatment and cleaned and reinstalled in their original locations after historic treatment operations are complete.
- D. Storage and Protection: When removed from their existing location, store historic materials within a weathertight enclosure where they are protected from wetting by rain, snow, or ground water, and temperature variations. Secure stored materials to protect from theft.
 - 1. Identify removed items with an inconspicuous mark indicating their original location.

1.7 PROJECT-SITE CONDITIONS

- A. Exterior Cleaning and Repairing:
 - 1. Proceed with the work only when forecasted weather conditions are favorable.
 - a. Wet Weather: Do not attempt repairs during rainy or foggy weather. Do not apply primer, paint, putty, or epoxy when the relative humidity is above 80 percent. Do not remove exterior elements of structures when rain is forecast or in progress.
 - b. Do not perform exterior wet work when the air temperature is below 40 deg F.
 - c. Do not begin cleaning, patching, or repairing when there is any likelihood of frost or freezing.
 - d. Do not begin cleaning when either the air or the surface temperature is below 45 deg F unless approved means are provided for maintaining a 45 deg F temperature of the air and materials during, and for 48 hours subsequent to, cleaning.
 - 2. Perform cleaning and rinsing of the exterior only during daylight hours.
- B. Templates: Contractor shall save all items that are to be used as templates for fabricating new items that will match existing historic building elements. Contractor shall have templates on site and make available to the Architect and the State whenever requested to verify that the newly fabricated components match the templates.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION, GENERAL

HISTORIC TREATMENT PROCEDURES

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- A. Comply with manufacturer's written instructions for precautions and effects of products and procedures on adjacent building materials, components, and vegetation.
- B. Ensure that supervisory personnel are present when work begins and during its progress.
- C. Temporary Protection of Historic Materials during Construction:
 - 1. Protect existing materials during installation of temporary protections and construction. Do not deface or remove existing materials.
 - 2. Attachments of temporary protection to existing construction shall be approved by Architect prior to installation.
- D. Protect landscape work adjacent to or within work areas as follows:
 - 1. Provide barriers to protect tree trunks.
 - 2. Bind spreading shrubs.
 - 3. Use coverings that allow plants to breathe and remove coverings at the end of each day. Do not cover plant material with a waterproof membrane for more than 8 hours at a time.
 - 4. Set scaffolding and ladder legs away from plants.

3.2 PROTECTION DURING USE OF HEAT-GENERATING EQUIPMENT

- A. Comply with the following procedures while performing work with heat-generating equipment, including welding, cutting, soldering, brazing, paint removal with heat, and other operations where open flames or implements utilizing heat are used:
 - 1. Obtain Owner's approval for operations involving use of open-flame or welding equipment.
 - a. Notification shall be given for each occurrence and location of work with heat-generating equipment.
 - 2. As far as practical, use heat-generating equipment in shop areas or outside the building.
 - 3. Before work with heat-generating equipment commences, furnish personnel to serve as a fire watch for location(s) where work is to be performed.
 - 4. Remove and keep the area free of combustibles, including, rubbish, paper, waste, etc., within area of operations.
 - a. If combustible material cannot be removed, provide fireproof blankets to cover such materials.
 - 5. Where possible, furnish and use baffles of metal or gypsum board to prevent the spraying of sparks or hot slag into surrounding combustible material.
 - 6. Prevent the extension of sparks and particles of hot metal through open doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.

7. Inspect each location of the day's work not sooner than 30 minutes after completion of operations to detect hidden or smoldering fires and to ensure that proper housekeeping is maintained.

3.3 HISTORIC TREATMENT PROCEDURES

- A. The principal aim of preservation work is to halt the process of deterioration and stabilize the item's condition, unless otherwise indicated. Repair is required where specifically indicated. The following procedures shall be followed:
 1. All work is required to comply with the Secretary of the Interior's "Standards for the Treatment of Historic Properties" and "Standards for Rehabilitation".
 2. Retain as much existing material as possible; repair and consolidate rather than replace.
 3. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
 4. Use reversible processes wherever possible.
 5. Use traditional replacement materials and techniques. New work shall be distinguishable to the trained eye, on close inspection, from old work.
 6. Record the work before the procedure with preconstruction photos and during the work with periodic construction photos. Photographic documentation is specified in Division 01 Section "Photographic Documentation."
- B. Prohibit smoking by personnel performing work on or near historic structures.
- C. Obtain Architect's review and written approval in the form of a Constructive Change Directive or Supplemental Instruction before making changes or additions to construction or removing historic materials.
- D. Notify Architect of visible changes in the integrity of material or components whether due to environmental causes including biological attack, UV degradation, freezing, or thawing; or due to structural defects including cracks, movement, or distortion.
 1. Do not proceed with the work in question until directed by Architect.
- E. Where missing features are indicated to be repaired or replaced, provide features whose designs are based on accurate duplications rather than on conjectural designs, subject to the approval of Architect and Preservation Specialist.
- F. Where Work requires existing features to be removed, cleaned, and reused, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.
- G. Identify new or replacement materials and features with inconspicuous, permanent marks to distinguish them from original materials. Record the legend of identification marks and the locations of these marks on Record Drawings.

- H. When cleaning, match samples of existing materials that have been cleaned and identified for acceptable cleaning levels. Avoid overcleaning to prevent damage to existing materials during cleaning.
- I. Mark all items to be used as templates for Architects' and States' review and approval. Proceed with fabrication only after approval of template being used is given.
- J. During any excavations the park historian or an archeologist shall be present. If any artifacts are discovered during excavation all work shall stop immediately and the Contractor shall wait to be advised by the park historian/archeologist, the Architect, and the State for further direction.

END OF SECTION 013591

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions , and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
 - 2. Divisions 2 through 26 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products

incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.

- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
- E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- I. Testing Agency: A DPMC prequalified entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

1.4 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence,

records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: A DPMC pre-qualified testing agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect or Construction Manager.
 2. Notify Architect and Construction Manager seven days in advance of dates and times when mockups will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 4. Obtain Architect's and Construction Manager's approval of mockups before starting work, fabrication, or construction.

- a. Allow seven days for initial review and each re-review of each mockup.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 QUALITY CONTROL

- A. Contractor Responsibilities: Where quality-control services are indicated as Contractor's responsibility, Contractor will engage a DPMC pre-qualified testing agency to perform these services at their own expense.
 1. Contractor will furnish testing agency engaged a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, Contractor to provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services at contractor's own expense.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.8 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Conducted by a DPMC prequalified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying Architect, Construction Manager, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's and Construction Manager's reference during normal working hours.

3.2 REPAIR AND PROTECTION

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

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Refer to Section 011400 "Building Security and Contractor Use of the Premises" for information regarding services.
- C. Electric Power Service from Existing System: Refer to Section 011400 "Building Security and Contractor Use of the Premises" for information regarding services.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Refer to Section 011400 "Building Security and Contractor Use of the Premises" for information regarding fencing. Provide galvanized-steel bases for supporting posts.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where indicated in the documents, will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
1. Locate facilities to limit site disturbance as specified in Section 011400 "Building Security and Contractor Use of the Premises".
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Refer to Section 011400 “Building Security and Contractor Use of the Premises” for information regarding services. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Refer to Section 011400 “Building Security and Contractor Use of the Premises” for information regarding services. Provide temporary toilets, wash facilities, and drinking water for use of construction personnel for the duration of the work. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
- E. Electric Power Service: Refer to Section 011400 “Building Security and Contractor Use of the Premises” for information regarding services. Maintain equipment in a condition acceptable to Owner.
- F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Section 311000 "Site Clearing."
- D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- E. Site Enclosure Fence: Refer to Section 011400 "Building Security and Contractor Use of the Premises" for information regarding fencing.
1. Extent of Fence: As indicated on Drawings.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish five (5) set of keys to Owner.
- F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
- H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.4 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 - 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; and special warranties.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Requirements" for products proposed that are named in the specifications.
 - 2. Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.
 - 3. Divisions 2 through 26 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

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

in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

- B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

- C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Refer to Divisions 2 through 26 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
 7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.

2.2 PRODUCT SUBSTITUTIONS

- A. Refer to Division 1 Section "Substitutions".

2.3 COMPARABLE PRODUCTS

- A. Conditions: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. General installation of products.
 - 3. Progress cleaning.
 - 4. Starting and adjusting.
 - 5. Protection of installed construction.
 - 6. Correction of the Work.
- B. Related Sections include the following:
 - 1. Division 1 Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
 - 2. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services into and throughout each building.
- B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

- a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings. If discrepancies are discovered, notify Architect and Construction Manager promptly.
- B. General:
 1. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 2. Inform installers of lines and levels to which they must comply.
 3. Check the location, level and plumb, of every major element as the Work progresses.
 4. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Make the log available for reference by Architect and Construction Manager.

3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.7 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

3.8 RESTORATION

- A. Prior to initiating work the Contractor is responsible for photographing existing building and site features to document existing conditions. Provide three (3) sets of photographs to DPMC representative.
- B. Periodically and at completion of the project the Contractor shall restore building and site features that are disturbed by the work of the Contractor, to pre-construction conditions.
- C. Client Agency, DPMC and Architect will determine satisfactory level of restoration.

END OF SECTION 017300

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
 - 1. Divisions 2 through 26 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - a. Requirements in this Section apply to all cutting and patching unless superseded by other sections of the specifications. In general, restore all areas that have been disturbed to their original finish.

1.3 DEFINITIONS

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 6. Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Those components include, but are not limited to the following:
 - 1. Primary operational systems and equipment.
 - 2. Air or smoke barriers.
 - 3. Fire-protection systems.
 - 4. Control systems.
 - 5. Communication systems.
 - 6. Electrical wiring systems.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 - 1. Water, moisture, or vapor barriers.
 - 2. Membranes and flashings.
 - 3. Equipment supports.
 - 4. Piping, ductwork, vessels, and equipment.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
 - 1. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm.
- E. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- F. Temporary Removal and Reinstallation of Ceilings: At locations where existing acoustical tile ceilings need to be removed to allow access for ductwork revisions and/or electrical work, follow the following procedures:
 - 1. Photograph existing conditions prior to initiating work.
 - 2. Carefully remove and store the acoustical tile system ceiling panels and grid.
 - 3. Upon completion of above ceiling work, reinstall the acoustical ceiling system so that there is no evidence that work had been performed.
 - 4. Replace any damaged products or unacceptable installation practice with new products to match existing.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 5. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

END OF SECTION 017329

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Equipment start-up, demonstration and commissioning.
 - 4. Final cleaning.
- B. Related Sections include the following:
 - 1. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and other Specification Sections, apply to this Section.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 8. Complete startup testing of systems.
 - 9. Submit test/adjust/records.
 - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 11. Complete final cleaning requirements, including touchup painting.

12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit five copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding with interior spaces by room number and name.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:

- a. Project name and DPMC Project Number.
- b. Date.
- c. Name of Architect.
- d. Name of Contractor.
- e. Page number.

1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8 ½ by 11 inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Remove labels that are not permanent.
 - i. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 1. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017823 - MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing maintenance manuals, including the following:
 - 1. Maintenance documentation directory.
 - 2. Maintenance manuals for the care and maintenance of products and systems.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for maintenance manuals.
 - 2. Division 1 Section "Closeout Procedures" for submitting maintenance manuals.
 - 3. Division 1 Section "Project Record Documents" for preparing Record Drawings for maintenance manuals.
 - 4. Divisions 2 through 26 Sections for specific maintenance manual requirements for the Work in those Sections.

1.3 SUBMITTALS

- A. Initial Submittal: Submit 5 draft copies of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.
- B. Final Submittal: Submit 6 copies of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.
 - 1. Correct or modify each manual to comply with Architect's comments. Submit 6 copies of each corrected manual within 15 days of receipt of Architect's comments.

1.4 COORDINATION

- A. Where maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 MAINTENANCE DOCUMENTATION DIRECTORY

- A. Organization: Include a section in the directory for each of the following:
 - 1. List of documents.
 - 3. Table of contents.
- B. Tables of Contents: Include a table of contents for each maintenance manual.
- C. Identification: In the documentation directory and in each maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents."

2.2 MANUALS, GENERAL

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each component. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name, address, and telephone number of Contractor.
 - 6. Name and address of Architect.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
 - 1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

- b. Identify each binder on front and spine, with printed title "MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
 1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations.
- E. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency and maintenance manuals.

- B. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper maintenance of equipment or systems.

- C. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original Project Record Documents as part of maintenance manuals.
 - 2. Comply with requirements of newly prepared Record Drawings in Division 1 Section "Project Record Documents."

- D. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Product Data.
 - 3. Operation and Maintenance Data.
- B. Related Sections include the following:
 - 1. Division 1 Section "Closeout Procedures" for general closeout procedures.
 - 2. Division 1 Section "Maintenance Data" for maintenance manual requirements.
 - 3. Divisions 2 through 26 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up Record Prints.
- B. Record Product Data: Submit nine (9) copies of each Product Data submittal.
 - 1. Where Record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
 - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Actual equipment locations.
 - d. Changes made by Change Order or Construction Change Directive.
 - e. Changes made following Architect's written orders.
 - f. Details not on the original Contract Drawings.
 - g. Field records for variable and concealed conditions.
 - h. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders and Record Drawings where applicable.

2.3 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION 017839

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Predemolition Photographs or Video: Submit before Work begins.
- C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.5 CLOSEOUT SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- F. Storage or sale of removed items or materials on-site is not permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.
- D. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
- E. Survey of Existing Conditions: Record existing conditions by use of measured drawings preconstruction photographs.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. 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. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
5. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 028200 – ASBESTOS ROOFING SYSTEM ABATEMENT

PART 1 – GENERAL

1.1 General and Supplementary General Conditions, and the Contract Drawings apply to this Section.

- A. Section 074213 – Metal Wall Panels
- B. Section 075200 – SBS MBM Roofing
- C. Section 076200 – Sheet Metal Flashing and Trim

1.2 SCOPE OF WORK:

A. Site:

State Office Building
135 West Hanover Street
Trenton, Mercer County, NJ

B. Description of Work:

1. Work consists of the removal and disposal of approximately 1,768 square feet of asbestos-containing tar/asphalt on parapet and curbs under grey mineral coat flashing; and 116 linear feet of tar at seams of copper penthouse walls, as indicated in the Contract Documents.
2. The scope shall include removal of all residue and persistent materials to accommodate installation of the new materials. If present, all residues shall be removed from any porous substrate material where asbestos tar materials exist (concrete, metal, wood, etc.) via methods utilized to maintain the non-friable nature of the asphaltic materials (i.e. grinding shall not be allowed). Asbestos tar materials adhered to metal surfaces shall be removed by dissolution of the residue, or disposal of the substrate element as asbestos waste if that element were to be removed as part of the renovations. Residue and stained substrate elements may be left in place only where they will not interfere with the installation of the new systems.
3. The Contractor shall be responsible for all cleaning and asbestos decontamination required to complete the specified abatement as well as any cleaning and asbestos decontamination that may be required due to the abatement activities.
4. The Contractor is expected to have acquainted itself with the building involved, and to have investigated the location and amount of all identified materials. Information regarding quantification anywhere in the Contract Documents shall not in any way be construed or applied so as to limit the Contractor's obligation to remove and dispose of, or otherwise treat as specified, all ACM so identified, nor to form the basis of any change of the Contract Sum or Time.

5. The Contractor shall be responsible for overall coordination of the Asbestos Abatement Work with the general roof replacement work.
6. The Contractor shall complete the Asbestos Abatement Work according to a schedule to accommodate the roof replacement schedule, removing ACM to accommodate daily activities but not to otherwise cause any portion of either facility to unduly remain unprotected to weather for any period of time.

1.3 DEFINITIONS:

- A. Asbestos Abatement Work – Shall be defined as that work which encompasses the specified removal of asbestos-containing materials, all preparatory and cleaning activities associated with or otherwise motivated by the removal activities, and the handling, transportation and disposal of asbestos-containing and asbestos-contaminated materials. The term “work” may be utilized herein, and throughout Section 028200 to refer to Asbestos Abatement Work.
- B. Category I Nonfriable Asbestos-Containing Material – Means asbestos-containing packings, gaskets, resilient floor covering (vinyl asbestos tile (VAT)), and asphalt roofing products containing more than one (1) percent asbestos as determined using methods specified in appendix A, subpart F, 40 C.F.R. Part 763, Section 1, Polarized Light Microscopy.

1.4 OWNER’S RIGHT TO CARRY OUT ASBESTOS ABATEMENT WORK:

- A. If the Contractor and/or Sub-Contractor neglects to carry out the activities related to the Asbestos Abatement Work, which would cause endangerment to public health, the Owner may, with 24 hour notice to the Contractor act to correct such deficiencies.
- B. In the above cases an appropriate Change Order or Construction Change Directive shall be issued deducting from payments then or thereafter due to the Contractor the cost of correcting such deficiencies, including compensation for the Architect’s/Asbestos Abatement Consultant’s additional services and expenses made necessary by such default, neglect, or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

1.5 DOCUMENTATION:

- A. Construction Permit
 1. The Contractor shall be responsible for obtaining a construction permit in accordance with N.J.A.C. 5:23-2, if applicable.
- B. Regulatory Compliance
 1. The Contractor shall furnish documentation to the building Owner or his designated representative that the firm and its employees are familiar with the following regulations of the United States Department of Labor, Occupational Safety and Health Administration (OSHA) and the United States Environmental Protection Agency (EPA) relating to the application, removal, disposal, and treatment of asbestos:

- a. OSHA regulations, namely: 29 CFR 1910.1001, 29 CFR 1926.58 and 29 CFR 191.134, Respiratory Protection and 29 CFR 1910.20, Access to Employee Exposure and Medical Records.
 - b. EPA regulations, namely: Subparts A and M of 40 CFR Part 61, National Emissions Standards for Hazardous Air Pollutants.
2. The Contractor shall be responsible for controlling access at the work site and shall maintain a daily log of personnel conducting asbestos removal activities. A list of worker names shall be posted with their start and stop times for each day. Copies of the daily log shall be given to the Project Monitor at the end of the project.
 3. The Contractor shall strictly adhere to all precautions necessary for the safety and health of workers in accordance with provisions of OSHA Standards 29 CFR Part 1926, Construction Standards, and 29 CFR 1910, General Industry Standards. The applicable parts of NIOSH Health Hazard Evaluation Report Number HETA 84-321-1590 shall be adhered to.

C. Preconstruction Submittals

4. The Contractor is required to submit the following documentation prior to starting the asbestos removal project:
 - a. Documentation in accordance with 1.5 B. 1. of this Section.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 REMOVAL OF ASBESTOS-CONTAINING ROOFING MATERIALS:

- A. Pursuant to specific exclusion made by the New Jersey Administrative Code promulgated pursuant to the New Jersey Asbestos Control and Licensing Act, the removal of asbestos-containing roofing materials specified may be completed by a competent party other than a licensed asbestos abatement contractor (see N.J.A.C. 12:120-1.4(b) (5) and N.J.A.C. 8:60-1.5 (b) (5)). Therefore, the Contractor, if a roofing contractor, or other competent party may complete the roofing material removal.
- B. Roofing material removal shall be completed pursuant to N.J.A.C. 5:23-8.20 (c) and applicable OSHA Construction Standards.
- C. The Owner reserves the right to conduct monitoring of the roofing material removal activities, holding the Subcontractor and Contractor responsible for cleaning activities resulting from improper handling of debris and waste and/or the receipt of unacceptable air sampling results, in accordance with the contingency plan criteria promulgated by the New Jersey Asbestos Hazard Abatement Subcode (N.J.A.C. 5:23-8) for an “asbestos hazard abatement project”. The Owner’s sampling may include progress sampling and/or clearance air sampling both inside the building and outside of the building at the work site perimeter.

- D. The Contractor shall be responsible for controlling access into the secured area to properly trained and protected personnel only.
- E. The asbestos-containing materials shall be removed by two person teams. The first worker shall continually mist the material with amended water; the second shall remove the materials from their existing substrate.

3.2 DISPOSAL OF ASBESTOS-CONTAINING ROOFING MATERIALS

- A. All asbestos waste materials shall be subject to approval of the registered landfill.
- B. Category I nonfriable asbestos material that is not in poor condition and is not friable may be managed and disposed of as either:
 - 1. ID 13C – Construction and Demolition Debris; or
 - 2. ID 27A – Dry Industrial Waste (asbestos or asbestos containing).
- C. ID 27A which is properly packaged (is classified as Waste Identification 27A non-hazardous industrial waste) can be disposed of at a landfill which is registered by the New Jersey Department of Environmental Protection in conformance with the following:
 - 1. The landfill used must be registered by the New Jersey Department of Environmental Protection to accept ID 27A.
 - 2. The specific landfill facility chosen must be the one designated by the New Jersey Department of Environmental Protection as the recipient facility for the community in which the removal project is located. To determine which facility to use for a particular project, contact the Division of Solid Waste Management at (609)-530-8896, or consult the New Jersey Waste Flow Regulations (N.J.A.C. 7:26-2).
 - 3. The waste hauler must possess a valid solid waste transporter registration issued by the New Jersey Department of Environmental Protection. A licensed solid waste transporter shall be a commercial collector/hauler or shall be the Contractor if they are so registered.
- D. The Contractor shall supply to the Owner the original “Generator’s Copy” of the Waste Manifest within ten (10) business days of receipt of the loads at the designated landfill.

3.3 GENERAL WORK PROCEDURES:

- A. Removal of roofing materials should be done at a time of minimum building occupancy. If this is not feasible, all doors and windows should be kept closed during tear-off and cleanup operations. Fresh air intakes for heating, ventilation and air conditioning systems will be ducted, re-routed and filtered as required to provide fresh air free of asbestos contamination.
- B. Critical barriers, consisting of a minimum of two (2) layers of fire retardant, six (6) mil polyethylene sheeting as tested by ASTM standard E-84, shall be installed on all openings of the roof. The polyethylene barriers shall be replaced or repaired if torn or damaged.

- C. ID 27A waste container shall be properly lined with two (2) layers of six (6) mil polyethylene sheeting before any asbestos removal takes place.
- D. The non-friable asbestos-containing material removed shall not be dropped more than ten (10) feet. If the height of the roof is greater than ten (10) feet the Contractor shall either lower the material from the roof or use an enclosed chute directly into the waste container. These arrangements should be put into place before any asbestos removal takes place.
- E. The asbestos waste must be placed directly into the removal container. The storage of asbestos waste, unless in an authorized container, will not be permitted.
- F. To help minimize airborne levels of asbestos fibers, the roofing materials should be misted with water or other appropriate wetting agent before tear off. Damage caused by water over-spraying shall be the responsibility of the Contractor.
- G. Any power tools used to drill, cut into, or otherwise disturb asbestos material shall be equipped with HEPA-filtered local exhaust ventilation.

END OF SECTION 028200

SECTION 028213 – REMOVAL AND DISPOSAL OF ASBESTOS-CONTAINING MATERIALS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. General and Supplementary General Conditions, and the Contract Drawings apply to this Section.
- A. Section 074213 – Metal Wall Panels
- B. Section 075200 – SBS MBM Roofing
- C. Section 076200 – Sheet Metal Flashing and Trim
- D. Section 081113 – Hollow Metal Doors & Frames
- E. Section 085250 – Single Hung Wood Windows

1.2 CONTRACTOR REQUIREMENTS AND QUALIFICATIONS

- A. All work involving the removal and disposal of asbestos-containing materials shall be accomplished by a State of New Jersey, Department of Labor and Workforce Development (NJDOLE), licensed Asbestos Abatement Contractor.
- B. All employees shall possess and maintain on their person a valid asbestos worker or supervisor certification issued by the State of New Jersey, Department of Labor and Workforce Development, while working on this project.
- C. The Contractor shall furnish evidence that each worker and supervisor has been given medical examinations and respiratory fit tests within the previous twelve (12) months in accordance with United States Department of Labor, Occupational Safety and Health Administration (OSHA) 29 CFR 1910 and 29 CFR 1926 requirements.
- D. The Contractor shall be responsible for securing the work area(s) at the end of the shift, and all on-site waste containers/dumpsters. In addition, failure to comply with all site health and safety requirements, these Technical Specifications, and all applicable local, State and Federal regulations will require issuance of a Stop Work order by the Owner's Representative.
- E. Prior to commencement of work, the Contractor shall inspect areas in which work is to be performed. Prepare a listing of damage to structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from the work. Photograph or videotape existing conditions as necessary to document conditions. Submit a copy of these photos or tapes to the Owner's Representative prior to starting work.
- F. All electrical connections, except to outlets and extension cords, will require the Contractor to utilize a licensed Electrician.

- G. In buildings required by the Uniform Construction Code (UCC) to be of noncombustible construction, all materials used to construct separation barriers must meet the UCC, building subcode requirements for that building. Polyethylene sheeting shall be a nominal six (6) mil and must be flame resistant.

1.3 NOTIFICATIONS

- A. Send written notification as required by USEPA, National Emission Standards for Hazardous Air Pollutants (NESHAP), Asbestos Regulations (40 CFR, Part 61, Sub-part M), to the regional asbestos NESHAP Contact at least ten (10) business days prior to beginning any work on asbestos-containing materials. Send notification to the following address for REGION 2, as applicable:

1. United States Environmental Protection Agency- Region 2
Division of Enforcement and Compliance Assistance
Air Compliance Branch (DECA-ACB)
290 Broadway - 21st Floor
New York, NY 10007-1866

Send written notifications to the State Agencies listed, as applicable:

2. New Jersey Department of Environmental Protection
Division of Solid and Hazardous Waste
P.O. Box 414
Trenton, NJ 08625-0414
3. New Jersey Department of Community Affairs
Division of Codes and Standards
Asbestos Safety Unit
101 South Broad Street
P.O. Box 816
Trenton, NJ 08625-0816
4. New Jersey Department of Health and Senior Services
Indoor Environments Program
Consumer and Environmental Health Services
P.O. Box 360
Trenton, NJ 08625-0360
5. New Jersey Department of Labor & Workforce Development
Division of Public Safety & Occupational Safety & Health
Asbestos Control & Licensing Section
1 John Fitch Plaza
P.O. Box 949
Trenton, NJ 08625-0949

1.4 CONTRACTOR SUBMITTALS

- A. The Asbestos Abatement Contractor shall submit the following information to the Owner's representative prior to mobilization at the worksite:
 - 1. Notification forms submitted to State and Federal agencies;
 - 2. Inspection report of existing site conditions;
 - 3. Supervisor's license;
 - 4. Written Respiratory Protection Program and proof of OSHA compliance with 29 CFR 134;
 - 5. Safety Data Sheets (SDS) for all chemical agents brought onto the site;

- B. After completion of work on this project the Asbestos Abatement Contractor shall submit the following information to the Owner:
 - 1. Daily activity reports and personnel sign-in sheets
 - 2. Minutes of meetings
 - 3. Visitations; authorized and unauthorized
 - 4. Special or unusual events
 - 5. Waste material disposal manifests

1.5 DEFINITIONS

- A. The following words, terms and abbreviations, when used in this section, shall have the following meanings unless the context clearly indicates otherwise.
 - 1. Abatement - Procedures to control fiber release from asbestos-containing materials; which include removal, encapsulation, enclosure, repair, demolition and renovation activities.
 - 2. Airlock - A serial arrangement of rooms whose doors are spaced a minimum of four (4) feet apart so as to permit ingress or egress through one (1) room without interfering with the next and constructed in such a manner as to prevent or restrict the free flow of air in either direction.
 - 3. Air Monitoring - The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the NIOSH Method 7400. For clearance air monitoring, electron microscopy methods may be utilized for lower limits of detection and specific fiber identification.
 - 4. Amended Water - Water to which a surfactant has been added.

5. Asbestos - The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non- asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.
6. Asbestos-Containing Material (ACM) - Material composed of asbestos of any type and in an amount greater than 1% by weight, either alone or mixed with other fibrous or non-fibrous materials.
7. Asbestos-Containing Waste Materials - Any material that is or suspected of being or any material contaminated with an asbestos-containing material, which is to be removed from a work area for disposal.
8. Authorized Personnel - The Owner, the Owner's representative, Asbestos Abatement Contractor personnel, Asbestos Safety Control Monitor personnel, emergency personnel, or a representative of any Federal, State or local regulatory agency or other personnel under contract for or having jurisdiction over the project.
9. Barrier - Any surface that seals off the work area to inhibit the movement of fibers.
10. Breathing Zone - A hemisphere forward of the shoulders with a radius of approximately six to nine inches (6" - 9").
11. Building Owner - The Owner or his authorized representative.
12. Category I Non-friable ACM - Asbestos-containing packing, gaskets, resilient floor covering and asphalt roofing products containing more than one (1) percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy.
13. Category II Non-friable ACM - Any material, excluding Category I non-friable ACM, containing more than 1 percent asbestos as determined using the methods specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
14. Ceiling Concentration - The concentration of an airborne substance that shall not be exceeded.
15. Clean Room - An uncontaminated area or room which is a part of the worker decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment.
16. Contractor - The Asbestos Abatement Contractor licensed by the State of New Jersey, Department of Labor.
17. Critical Barrier - Two layers of nominal six (6) mil polyethylene sheeting that completely seals off the work area to prevent the distribution of fibers to the surrounding area, such as the opening between the top of a wall and the underside of ceiling construction, electrical outlets, non-removable lights, HVAC systems, windows, doorways,

entranceways, ducts, grilles, grates, diffusers, wall clocks, speaker grilles, floor drains, sink drains, etc.

18. Curtained Doorway - A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing three (3) weighted overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of the two outer sheets along one vertical side of the doorway and securing the vertical edge of the middle sheet along the opposite vertical side of the doorway. Other effective designs are permissible.
19. Decontamination Enclosure System - A series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of workers and equipment.
20. Disposal Bag – six (6) mil thick leak-tight plastic bags used for transporting asbestos waste from work and to disposal site. Each is labeled as follows:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST
ASBESTOS, CLASS 9, RQ, NA 2212

The Contractor shall also label all disposal bags and/or containers with the name of the waste generator (Owner) and the location from which the waste was generated; all in accordance with the USEPA NESHAPS regulation - 40 CFR Part 651, Subpart M.

21. Encapsulant - A liquid material which can be applied to asbestos-containing material which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).
22. Encapsulation - The application of an encapsulant to asbestos-containing materials to control the release of asbestos fibers into the air.
23. Filter - A media component used in respirators to remove solid or liquid particles from the inspired air.
24. Flame-Resistant Polyethylene Sheeting - A single polyethylene film in the largest sheet size possible to minimize seams, nominal six (6) mil thick, conforming to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films.
25. Friable Asbestos Material - Material that contains more than 1% asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.
26. HVAC - Heating, Ventilation and Air Conditioning system.

27. HEPA Filter - A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.
28. HEPA Filter Vacuum Collection Equipment (or vacuum cleaner) - High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.
29. Negative Pressure - Air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (work area).
30. Negative Pressure Respirator - A respirator in which the air pressure inside the respirator inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
31. Negative Pressure Air Filtration Device (AFD) - A local exhaust system device, utilizing HEPA filtration capable of maintaining a negative pressure inside the work area and a constant air flow from adjacent areas into the work area and exhausting that air outside the work area.
32. Owner's Representative(s) – USA Environmental Management, Inc., represented on-site by an Industrial Hygiene Technician (IHT) for all non-permitted work and an Asbestos Safety Technician (AST), certified by the New Jersey Department of Community Affairs, for all permitted work. The IHT/AST shall ensure compliance with these Technical Specifications; all applicable local, State and Federal Regulations.
33. Personal Monitoring - Sampling of the asbestos fiber concentrations within the breathing zone of an employee.
34. Prior Experience - Experience required of the contractor on asbestos projects of similar nature and scope to ensure capability of performing the asbestos abatement in a satisfactory manner. Similarities shall be in areas related to material composition, project size, abatement methods required, number of employees and the engineering, work practice and personal protection controls required.
35. Regulated Asbestos-Containing Material (RACM) - (a) Friable asbestos material, (b) Category I Non-friable ACM that has become friable, (c) Category I Non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II Non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.
36. Removal - The stripping of any asbestos-containing materials from surfaces or components of a facility.
37. Renovation - Altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or taken out are excluded.
38. Respirator - A device designed to protect the wearer from the inhalation of harmful

atmospheres.

39. Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running water controllable at the tap and suitably arranged for complete showering during decontamination.
40. Surfactant - A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
41. Time Weighted Average (TWA) - The average concentration of a contaminant in air during a specific time period.
42. Visible Emissions - Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.
43. Water Column (w.c.) - A unit of measurement for pressure differential.
44. Wet Cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops or other cleaning utensils that have been dampened with amended water or diluted removal encapsulant and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.
45. Work Area - Designated rooms, spaces, or areas of the project in which asbestos abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A contained work area is a work area that has been sealed, plasticized and equipped with a negative pressure air-filtration system.
46. Worker decontamination enclosure - A decontamination system consisting of a clean room, a shower room, and an equipment room separated from each other and from the work area by airlocks and curtained doorways. This system is used for all worker entrances and exists to and from the work area and for equipment pass out for small jobs.

1.6 CODES & STANDARDS RELATIVE TO ASBESTOS ABATEMENT

- A. Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes, regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.
- B. The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state and local regulations. The Contractor shall hold the Owner and the Owner's representative harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or subcontractors.

C. State of New Jersey requirements which govern asbestos abatement work or hauling, and disposal of asbestos waste materials include but are not limited to the following:

1. Asbestos Licenses and Permits

New Jersey Department of Labor & Workforce Development
Division of Public Safety & Occupational Safety & Health
Asbestos Control & Licensing Section
1 John Fitch Plaza
P.O. Box 949
Trenton, NJ 08625-0949

2. Asbestos Hazard Abatement Sub-code - N.J.A.C. 5:23-8

New Jersey Department of Community Affairs
Division of Codes and Standards
Asbestos Safety Unit
101 South Broad Street
P.O. Box 816
Trenton, NJ 08625-0816

3. Asbestos Training Courses - N.J.A.C. 8:60 and 12:120

New Jersey Department of Health and Senior Services
Indoor Environments Program
Consumer and Environmental Health Services
P.O. Box 360
Trenton, NJ 08625-0360

4. Disposal Regulations - N.J.A.C. 7:26

New Jersey Department of Environmental Protection
Division of Solid and Hazardous Waste
P.O. Box 414
Trenton, NJ 08625-0414

B. Standards which apply to asbestos abatement work of hauling and disposal of asbestos waste materials include but are not limited to the following:

1. American National Standards Institute (ANSI)
25 West 43rd Street, 4th Floor
New York, NY 10036

- *Fundamentals Governing the Design and Operation of local Exhaust Systems Publication Z9.2-79.*
- *Practices for Respiratory Protection Publication Z88.2-80.*

2. American Society for Testing and Materials (ASTM)
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

- *Safety and Health Requirements Relating to Occupational Exposure to Asbestos E 849-82.*
- *Specification for Encapsulants for Friable Asbestos Containing Building Materials Proposal P-189.*

PART 2 – SCOPE OF WORK

2.1 SUMMARY OF WORK

This section covers the furnishing of all labor, materials, facilities, equipment, services, permits and agreements necessary to perform the work required for asbestos abatement in accordance with these Technical Specifications, United States Environmental Protection Agency (USEPA) and OSHA regulations, NIOSH recommendations, State of New Jersey regulations and other applicable federal, state and local government regulations. Wherever there is a conflict or overlap of the above references the most stringent provisions shall apply. It shall be the Contractor's responsibility to verify exact quantities and locations of all asbestos-containing materials. The quantities shown are for informational purposes only. It is USA Environmental Management, Inc.'s understanding that the Contractor has verified the materials and quantities to be removed under this scope of work and has priced the work accordingly.

2.2 DESCRIPTION OF THE WORK

A. Site:

State Office Building
135 West Hanover Street
Trenton, Mercer County, NJ

B. Contractor shall remove and dispose of approximately:

1. 210 window units (24 linear feet per unit) with asbestos-containing caulk (under metal casing) at wood to brick interface, via non-friable methods, in accordance with 028213, 2.7; and
2. 1,110 square feet black tar coating over exterior window wells, via non-friable methods within a negative pressure enclosure.

C. Removal shall be completed, as specified in the Contract Documents and per all applicable Federal, State and Local regulations.

D. Refer to all Contract Drawings for locations of all asbestos-containing materials to be removed.

2.3 ADDITIONAL INFORMATION

A. The Contract Drawings are designed to compliment the Technical Specifications. Wherever conflicts arise between the Contract Drawings and the Technical Specifications, the more stringent shall apply.

B. Prepare all asbestos-containing materials for transportation and disposal in accordance with NEHAPS, OSHA and the United States Department of Transportation (USDOT) asbestos waste

handling requirements.

- C. The Contractor shall be aware that electrical, communication and other utility lines may exist in proximity to some locations where asbestos-containing material is to be removed. The Contractor shall exercise caution with his/her activities during preparation, removal, clean-up and final cleaning operations associated with asbestos abatement in these work areas, to prevent damaging said electrical, communication and other utility lines. Where possible, the Contractor shall cautiously move and secure the aforementioned items.
1. Should the Contractor damage any electrical, communication and/or other utility lines, the Contractor shall be responsible for either the cost to the Owner to repair/replace damaged components or shall arrange for the components to be repaired/replace to the Owner's specifications with no additional cost to the Owner.
 2. The Owner shall be the **SOLE** deciding factor as to which option referenced above the Contractor shall implement to repair/replace electrical, communication and/or other utility lines that are damaged as a result of the asbestos abatement activities in these work area locations.
 3. Damage caused by the Contractor to surfaces, finishes and building components shall be restored to their existing conditions. The Contractor shall be responsible for either the cost to the Owner to restore damaged surfaces, finishes and building components or shall arrange for the restoration to the Owner's specifications with no additional cost to the Owner.
- D. The Contractor shall utilize proper protective equipment (PPE) such as safety glasses, disposable gloves, protective suits, safety shoes and HEPA cartridge equipped full-face respirators and other appropriate personal protective equipment when handling asbestos contaminated materials during pre-cleaning activities. The Contractor shall utilize proper PPE, including, but not limited to those items noted above, when complying with any Variance (i.e., electrical) submitted by the ASCM and approved by the State of New Jersey, Department of Community Affairs.
- E. Security shall be required as follows:
1. The Owner shall be responsible to provide access to and to close the building each shift. The Contractor shall be responsible to ensure protection against damage or vandalism to separation barriers, engineering systems, monitoring devices, work-related equipment or any other equipment.
- F. The Owner shall provide continuous unlimited access for the IHT/AST in all occupied spaces for installation, maintenance, and data collection from monitoring systems.
- G. The Contractor shall coordinate the location of all waste vehicles with the Owner. The Owner shall approve all locations of waste vehicles prior to the waste vehicle's arrival.
- H. Project Duration:
1. It is the intention of the client to complete the asbestos abatement related work within thirty-five (35), eight (8) hour work shifts; during normal business hours Monday –

Friday, 7:00 AM to 4:30 pm, excluding weekends and holidays.

2. The work schedule shall be maintained by the Contractor at all times. There shall be no provisions allowed for the Contractor to extend or alter the schedule.
3. The abatement related work schedule shall include satisfactory clearance air sampling, final inspection of the work area and demobilization of all contractor equipment.
4. The total duration of the asbestos abatement work shall not exceed thirty-five (35), work shifts. The contractor is required to provide acceptable crew sizes, along with adequate supply of materials and equipment to allow work to proceed uninterrupted and at an appropriate pace to complete all abatement work within this number of work shifts. The contractor will be responsible to pay for the costs of the consultant (through a credit change order) at a cost of \$1,100 per work shift for each work shift that abatement work is performed beyond this duration.

2.4 STANDARD OPERATING PROCEDURES

- A. The Contractor shall develop and implement a written standard operating procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, general public and the environment.
- B. The standard operation procedure shall ensure:
 1. Proper protective clothing and respiratory protection prior to entering the work area.
 2. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking or breaking of respiratory protection in any way.
 3. Packing, labeling, loading, transporting and disposal of asbestos-containing materials in a way that minimizes exposure and contamination.
 4. Proper exit practices from the workspace to the outside through the decontamination facility.
 5. Emergency evacuation for medical or safety to minimize exposure.
 6. Safety from accidents in the work area, especially from electrical shocks, slippery surfaces and entanglements in loose hoses, temporary wiring and other equipment.
 7. Provisions for effective supervision and personnel air monitoring during work.
 8. Engineering systems that minimize exposure to fibers in the work place.
- C. Perform OSHA 8-hour Time Weighted Average personal exposure air monitoring in accordance with 29 CFR 1926.1101. OSHA monitoring is solely the responsibility of the Contractor, and the Contractor shall ensure that the Contractor's Supervisor performs OSHA monitoring in accordance with 29 CFR 1926.1101. The Owner's Representative is not responsible for the

Contractor's compliance with OSHA monitoring.

- D. Provide Personal Protective Equipment (PPE) to the Owner's Representative and inspector's representing Federal, State and local agencies, as required to perform progress inspections of the work.

2.5 NOTIFICATIONS, WARNING SIGNS, LABELS AND POSTERS

- A. At the entrance the work area and/or decontamination unit, the Contractor's ingress/egress point to the building and the exterior door that leads from the exterior of the building for the waste removal route, and all sides of the waste dumpster, post an approximate twenty by fourteen inch (20" x 14") manufactured caution sign displaying the following legend with letter sized and styles of a visibility required by 29 CFR 1926:

**DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS**

**AUTHORIZED
PERSONNEL ONLY**

**WEAR
RESPIRATORY PROTECTION
AND PROTECTIVE CLOTHING
IN THIS AREA**

- B. Disposal/Waste Bags/Containers shall be labeled as follows:

**DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST
ASBESTOS, CLASS 9, RQ, NA 2212**

In addition, the Contractor shall also label all disposal bags and/or containers with the name of the waste generator (Owner) and the location from which the waste was generated; all in accordance with the USEPA NESHAPS regulation - 40 CFR Part 651, Subpart M.

- C. Provide other signs, labels, warnings and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, USEPA and NIOSH.
- D. Post ten (10) day Notifications to the USEPA, New Jersey Department of Community Affairs (when applicable), New Jersey Department of Labor and Workforce Development, New Jersey Department of Environmental Protection and New Jersey Department of Health and Senior

Services, at the entrance to the work area(s).

- E. Post Construction Permits, if applicable, at the entrance to the work area(s).

2.6 DECONTAMINATION UNITS

A. Description of Work:

- 1. Provide personnel decontamination for each work area. In this case the decontamination unit can be located on-site, remote from the actual work area, but accessible to workers.

B. Personnel Decontamination Unit:

- 1. Provide a personnel decontamination unit consisting of a serial arrangement of connected rooms or spaces, clean room, shower room and equipment room. Do not allow parallel routes for entry or exit. Provide temporary lighting within decontamination units as necessary to reach a lighting level of 100 foot candles.
- 2. Clean room: Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing.
 - a. Construct using two (2) individual layers of polyethylene sheeting, at least six (6) mil in thickness on all sides.
 - b. Locate so that access to the work area from the changing room is through shower room.
 - c. Separate changing room from the building by a three (3) sheet plastic, weighted, flapped doorway.
 - d. Require workers to remove all street clothes in this room, dress in clean disposable coveralls, and respiratory protective equipment. Do not allow asbestos contaminated items to enter this room. Require workers to enter this room either from outside the structure dressed in street clothes, or naked from the showers.
 - e. Maintain floor of clean room dry and clean at all times. Do not allow overflow water from shower to wet floor in clean room.
 - f. Damp wipe all surfaces twice after each shift change with a disinfectant solution.
 - g. Provide posted information for all emergency phone numbers and procedures.
- 3. Shower Room: Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the equipment room/work area from the clean room, or for showering by workers headed out of the work area after undressing in the equipment room.
 - a. Construct room by providing a shower pan and shower walls in a configuration that will cause water running down walls to drip into pan.
 - b. Provide a three (3) tier plastic flapped doorway at the entrance to the shower chamber.
 - c. Provide shower head and controls.
 - d. Provide temporary extensions of existing hot and cold water and drainage, as necessary for a complete and operational shower.
 - e. Provide a soap dish and a continuously adequate supply of soap and maintain in sanitary condition.
 - f. Arrange so that water from showering does not splash into the clean or equipment rooms.

- g. Separate from equipment room by a three (3) sheet plastic, weighted, flapped doorway.
4. Equipment Room (contaminated area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers.
 - a. Separate this room from the work area by a three (3) sheet plastic, weighted, flapped doorway.
 5. Decontamination Sequence: The Contractor shall require that all workers adhere to the following sequence when entering or leaving the work areas.
 - a. Entering Work Area: Worker enters clean room and removes street clothing, puts on clean disposable coveralls and respirator, and passes through the shower room into the equipment room. Any additional clothing and equipment left in equipment room needed by the worker are put on in the equipment room. Worker proceeds to the work area.
 - b. Exiting Work Area: Before leaving the work area, require the worker to remove all gross contamination and debris from coveralls and feet.
 - c. The worker then proceeds to the equipment room and removes all clothing except respiratory protection equipment.
 - d. Extra work clothing such as boots, hard hats, goggles, gloves, etc., are to be stored in the equipment room.
 - e. Disposable coveralls are placed in a bag for disposal with other material.
 - f. Require that decontamination procedures be followed by all individuals leaving the work area.
 - g. After showering, the worker moves to the clean room and dresses in either new coveralls for another entry or street clothes if leaving.
- C. Construction of the Decontamination Units:
1. Walls and Ceiling: Construct airtight walls and ceiling using two (2) layers of polyethylene sheeting, at least six (6) mil in thickness. Attach to existing building elements or a temporary framework.
 2. Floors: Use two (2) layers of six (6) mil polyethylene sheeting to cover floors in all areas of the decontamination units.
 3. Flap Doors: Fabricate from three (3) overlapping sheets with openings a minimum of four (4) feet wide. Configure so that sheeting overlaps adjacent surfaces. Weigh sheets at bottoms as required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of four (4) feet between entrance and exit of any room.
- D. Cleaning of Decontamination Units:
1. Clean debris and residue from inside of decontamination units on a daily basis or as otherwise indicated. Damp wipe twice or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.
- E. Signs:

1. Post an approximately 20" x 14" manufactured caution sign at each entrance to the work areas displaying the following legend with letter sizes and styles of a visibility required by 29 CFR, Part 1926:

Provide signs in both English and Spanish.

LEGEND:

**DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS**

**AUTHORIZED
PERSONNEL ONLY**

**WEAR
RESPIRATORY PROTECTION
AND PROTECTIVE CLOTHING
IN THIS AREA**

Provide spacing between respective lines at least equal to the height of the respective upper line.

2.7 REMOVAL OF INTACT ASBESTOS-CONTAINING MATERIALS

A. DESCRIPTION OF WORK

1. Work specified herein is limited to those materials that can be removed intact and in whole sections such as, but not limited to:
 - a. White Exterior Window Caulk (Under Metal Casting) at Wood to Brick Interface.

B. PRODUCTS

1. Six (6) mil polyethylene sheeting
2. Spray glue
3. High quality duct tape
4. Garden sprayer
5. Amended water
6. Asbestos warning signs
7. Other equipment deemed necessary by the Contractor, such as man-lifts, fork lifts, etc.

C. EXECUTION OF WORK

(A) General:

1. The Contractor shall provide all ladders, scaffolding and/or other necessary equipment for the installation of all engineering controls and removal of materials.
2. Removal activity shall not commence until a written Notice to Proceed has been issued by USAEMI's on-site representative. Approval of each work area for removal activity shall not, in any way, relieve the Contractor of his responsibility to ensure that non-work areas and items/equipment within each work area are protected from smoke/fumes, physical damage, or asbestos contamination from this project.
3. Post appropriate warning signs and/or tape at the entrance to the work area and around the work area boundaries.
4. Mist the material with amended water.
5. Remove fasteners used to secure the non-friable asbestos containing material (ACM) to the substrate without disturbing the ACM.
6. Remove the non-friable ACM in whole sections and place on two (2) layers of six (6) mil polyethylene sheeting.
7. Package the ACM with the two (2) layers of polyethylene sheeting and seal all seams with spray-glue and duct tape.
8. Place appropriate warning signs and generator labels on the packaged ACM and place in the on-site waste container or Asbestos Abatement Contractor's registered vehicle, in accordance with the requirements set forth in this Technical Specification.
9. Personnel shall decontaminate in accordance with the requirements set forth in this Technical Specification.
10. Engineering controls shall remain operational until a satisfactory visual inspection, final clearance air samples have been collected and the clearance criteria achieved, as conveyed by the IHT.

(B) Interior Work Area(s) Preparatory Activities:

1. The Contractor shall install a two (2) flapped fire retardant, six (6) mil polyethylene sheeted air lock at the entrance to the work areas. Entrance flaps are to be installed so that the flaps will close if air flow into each work area is stopped for any reason.
2. The Contractor shall be responsible for the erection of critical barriers consisting of two (2) layers of fire retardant, six (6) mil polyethylene sheeting over all openings and access points from the exterior of the work area(s) and over all electrical panels within the work areas. The Contractor shall provide all ladders, scaffolding and/or other necessary equipment for the installation of all engineering controls.

3. The Contractor shall provide and install HEPA-equipped air filtration device(s) (AFDs) within the work areas to create a continuous negative pressure within the work areas throughout abatement operations, in addition to the prevention of smoke/fumes from exiting the work areas. This may require more than one (1) AFD depending on conditions. Exhaust for the AFDs shall be ducted to the outside of the building.
 - a. Sufficient number of AFDs shall be utilized to ensure air changes every 15 minutes.
 - b. If necessary, the Contractor shall construct all exterior exhaust manifolds using a minimum of ½" inch fire rated plywood sheeting with sheet metal flanges. The Contractor shall affix duct outlet with mechanical fasteners. The Contractor shall also be responsible for establishing streamers at the outlets of the duct work to provide quick assessment of the AFDs operation.

(C) Exterior Work Area(s) Preparatory Activities:

1. For exterior removal, install one (1) layer of six (6) mil polyethylene sheeting, extending ten (10) feet out from the building, and extending twelve inches (12") up the building wall where work is being performed. Contractor shall overlap all seams by a minimum of twelve inches (12").
2. For exterior removal, install asbestos warning/caution tape a minimum of twenty feet (20') out in all directions where work is being performed.
3. For exterior removal, install critical barriers consisting of two (2) layers of fire retardant, six (6) mil polyethylene sheeting over all windows from the interior side of the work areas.

2.8 WORK AREA CLEAN UP

- A. All surfaces and Contractor equipment in the work area(s) shall be cleaned after completion of the removal activities.
- B. Walls and adjoining adjacent surfaces shall be wet cleaned.
- C. The polyethylene sheeting installed shall be rolled up keeping the top surface to the inside and placed into six (6) mil asbestos disposal bags for disposal as asbestos contaminated waste.
- D. Upon issuance of a satisfactory visual inspection, the Owner's representative shall proceed with the collection of final clearance air samples, if applicable.

2.9 ASBESTOS WASTE HANDLING AND DISPOSAL

- A. Disposal bags shall be six (6) mil, leak tight, and labeled in accordance with OSHA, NESHAPS, and the United States Department of Transportation (USDOT) regulations.
- B. Load all asbestos-containing waste material in disposal bags or leak-tight drums. All materials are to be contained in one (1) of the following:

1. Two (2), six (6) mil disposal bags, or,
 2. Two (2), six (6) mil disposal bags and a fiberboard drum, or
 3. Two (2), six (6) mil disposal bags, and sealed steel drum.
- C. Two (2) layers of six (6) mil flame resistant polyethylene sheeting shall be utilized for wrapping large components not suited for disposal bags or drums.
- D. Duct tape shall be used to seal disposal bags and wrapped components.
- E. The Contractor's vehicle and/or dumpster shall be lined with a critical barrier of two (2) layers of six (6) mil flame resistant polyethylene sheeting. The Contractor's vehicle and/or dumpster utilized to transport the asbestos waste off-site, and the Waste Hauler shall be licensed by the New Jersey Department of Environmental Protection.
- F. Contractor shall remove waste from work area to waste dumpster only during times of minimum occupancy (i.e., at the end of the work shift when building occupancy is anticipated to be at its minimum).
- G. Maintain records of waste shipments in accordance with NESHAPS 40 CFR Part 61, section 61.150, (d) 1-5 and (e).
- H. Notify the USEPA ID #27 approved landfill within ten (10) days prior to transportation of the asbestos-containing waste to the landfill. Provide the name and address of the landfill. Retain manifest from the landfill for all materials disposed. At the completion of asbestos abatement forward all manifests to the Owner.
- I. On-site activities shall not be considered complete until all waste is off-site, upon demobilization of the work area(s), after receipt of satisfactory final clearance air sample results.

PART 3 – AIR MONITORING

3.1 DESCRIPTION OF THE WORK

- A. This Section describes air monitoring to verify that the building beyond the work area and the outside environment remains uncontaminated. This Section also sets forth airborne fiber levels both inside and outside the work area as action levels, and describes the action required by the Contractor if an action level is met or exceeded.
- B. AIR MONITORING REQUIRED BY OSHA IS RESPONSIBILITY OF THE CONTRACTOR AND IS NOT COVERED IN THIS SECTION.

3.2 BACKGROUND AIR MONITORING

- A. The Owner's Representative will conduct background environmental/daily air monitoring to

detect faults in the abatement removal methods.

- B. Daily Air Monitoring (including the building interior adjacent to the work) shall be performed from the start of work to project decontamination, per shift. The Owner's Representative will collect air samples from locations adjacent to the work area, including critical barriers, the clean room of the decontamination unit and the waste removal route (as applicable).
- C. Phase Contrast Microscopy (PCM) sampling and analysis will be performed using the latest revision of NIOSH Method 7400.
- D. If any air sample exceeds the action level of 0.010 fibers per cubic centimeter, immediately and automatically stop all work except corrective action.

PART 4 – PROJECT COMPLETION

4.1 FINAL INSPECTION

- A. The Owner's Representative will perform a final visual inspection of the abatement work area(s) to document the project has been completed in accordance with these Technical Specifications and all applicable Local, State and Federal regulations.

END OF SECTION 028213

LIMITED HAZARDOUS MATERIALS REPORT
For
RESTORATION UPGRADES TO EXTERIOR BUILDING ENVELOPE
AT
STATE OFFICE BUILDING
135 WEST HANOVER STREET
TRENTON, MERCER COUNTY, NJ

DPMC PROJECT NO. M1310-00

Prepared for:

Lammy & Giorgio, P.A.
215 Highland Avenue, Suite B
Haddon Township, New Jersey 08108

Prepared by:

USA Environmental Management, Inc.
344 West State Street
Trenton, New Jersey 08618

USAEMI Project No.: 19-020046-03

Report Date: July 15, 2019



USA Environmental Management, Inc.
Environmental Engineering Construction

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1.0 INTRODUCTION

USA Environmental Management, Inc., (USAEMI) was contracted by Lammey & Giorgio, P.A. to conduct a limited hazardous materials assessment of the State Office Building located at 135 West Hanover Street in Trenton, Mercer County, New Jersey. The purpose of the inspection was to determine the presence or absence of asbestos, lead-containing paint and polychlorinated biphenyl (PCB) which may be impacted during the Restoration Upgrades to Exterior Building Envelope Project (State of New Jersey, Department of the Treasury, Division of Property Management & Construction Project No. M1310-00). The assessment was limited to the exterior of the building (including the roof) as well as any associated interior components which may be impacted by the improvements.

The limited hazardous materials assessment was conducted by William Weisgarber, Jr. and Richard Reynolds on Friday, June 28, 2019. Both inspectors are certified United States Environmental Protection Agency (EPA), Asbestos Hazard Emergency Response Act (AHERA) Asbestos Building Inspectors. In addition, Mr. Weisgarber and Mr. Reynolds are certified State of New Jersey, Department of Health, Lead Inspectors/Risk Assessors. The inspectors have significant experience in asbestos-containing material (ACM) surveys, lead-containing paint (LCP) assessments and hazardous materials assessments. In addition, Lammey & Giorgio, P.A., sub-contracted H.J. Cannon Group, Inc., to complete roof coring and subsequent patching.

Copies of all applicable Certifications and Licensure are attached to this report.

2.0 SURVEY FOR ASBESTOS-CONTAINING MATERIALS

2.1 Asbestos History

During the last few decades the medical evidence has continued to mount regarding the importance of environmental factors as a source of carcinogenicity. Asbestos is regulated by the Occupational Safety and Health Administration, cited by the National Institute for Occupational Safety and Health, the International Agency for Research on Cancer, the National Toxicology Program, and the Carcinogens Assessment Group of the EPA.

As a result of the pervasive use of this material, asbestos has become a widespread environmental contaminant for large segments of our society and has been conclusively demonstrated to cause fibrosis and malignancies of the lung and other organs. The majority of the evidence comes from industrial exposure to this material, whereas exposures were more intense and for a greater period of time. However, there is also evidence that low exposures to asbestos fibers may also have carcinogenic potential.

Asbestos fibers resist degradation and persist in the environment because of the fibers particular structure. They possess aerodynamic capabilities for prolonged suspension and repeated cycles of re-entrainment. Asbestos fibers find entry into the body by inhalation and through ingestion. The retained fibers are found in tissues throughout the lifetime of the exposed person - long after

cessation of exposure. It has been demonstrated that asbestos fibers can migrate to other organs. Malignancies related to inhalation and ingestion include cancer of the lungs, mesothelioma of the pleura and peritoneum (lining of the lung and abdominal region), and neoplasms of other sites.

The degree and duration of exposure to develop an asbestos related health disorder is unknown at this time. However, a report to the U.S. Consumer Products Safety Commission by the Chronic Hazard Advisory Panel on Asbestos reports:

From a public health standpoint, and in the absence of final clarifications of the uncertainties, it is prudent to behave as if asbestos fibers may be carcinogenic at low level exposure and at small particle sizes.

As a result, the Asbestos Hazard Emergency Response Act (40 CFR Part 763) was enacted. An AHERA inspection requires an accredited inspector to visually inspect and assess the condition of all known or assumed friable asbestos-containing materials; to visually inspect non-friable ACM and touch it to determine friability; and to identify homogeneous areas of friable materials. The National Emission Standard for Hazardous Air Pollutants (NESHAPs) requires thorough inspections for ACM in structures before renovation or demolition.

NESHAP's ACM CATEGORIES		
Categories	Typical Material Type	Guidance for RACM
Friable ACM	Pipe insulation and pipe-fittings	Able to crush with hand pressure
Category I, Non-friable	Floor covering products, Gaskets, Roofing cements	Non-friable made friable due to sanding, grinding, cutting or abrading
Category II, Non-friable	Cement board products, floor tile, etc., that is significantly damaged.	Non-friable material becoming friable or is expected to become friable from the act of renovation or demolition

Any ACM that is Friable, or Category I and II Non-friable that meets the qualifications to be considered a Regulated Asbestos-Containing Material (RACM), must be removed prior to demolition that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal. This includes gasket materials.

2.2 Asbestos Inspection

This inspection for ACM was limited in scope to include interior and exterior materials which may be impacted during the Restoration Upgrades to Exterior Building Envelope Project. Wherever possible, the attempt was made to determine the presence of hidden materials. USAEMI collected the necessary number of bulk samples to properly identify ACM. All samples collected were in accordance with 40 CFR, Part 763, the EPA's, AHERA protocol. Sampling was performed utilizing wet methods. Equipment used during the survey was decontaminated at the completion

of extracting each sample, eliminating the potential for any cross contamination of samples. In addition, all samples were given a homogeneous area sampling identification number.

Samples of each homogenous material were delivered to International Asbestos Testing Laboratories (IATL) located at 9000 Commerce Parkway, Suite B, Mt. Laurel, New Jersey. IATL is an independent laboratory accredited by the National Voluntary Laboratory Accreditation Program (NVLAP Lab Code: 101165-0). Sample analysis was performed via Polarized Light Microscopy (PLM) in accordance with 40 CFR, Part 763.87(a) and/or Transmission Electron Microscopy (TEM), in accordance with N.J.A.C. 12:120, Appendix. The laboratory's Certificates of Analysis and the corresponding Chain of Custody records are found in Appendix A of this report. Certificates of Analysis include the type and percentage of asbestos, if found in the sampled material, and the method of analysis.

The sample identification system of this report consists of a three-unit sample identification number. The first set of text indicates the sample number, the next set indicates the inspector's initials and the last six (6) digits indicate the sampling date. These sample numbers match the chain-of-custody and lab reports of analysis.

Sample result summaries are provided in table format. The first column indicates the homogenous area identification number (ID No.); the second column is the material description; and the third column indicates the asbestos content, type of asbestos or if the material was none detected for asbestos. Sampled materials that contain asbestos and/or were assumed to contain asbestos are indicated in *italic bold*.

2.3 Asbestos Summary

During the course of the assessment, USAEMI noted a total of thirty-four (34) suspect materials from the State Office Building. The suspect, identified materials were sampled in sufficient quantity as mandated by 40 CFR, Part 763.87(a). Of the materials analyzed, **four (4)** tested positive for asbestos [greater than one percent (>1%) asbestos by weight]. Materials sampled for asbestos content are listed below:

TABLE 1 – SUSPECT ASBESTOS MATERIALS		
ID No.	Material Description	Asbestos
01	White Textured Finish Coat Plaster	None Detected
02	Grey Rough Coat Plaster	None Detected
03	Gypsum Paper Drywall & Associated Joint Compound	None Detected
04	Brown Interior Window Caulk at Metal Casing to Wall Interface	None Detected
05	White Interior Window Caulk at Wood Casing/Trim to Wall Interface	None Detected
06	Roof Field with Stone Ballast (Type 1 - Main Roof)	<0.25% Chrysotile
07	Felt on Iso-Board Under ID No. 06 (Type 1 - Main Roof)	None Detected
08	Tar/Asphalt on Concrete Roof Deck Under ID No. 06/07 (Type 1 - Main Roof)	None Detected
09	Grey Mineral Coat Flashing at Parapet & Curbs (Type 1 - Main Roof)	<0.25% Chrysotile
10	Tar/Asphalt on Parapet & Curbs Under ID No. 09 (Type 1 - Main Roof)	4.2% Chrysotile

TABLE 1 – SUSPECT ASBESTOS MATERIALS

ID No.	Material Description	Asbestos
11	Tar Coating at Coping Seams	None Detected
12	Tar/Asphalt at Pitch Pockets	None Detected
13	White Exterior Louver Caulk	None Detected
14	White Exterior Window Glazing – Penthouse	0.6% Chrysotile
15	<i>Tar at Seams of Copper Penthouse Walls</i>	<i>1.8% Chrysotile</i>
16	Clear Glazing Associated with Door Windows	None Detected
17	White Sealant at Exterior Electrical Conduit Penetrations	None Detected
18	Roof Field with Stone Ballast (Type 2 - Penthouse Roof)	<0.25% Chrysotile
19	Tar/Asphalt on Concrete Roof Deck Under ID No. 18 (Type 2 - Penthouse)	0.25% Chrysotile
20	Grey Mineral Coat Flashing Parapet (Type 2 - Penthouse)	0.3% Chrysotile
21	Tar/Asphalt on Parapet Under ID No. 20 (Type 2 - Penthouse)	0.5% Chrysotile
22	Tar/Asphalt at Seams of Flashings ID No. 09 & 20	None Detected
23	Grey Exterior Window Caulk Associated with Penthouse Window(s)	None Detected
24	Grey Tar Coating at Chimney Stack	None Detected
25	Brown Exterior Door Caulk	None Detected
26	Light Grey Exterior Window Caulk	None Detected
27	Grey Exterior Window Glazing	None Detected
28	Grey Exterior Door Caulk	None Detected
29	<i>Black Tar Coating Over Exterior Window Well</i>	<i>7.5% Chrysotile</i>
30	Caulk at Exterior Window Well Grate Cover	None Detected
31	Brown Exterior Window Caulk at Metal Casing to Brick	None Detected
32	<i>White Exterior Window Caulk (Under Metal) at Wood Trim and Brick</i>	<i>1.7% Chrysotile</i>
33	White Exterior Door Caulk Remnants	None Detected
34	White Sealant at Seams/Cracks of Concrete Exterior Stairs	None Detected

2.4 Asbestos Assessment Disclaimer

The Client should be aware that this survey incorporated limited destructive sampling to access hidden or obscured asbestos-containing materials (ACM). However, non-observable asbestos-containing materials may exist in such areas as vapor barrier below grade, tar coatings behind brick façade, metal insulated panels, piping lines in wall cavities, ACM on pipes buried in concrete slabs and other potential ACM which is inaccessible for sample extraction due to the physical coverage of the material. Due diligence was observed in performing sampling by generally recognized industry sampling practices.

2.5 Asbestos Recommendations

The following general recommendations are provided to assist in the renovation and localized renovation of the existing structures with ACM. Note that any building material that is not identified as homogenous with those addressed in this report must be considered as ACM unless additional testing indicates otherwise.

The following work practices should be followed whenever activities involving any ACM occur at this Facility.

- Ensure any ACM is managed in accordance with Federal, State and Local regulations.
- Remove any ACM that maybe disturbed during renovations or ensure the materials will not be disturbed.
- Always keep any ACM adequately wet before, during, and after removal operations.
- Conduct activities in a manner which produces no visible emissions to the outside air.
- Handle and dispose of all ACM in accordance with Federal, State and Local regulations.
- Maintain this report as a component of the historical record for the buildings.

2.6 Asbestos Certification

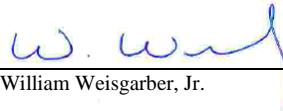
The American Industrial Hygiene Association (AIHA) and National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory selected to analyze the bulk samples for asbestos content by PLM and TEM method, equivalent to the "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" (Appendix A to Subpart F in 40 CFR Part 763) was:

INTERNATIONAL ASBESTOS TESTING LABORATORIES (IATL)
9000 COMMERCE PARKWAY
MT. LAUREL, NEW JERSEY 08054


The inspectors who physically surveyed for ACM at the facility and have received EPA-approved training as asbestos inspectors are:

WILLIAM WEISGARBER, JR. & RICHARD REYNOLDS
USA ENVIRONMENTAL MANAGEMENT, INC.
344 WEST STATE STREET
TRENTON, NEW JERSEY 08618

SIGNATURE OF INSPECTOR(S):



William Weisgarber, Jr.



Richard J. Reynolds

The above-signed inspector(s) certify information contained within this asbestos inspection report is true and correct concerning site conditions at the time of survey only.

3.0 SURVEY FOR LEAD-CONTAINING PAINT

3.1 Lead Paint History

Since 1971, the construction industry has been required to protect workers from exposure to lead through engineering and work practice controls. The current U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA) regulations under 29 CFR 1926.62 set the following limits for lead exposure including a lead permissible exposure limit (PEL) of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), and an action level of $30 \mu\text{g}/\text{m}^3$, as determined using an 8-hour time weighted average. Since lead paint has been determined to be a health threat, an assessment of buildings for the presence of lead paint is recommended in order to prevent occupational exposure to personnel or the general public, and to enact appropriate control measures for lead hazards.

OSHA and EPA regulations must be followed when renovation or demolition work affects any lead-based paint or paints with detectable lead levels referred to as lead-containing paint (LCP). X-Ray Fluorescence (XRF) testing of components was used as the primary testing method for the site.

A preconstruction inspection is not to be confused with a U.S. Department of Housing and Urban Development (HUD) Title X lead inspection. The preconstruction inspection's primary purpose is to identify major building components containing lead or other lead hazards in order to properly address the lead during renovation/demolition that may be impacted by the proposed work for the purpose of OSHA compliance. The inspection was conducted using the EPA's work practice standards for conducting lead-based paint activities (40 CFR 745.27) as a guide.

As per OSHA, disturbance of paint containing lead requires special training and initial exposure monitoring at a minimum. OSHA standard 29 CFR 1926.62 (Lead in Construction Standard) is invoked if any lead is present in paint or other coatings, since there is no minimum concentration level, as opposed to the EPA and HUD definitions of lead-based paint in child occupied facilities and public/private housing. These standards set forth the regulations that apply with regards to construction or renovation of painted materials or structures that contain detectable amounts of lead and not necessarily lead pigment containing items that have been manufactured.

An X-ray tube source XRF instrument was used for this inspection. The unit was operated by a factory trained user in the standard lead paint test mode using the rules and procedures found in the Performance Characteristic Sheet (PCS) for the instrument. The XRF is not substrate dependent according to the PCS, so no substrate corrections were required.

The XRF is calibrated at the beginning of the testing, every four hours thereafter and/or at the end of the testing, whichever came first. Calibrations are noted on the XRF data sheets included in appendices. Quality control included calibrations to the NIST standard for XRF sampling and duplicate testing of the same component.

3.2 LBP Sampling

XRF sampling does not require collection of material and is considered non-destructive. This state-of-the-art method for determining the composition of painted surfaces can quickly determine if a surface contains lead-based/containing paint or not, and provides sufficient data concerning the amount of lead contained in paint. Data is provided as recorded by the XRF unit at the time of the survey using pre and post calibration, and by following the performance characteristic sheet of the equipment. Areas are immediately identified as coated with lead-based/containing paint using this method.

Most components tested are believed to contain several layers of paint film and are difficult to interpret. XRF and bulk paint analysis does not differentiate which layer of paint may contain lead. The results only indicate the amount of lead that is present in the sample/test location. Lead is likely to be present at a higher percentage in a particular layer than reported due to averaging the weight of other layers of paint into the calculation. For this reason, OSHA standards apply to any sample with detectable lead. Construction activities that impact these paints may result in exposure to lead, even though they are not technically considered lead-based paints.

Results of the lead testing conducted are presented in the following sections.

3.3 XRF Result Ranges

An inspection was performed on painted and non-painted components to be suspect for the presence of lead found. Readings were then taken from a representative number of surfaces, dependent on the quantity of the particular material present. Although OSHA utilizes the term “any detectable lead”, EPA/HUD stipulates that a quantity equal to or above 1.00 mg/cm² is over the regulatory threshold. Information is presented in a lead range format to assist in determining protective measures and special procedures that may be required during renovation/demolition activities.

Using the aforementioned methods, USAEMI determined the following components had detectable levels of lead-containing paint (0.01 mg/cm² or greater):

TABLE 2 – LEAD-CONTAINING COMPONENTS								
Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
7	112	B	Plaster	Wall	Intact	9.9	Positive	Positive
19	100	B	Plaster	Wall	Intact	19.9	Positive	Positive
20	102	B	Wood	Window Casing (7)	Intact	0.11	Negative	Positive
21	102	B	Wood	Window Trim	Intact	0.14	Negative	Positive
22	Penthouse Exterior	D	Metal	Louver	Poor	0.60	Negative	Positive
23	Penthouse Exterior	C	Wood	Louver	Poor	2.6	Positive	Positive
24	Penthouse Exterior	D	Metal	Window Sash	Poor	8.5	Positive	Positive

TABLE 2 – LEAD-CONTAINING COMPONENTS

Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
25	Penthouse Exterior	A	Metal	Electrical Box	Intact	0.06	Negative	Positive
30	Penthouse Exterior	B	Metal	Window Sash	Poor	7.3	Positive	Positive
32	Penthouse Exterior	B	Wood	Panel Above A/C Unit	Intact	0.10	Negative	Positive
33	Penthouse Exterior	B	Metal	Door	Intact	7.0	Positive	Positive
34	R1	N/A	Metal	Vent	Intact	28.5	Positive	Positive
36	501	N/A	Metal	I-Beam	Intact	0.11	Negative	Positive
37	501	B	Metal	Radiator	Poor	4.6	Positive	Positive
38	501	N/A	Concrete	Floor	Intact	1.6	Positive	Positive
39	501	B	Metal	Door Buck	Poor	10.1	Positive	Positive
40	501	N/A	Concrete	Ceiling	Intact	0.30	Negative	Positive
41	501	C	Wood	Louver Frame	Poor	12.4	Positive	Positive
42	501	D	Wood	Louver Frame	Poor	8.0	Positive	Positive
45	S1	A	Plaster	Wall	Intact	0.30	Negative	Positive
46	S1	C	Plaster	Wall	Intact	0.26	Negative	Positive
52	502	D	Wood	Window Frame (1)	Intact	5.3	Positive	Positive
53	417	B	Brick	Window Sill (2)	Intact	0.02	Negative	Positive
54	417	B	Plaster	Wall	Intact	13.1	Positive	Positive
59	405	D	Plaster	Wall	Intact	8.5	Positive	Positive
68	331	D	Plaster	Wall	Intact	13.2	Positive	Positive
77	212	B	Plaster	Wall	Intact	13.2	Positive	Positive
81	231	D	Plaster	Wall	Intact	11.2	Positive	Positive
82	B08	C	Drywall	Wall	Intact	2.7	Positive	Positive
86	B03	B	Plaster	Wall	Intact	13.2	Positive	Positive
88	B05	B	Plaster	Wall	Intact	8.9	Positive	Positive
91	Exterior 1st Floor	A	Wood	Door	Intact	0.11	Negative	Positive
92	Exterior 1st Floor	A	Wood	Door Casing	Intact	0.08	Negative	Positive
95	Exterior Basement	A	Metal	Bars at Windows	Intact	7.6	Positive	Positive
96	Exterior 1st Floor	A	Wood	Small Window (2)	Intact	22.6	Positive	Positive
97	Exterior 1st Floor	A	Wood	Small Window Trim (2)	Intact	24.2	Positive	Positive
100	Exterior Basement	B	Metal	Bars at Windows	Intact	6.6	Positive	Positive
103	Exterior Stair	B	Metal	Hand Rail	Intact	0.21	Negative	Positive
104	Exterior Stair	B	Metal	Stair Tread	Intact	0.02	Negative	Positive
109	Exterior 1st Floor	C	Metal	Lamp Mounting Bracket (1)	Intact	2.4	Positive	Positive
110	Exterior 1st Floor	C	Metal	Lamp (1)	Intact	0.60	Negative	Positive

TABLE 2 – LEAD-CONTAINING COMPONENTS								
Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
111	Exterior 1st Floor	C	Metal	Lamp Mounting Bracket (2)	Intact	2.4	Positive	Positive
112	Exterior 1st Floor	C	Metal	Lamp (2)	Intact	0.80	Negative	Positive
117	Exterior 1st Floor	D	Metal	Guard Rail	Intact	0.17	Negative	Positive
125	Exterior Basement	D	Brick	Window Sill (9)	Intact	0.03	Negative	Positive
126	Exterior Basement	D	Concrete	Window Sill (9)	Intact	0.13	Negative	Positive
128	Exterior Basement	D	Metal	Stringer	Intact	0.09	Negative	Positive
129	Exterior Basement	D	Metal	Stair Tread	Intact	0.12	Negative	Positive
132	Exterior Basement	D	Metal	Window Grate (10)	Intact	6.90	Positive	Positive
134	Exterior 1st Floor	D	Metal	Overhang I-Beam	Intact	0.05	Negative	Positive

XRF field survey documentation can be found in the attached appendices of this report inclusive of the Performance Characteristic Sheet of the XRF Unit.

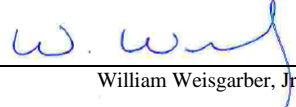

3.4 Lead Recommendations

As per OSHA, disturbance of paint containing lead requires special training and initial exposure monitoring at a minimum. OSHA standard 29 CFR 1926.62 (Lead in Construction Standard) is applicable if any lead is present in paint or other coatings, since there is no minimum concentration level. Refer to Appendix B for any components that may initiate the OSHA Lead in Construction Standard.

3.5 Lead Certification

The New Jersey / USEPA-approved and trained lead inspector(s)/risk assessor(s) who surveyed the project site are:

WILLIAM WEISGARBER, JR. & RICHARD REYNOLDS
 USA ENVIRONMENTAL MANAGEMENT, INC.
 344 WEST STATE STREET
 TRENTON, NEW JERSEY 08618

SIGNATURE OF INSPECTOR(S): 
 William Weisgarber, Jr.

 Richard J. Reynolds

The above-signed inspector(s) certify information contained within this inspection report is true and correct concerning site conditions at the time of survey only.

4.0 SURVEY FOR POLYCHLORINATED BIPHENYLS (PCBs)

4.1 PCB History

PCBs are synthetic organic chemicals that were produced in the United States from 1929 to 1977. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics and rubber products; in pigments, dyes and carbonless copy paper and many other applications. A major use of PCBs was in fluorescent light fixture ballasts (in the capacitor).

PCBs have been demonstrated to cause a variety of adverse health effects including a number of serious non-cancer tumors in animals. These affect the immune system, reproductive system, nervous system, and endocrine system. Studies in humans provide evidence for carcinogenic and non-carcinogenic effects of PCBs. Concern over PCBs in the environment led Congress in 1976 to enact §6(e) of the Toxic Substance Control Act (TSCA) that included among other things, prohibitions on the manufacture, processing, and distribution in commerce of PCBs.

4.2 PCB Testing Parameters

Suspect PCB containing caulks/sealants were identified which may be potentially impacted during the project. USAEMI collected samples of the suspect PCB containing materials. Approximately four (4) grams of material was extracted for each sample and submitted for analysis. Analytical services were provided by EMSL Analytical, Inc., 200 Route 130 North, Cinnaminson, New Jersey. EMSL Analytical, Inc., is accredited by the State of New Jersey, Department of Environmental Protection (Certification 03036) for PCB analysis.

The EPA defines PCB as those materials which are greater than, or equal to, 50 milligrams per kilogram (mg/Kg), which is equivalent to 50 parts per million (ppm). Many of the products in the United States were manufactured by the Monsanto Corporation and marked under the name Aroclor. There are different types of Aroclor, based on the concentrations of chlorine. Four (4) digit numbers followed the name Aroclor, where the last two (2) numbers indicated the percent of chlorine content by weight.

4.3 PCB Results

No suspect PCB caulks/sealants which may be potentially impacted during the project were noted at the State Office Building. Table 3 contains a summary of testing results for the sealants associated with the Restoration Upgrades to Exterior Building Envelope Project, **one (1)** of which was found greater than 50 mg/Kg. This table includes the sample number, sampling room/location,

brief description of the material tested and the Aroclor results. Certificates of analysis and chain of custody records for all PCB samples can be found in Appendix D of this report.

TABLE 3 – POLYCHLORINATED BIPHENYLS			
Sample No.	Location	Material (ID)	Aroclor Detected
01 PCB 062819	Metal Casing to Wall Seams	Brown Interior Window Caulk at Metal Casing to Wall Interface (04)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND
	Wood Trim to Wall Seams	White Interior Window Caulk at Wood Casing/Trim to Wall Interface (05)	Aroclor 1248 – ND Aroclor 1254 – 21 mg/Kg Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND
02 PCB 062819	Penthouse - Wood Louver Seams	White Exterior Louver Caulk (13)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – 0.99 mg/Kg Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND
03 PCB 062819	Penthouse - Exterior Electrical Conduit Penetrations	White Sealant at Exterior Electrical Conduit Penetrations (17)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – ND Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND
04 PCB 062819	Penthouse - Exterior Window Frame to Metal Wall Interface	Grey Exterior Window Caulk Associated with Penthouse Window (23)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – 2.0 mg/Kg Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND
05 PCB 062819	Metal Door Seams	Brown Exterior Door Caulk (25)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND
	Basement - Door Remnants	White Exterior Door Caulk Remnants (33)	Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – ND Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND

TABLE 3 – POLYCHLORINATED BIPHENYLS

Sample No.	Location	Material (ID)	Aroclor Detected
06 PCB 062819	1 st Floor - Small 1'x4' Windows at Front (North Façade)	Light Grey Exterior Window Caulk (26)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – 0.82 mg/Kg Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND
07 PCB 062819	Front Door - North Façade	Grey Exterior Door Caulk (28)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – ND Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND
08 PCB 062819	Basement - Exterior Window Well Grate Cover	Caulk at Exterior Window Well Grate Cover (30)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – 15,000 mg/Kg Aroclor 1260 – 27,000 mg/Kg Aroclor 1262 – ND Aroclor 1268 – ND
09 PCB 062819	Exterior Aluminum Casing Seams to Brick Exterior Wood Trim to Brick Under Aluminum Casing	Brown Exterior Window Caulk at Metal Casing to Brick (31) White Exterior Window Caulk (Under Metal) at Wood Trim and Brick (32)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – ND Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND
05 PCB 062819	South Concrete Stair Seams/Cracks	White Exterior Louver Caulk (13)	Aroclor 1016 – ND Aroclor 1221 – ND Aroclor 1232 – ND Aroclor 1242 – ND Aroclor 1248 – ND Aroclor 1254 – ND Aroclor 1260 – ND Aroclor 1262 – ND Aroclor 1268 – ND

Note: ND = Indicates that the analyte was not detected at the reporting limit

4.4 Non-Liquid PCBs Recommendations

As stated, the EPA defines PCBs as those materials which are greater than, or equal to, 50 milligrams per kilogram (mg/Kg), which is equivalent to 50 parts per million (ppm). If any additional suspect PCB caulks/sealants are disclosed they should be sampled per EPA. Dispose of generated waste materials that contain non-liquid PCBs in compliance with the Toxic Substance Control Act (TSCA). The disposal of PCB remediation waste is regulated under 40 CFR 761.61

of TSCA. Specifications should be developed for the remediation of non-liquid PCB containing materials greater than or equal to 50 mg/Kg.

4.5 Non-Liquid PCB Laboratory Certification

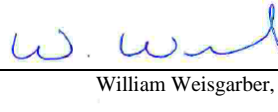
The State of New Jersey, Department of Environmental Protection (NJDEP) is a National Environmental Laboratory Accreditation Program (NELAP) Recognized Accreditation Body. NJDEP certifies that the laboratory indicated below is approved as a Nationally Accredited Environmental Laboratory to perform the analysis of non-liquid PCB in accordance with the EPA Method SW-846 8082A.


EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NEW JERSEY 08077

The inspectors who physically sampled for PCB at the facility are:

WILLIAM WEISGARBER, JR. & RICHARD REYNOLDS
USA ENVIRONMENTAL MANAGEMENT, INC.
344 WEST STATE STREET
TRENTON, NEW JERSEY 08618

SIGNATURE OF INSPECTOR(S): _____


William Weisgarber, Jr.


Richard J. Reynolds

5.0 MICROBIAL GROWTH

5.1 Visual Assessment for Microbial Growth

Although not indicated in the Scope of Work for Hazardous Materials, USAEMI conducted a limited visual microbial assessment. The observations of the inspectors included, significant microbial growth observed on porous material (wood, drywall, ceiling tiles, etc.) throughout the basement. In addition, efflorescing plaster was observed in the stairwell and various other locations of water infiltration. Minor water staining to ceiling tiles was also observed on various floors. The growth is likely resulting from the high humidity levels and the water infiltration from the exterior.

5.2 Microbial Recommendations

Removal, cleaning and disinfecting of the microbial impacted surfaces should be conducted in accordance with State of New Jersey, Department of Health, Public Employees Occupational Safety and Health (PEOSH) Program *Mold in the Workplace Prevention and Control* Bulletin, the

Institute of Inspection Cleaning and Restoration Certification (IICRC) *S520 Standard and Reference Guide for Professional Mold Remediation* and IICRC *S100 Standard and Reference Guide for Professional Carpet Cleaning*. Post remediation verification by an Industrial Hygienist should be conducted - verification to include visual inspection, odor detection and analytical testing to verify the structure, system and contents have been returned to a Condition 1 in accordance with IICRC. Condition 1, includes normal fungal ecology with Condition 2 consisting of an environment which is primarily contaminated with settled spores that were dispersed directly or indirectly from a Condition 3, which is actual growth.

APPENDIX A

Asbestos Certificates of Analysis
Asbestos Chain of Custody Records

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc. 344 West State Street Trenton NJ 08618	Report Date: 7/11/2019 Report No.: 593619 - PLM Project: Restoration Upgrades to Exterior Building Envelope Project No.: 19-020046-03	Rev #2, 7/22/2019
Client: USA351		

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822076 Client No.: 01-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: White Plaster Client Description: White Textured Finish Coat Plaster (01) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: 4th Fl, 431 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822077 Client No.: 01A-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Grey Plaster Client Description: Grey Rough Coat Plaster (02) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: 4th Fl, 431 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822078 Client No.: 02-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: White Plaster Client Description: White Textured Finish Coat Plaster (01) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: 4th Fl, 419 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822079 Client No.: 02A-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Grey Plaster Client Description: Grey Rough Coat Plaster (02) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: 4th Fl, 419 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822080 Client No.: 03-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: White Plaster Client Description: White Textured Finish Coat Plaster (01) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: 3rd Fl, 330 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822081 Client No.: 03A-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Grey Plaster Client Description: Grey Rough Coat Plaster (02) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: 3rd Fl, 330 Facility: <u>Percent Non-Fibrous Material:</u> 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/01/2019
Signature:
Analyst: Tiffany Lowe

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822082 **Analyst Observation:** White Plaster **Location:** 3rd Fl, 309
Client No.: 04-RR062819 **Client Description:** White Textured Finish Coat Plaster (01) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822083 **Analyst Observation:** Grey Plaster **Location:** 3rd Fl, 309
Client No.: 04A-RR062819 **Client Description:** Grey Rough Coat Plaster (02) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

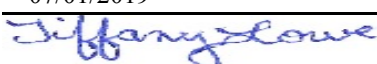
Lab No.: 6822084 **Analyst Observation:** White Plaster **Location:** 2nd Fl, 209
Client No.: 05-RR062819 **Client Description:** White Textured Finish Coat Plaster (01) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

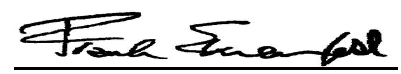
Lab No.: 6822085 **Analyst Observation:** Grey Plaster **Location:** 2nd Fl, 209
Client No.: 05A-RR062819 **Client Description:** Grey Rough Coat Plaster (02) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822085(L2) **Analyst Observation:** Dk Grey Plaster **Location:** 2nd Fl, 209
Client No.: 05A-RR062819 **Client Description:** Grey Rough Coat Plaster (02) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822086 **Analyst Observation:** White Plaster **Location:** 1st Fl, 102
Client No.: 06-RR062819 **Client Description:** White Textured Finish Coat Plaster (01) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/01/2019
Signature: 
Analyst: Tiffany Lowe

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822087 **Analyst Observation:** Grey Plaster **Location:** 1st Fl, 102
Client No.: 06A-RR062819 **Client Description:** Grey Rough Coat Plaster (02) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822088 **Analyst Observation:** White Plaster **Location:** Basement 8, Library
Client No.: 07-RR062819 **Client Description:** White Textured Finish Coat Plaster (01) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100


Lab No.: 6822089 **Analyst Observation:** Grey Plaster **Location:** Basement 8, Library
Client No.: 07A-RR062819 **Client Description:** Grey Rough Coat Plaster (02) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

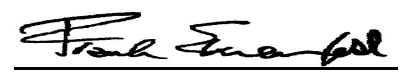
Lab No.: 6822089(L2) **Analyst Observation:** Dk Grey Plaster **Location:** Basement 8, Library
Client No.: 07A-RR062819 **Client Description:** Grey Rough Coat Plaster (02) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822090 **Analyst Observation:** White Drywall **Location:** 3rd Fl, 312
Client No.: 08-RR062819 **Client Description:** Gypsum Paper Drywall And Assoc. Joint Compound (03) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 5 Cellulose 95

Lab No.: 6822090(L2) **Analyst Observation:** White Joint Compound **Location:** 3rd Fl, 312
Client No.: 08-RR062819 **Client Description:** Gypsum Paper Drywall And Assoc. Joint Compound (03) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/01/2019
Signature: 
Analyst: Tiffany Lowe

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618


Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

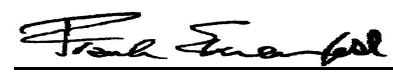
Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822091	Analyst Observation: White Drywall	Location: 2nd Fl, 229
Client No.: 09-RR062819	Client Description: Gypsum Paper Drywall And Assoc. Joint Compound (03)	Facility:
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> 5 Cellulose 5 Fibrous Glass	<u>Percent Non-Fibrous Material:</u> 90
Lab No.: 6822091(L2)	Analyst Observation: White Joint Compound	Location: 2nd Fl, 229
Client No.: 09-RR062819	Client Description: Gypsum Paper Drywall And Assoc. Joint Compound (03)	Facility:
<u>Percent Asbestos:</u> <i>None Detected</i>	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<u>Percent Non-Fibrous Material:</u> 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/01/2019
Signature: 
Analyst: Tiffany Lowe

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822092 **Analyst Observation:** Brown/White Caulk **Location:** 1st Fl, 102
Client No.: 10-RR062819 **Client Description:** Brown Interior Window Caulk At Metal **Facility:**
Casing To Wall Interface (04)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822093 **Analyst Observation:** Brown/White Caulk **Location:** 3rd Fl, 306
Client No.: 11-RR062819 **Client Description:** Brown Interior Window Caulk At Metal **Facility:**
Casing To Wall Inface (04)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100


Lab No.: 6822094 **Analyst Observation:** White Caulk **Location:** 1st Fl, 102
Client No.: 12-RR062819 **Client Description:** White Interior Window Caulk At Wood **Facility:**
Casing/Trim To Wall To Wall Interface (05)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

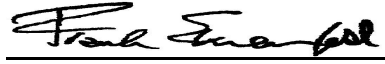
Lab No.: 6822095 **Analyst Observation:** White Caulk **Location:** 3rd Fl, 306
Client No.: 13-RR062819 **Client Description:** White Interior Window Caulk At Wood **Facility:**
Casing/Trim To Wall To Wall Interface (05)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822096 **Analyst Observation:** Black Roof Material **Location:** R1
Client No.: 14-RR062819 **Client Description:** Roof Field W/Stone Ballast (Type 1) (06) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 5 Cellulose 85
10 Fibrous Glass

Lab No.: 6822096(L2) **Analyst Observation:** Brown Insulation **Location:** R1
Client No.: 14-RR062819 **Client Description:** Roof Field W/Stone Ballast (Type 1) (06) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 60 Cellulose 40

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Robert Betsch

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822097 **Analyst Observation:** Black Roof Material **Location:** R1
Client No.: 15-RR062819 **Client Description:** Roof Field W/Stone Ballast (Type 1) (06) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 5 Cellulose 85
10 Fibrous Glass

Lab No.: 6822097(L2) **Analyst Observation:** Brown Insulation **Location:** R1
Client No.: 15-RR062819 **Client Description:** Roof Field W/Stone Ballast (Type 1) (06) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 60 Cellulose 40


Lab No.: 6822098 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 16-RR062819 **Client Description:** Felt On ISO Board Under ID No. 06 (07) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 2 Fibrous Glass 98

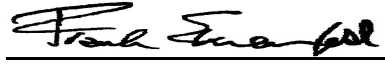
Lab No.: 6822099 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 17-RR062819 **Client Description:** Felt On ISO Board Under ID No. 06 (07) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 2 Fibrous Glass 98

Lab No.: 6822099(L2) **Analyst Observation:** Brown Insulation **Location:** R1
Client No.: 17-RR062819 **Client Description:** Felt On ISO Board Under ID No. 06 (07) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 70 Cellulose 30

Lab No.: 6822099(L3) **Analyst Observation:** Yellow Foam **Location:** R1
Client No.: 17-RR062819 **Client Description:** Felt On ISO Board Under ID No. 06 (07) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Robert Betsch

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822100 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 18-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck **Facility:**
Under ID No. 06 And 07 (08)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 2 Fibrous Glass 98

Lab No.: 6822100(L2) **Analyst Observation:** Brown Insulation **Location:** R1
Client No.: 18-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck **Facility:**
Under ID No. 06 And 07 (08)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 60 Cellulose 40


Lab No.: 6822100(L3) **Analyst Observation:** Yellow Foam **Location:** R1
Client No.: 18-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck **Facility:**
Under ID No. 06 And 07 (08)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

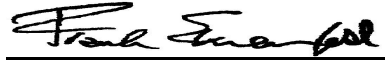
Lab No.: 6822101 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 19-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck **Facility:**
Under ID No. 06 And 07 (08)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 7 Cellulose 93

Lab No.: 6822101(L2) **Analyst Observation:** Yellow Foam **Location:** R1
Client No.: 19-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck **Facility:**
Under ID No. 06 And 07 (08)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822102 **Analyst Observation:** Black/Grey Shingle **Location:** R1
Client No.: 20-RR062819 **Client Description:** Grey Mineral Coat Flashing On Parapet **Facility:**
Curbs (Type 1) (09)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 10 Cellulose 90

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Robert Betsch

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822102(L2) **Analyst Observation:** Black Tar **Location:** R1
Client No.: 20-RR062819 **Client Description:** Grey Mineral Coat Flashing On Parapet Curbs (Type 1) (09) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822103 **Analyst Observation:** Black/Grey Shingle **Location:** R1
Client No.: 21-RR062819 **Client Description:** Grey Mineral Coat Flashing On Parapet Curbs (Type 1) (09) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 10 Cellulose 90


Lab No.: 6822103(L2) **Analyst Observation:** Black Tar **Location:** R1
Client No.: 21-RR062819 **Client Description:** Grey Mineral Coat Flashing On Parapet Curbs (Type 1) (09) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

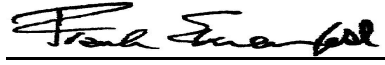
Lab No.: 6822104 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 22-RR062819 **Client Description:** Tar/Asphalt On Parapet And Curbs Under ID No. 09 (Type 1) (10) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
PC 4.2 Chrysotile 10 Cellulose 85.8

Lab No.: 6822105 **Analyst Observation:** Sample Not Analyzed **Location:** R1
Client No.: 23-RR062819 **Client Description:** Tar/Asphalt On Parapet And Curbs Under ID No. 09 (10) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
Sample Not Analyzed Sample Not Analyzed

Lab No.: 6822106 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 24-RR062819 **Client Description:** Tar Coating At Caping Seams (11) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Robert Betsch

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822107 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 25-RR062819 **Client Description:** Tar Coating At Caping Seams (11) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100


Lab No.: 6822108 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 26-RR062819 **Client Description:** Tar/Asphalt At Pitch Parking (12) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 5 Cellulose 95

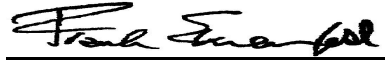
Lab No.: 6822109 **Analyst Observation:** Black Tar **Location:** R1
Client No.: 27-RR062819 **Client Description:** Tar/Asphalt At Pitch Parking (12) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 5 Cellulose 95

Lab No.: 6822110 **Analyst Observation:** Grey Caulk **Location:** Penthouse Exterior
Client No.: 28-RR062819 **Client Description:** White Ext. Lower Caulk (13) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822111 **Analyst Observation:** Grey Caulk **Location:** Penthouse Exterior
Client No.: 29-RR062819 **Client Description:** White Ext. Lower Caulk (13) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Robert Betsch

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director


CERTIFICATE OF ANALYSIS

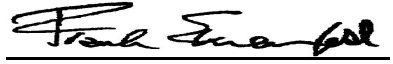
Client: USA Environmental Mgmt. Inc. 344 West State Street Trenton NJ 08618	Report Date: 7/11/2019 Report No.: 593619 - PLM Project: Restoration Upgrades to Exterior Building Envelope Project No.: 19-020046-03	Rev #2, 7/22/2019
Client: USA351		

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822112 Client No.: 30-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: White Glazing Client Description: White Ext. Window Glazing (14) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Penthouse Exterior Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822113 Client No.: 31-RR062819 <u>Percent Asbestos:</u> <i>PC Trace Chrysotile</i>	Analyst Observation: White Glazing Client Description: White Ext. Window Glazing (14) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Penthouse Exterior Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822114 Client No.: 32-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Black Tar Client Description: Tar At Seams Of Copper Walls (15) <u>Percent Non-Asbestos Fibrous Material:</u> 15 Cellulose	Location: Penthouse Wall Exterior Facility: <u>Percent Non-Fibrous Material:</u> 85
Lab No.: 6822115 Client No.: 33-RR062819 <u>Percent Asbestos:</u> <i>PC 1.8 Chrysotile</i>	Analyst Observation: Black Tar Client Description: Tar At Seams Of Copper Walls (15) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Penthouse Wall Exterior Facility: <u>Percent Non-Fibrous Material:</u> 98.2
Lab No.: 6822116 Client No.: 34-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Clear Caulk Client Description: Clear Glazing Assoc. With Door Windows (16) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Penthouse Door Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822117 Client No.: 35-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Clear Caulk Client Description: Clear Glazing Assoc. With Door Windows (16) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Penthouse Door Facility: <u>Percent Non-Fibrous Material:</u> 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Jeffrey Fazzo

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822118 **Analyst Observation:** White Caulk **Location:** Penthouse Exterior Wall
Client No.: 36-RR062819 **Client Description:** White Sealant At Ext. Electrical Conduit Penetrations (17) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822118(L2) **Analyst Observation:** Grey Caulk **Location:** Penthouse Exterior Wall
Client No.: 36-RR062819 **Client Description:** White Sealant At Ext. Electrical Conduit Penetrations (17) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822119 **Analyst Observation:** Grey Sealant **Location:** Penthouse Exterior Wall
Client No.: 37-RR062819 **Client Description:** White Sealant At Ext. Electrical Conduit Penetrations (17) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822119(L2) **Analyst Observation:** White Coating **Location:** Penthouse Exterior Wall
Client No.: 37-RR062819 **Client Description:** White Sealant At Ext. Electrical Conduit Penetrations (17) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822120 **Analyst Observation:** Black Roof Material **Location:** R2 - Penthouse
Client No.: 38-RR062819 **Client Description:** Roof Field W/Stone Ballast (Type 2) (18) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 15 Fibrous Glass 84
1 Cellulose

Lab No.: 6822120(L2) **Analyst Observation:** Tan Fibrous **Location:** R2 - Penthouse
Client No.: 38-RR062819 **Client Description:** Roof Field W/Stone Ballast (Type 2) (18) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 95 Cellulose 5

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature:
Analyst: Jeffrey Fazzo

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822121 **Analyst Observation:** Black Roof Material **Location:** R2 - Penthouse
Client No.: 39-RR062819 **Client Description:** Roof Field W/Stone Ballast (Type 2) (18) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 15 Fibrous Glass 85
Trace Cellulose

Lab No.: 6822121(L2) **Analyst Observation:** Tan Fibrous **Location:** R2 - Penthouse
Client No.: 39-RR062819 **Client Description:** Roof Field W/Stone Ballast (Type 2) (18) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 95 Cellulose 5

Lab No.: 6822122 **Analyst Observation:** Black Felt **Location:** R2 - Penthouse
Client No.: 40-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck Under ID No. 18 (Type 2) (19) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 90 Cellulose 5
5 Fibrous Glass

Lab No.: 6822122(L2) **Analyst Observation:** Black Tar **Location:** R2 - Penthouse
Client No.: 40-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck Under ID No. 18 (Type 2) (19) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822123 **Analyst Observation:** Black Felt **Location:** R2 - Penthouse
Client No.: 41-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck Under ID No. 18 (Type 2) (19) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 90 Cellulose 5
5 Fibrous Glass

Lab No.: 6822123(L2) **Analyst Observation:** Lt Yellow Foam **Location:** R2 - Penthouse
Client No.: 41-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck Under ID No. 18 (Type 2) (19) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature:
Analyst: Jeffrey Fazzo

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822123(L3) **Analyst Observation:** Black Tar **Location:** R2 - Penthouse
Client No.: 41-RR062819 **Client Description:** Tar/Asphalt On Concrete Roof Deck Under ID No. 18 (Type 2) (19) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
PC 0.25 Chrysotile None Detected 99.75

Lab No.: 6822124 **Analyst Observation:** Black Shingle **Location:** R2 - Penthouse
Client No.: 42-RR062819 **Client Description:** Grey Mineral Coat Flashing At Parapet (Type 2) (20) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 15 Synthetic 85

Lab No.: 6822124(L2) **Analyst Observation:** Black Tar **Location:** R2 - Penthouse
Client No.: 42-RR062819 **Client Description:** Grey Mineral Coat Flashing At Parapet (Type 2) (20) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822125 **Analyst Observation:** Black Shingle **Location:** R2 - Penthouse
Client No.: 43-RR062819 **Client Description:** Grey Mineral Coat Flashing At Parapet (Type 2) (20) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 15 Synthetic 85

Lab No.: 6822125(L2) **Analyst Observation:** Black Tar **Location:** R2 - Penthouse
Client No.: 43-RR062819 **Client Description:** Grey Mineral Coat Flashing At Parapet (Type 2) (20) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822125(L3) **Analyst Observation:** Black Fibrous Backing **Location:** R2 - Penthouse
Client No.: 43-RR062819 **Client Description:** Grey Mineral Coat Flashing At Parapet (Type 2) (20) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 50 Fibrous Glass 50

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature:
Analyst: Jeffrey Fazzo

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822126 **Analyst Observation:** Black Tar **Location:** R2 - Penthouse
Client No.: 44-RR062819 **Client Description:** Tar/Asphalt On Parapet Under ID No. 20 (Type 2) (21) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822127 **Analyst Observation:** Black Tar **Location:** R2 - Penthouse
Client No.: 45-RR062819 **Client Description:** Tar/Asphalt On Parapet Under ID No. 20 (Type 2) (21) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 10 Cellulose 90


Lab No.: 6822128 **Analyst Observation:** Black Tar **Location:** R2 - Penthouse
Client No.: 46-RR062819 **Client Description:** Tar/Asphalt At Seams Of Flashings ID No. 09 And 20 (22) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 15 Cellulose 85

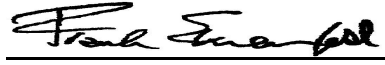
Lab No.: 6822129 **Analyst Observation:** Black Tar **Location:** R1 At Parapet
Client No.: 47-RR062819 **Client Description:** Tar/Asphalt At Seams Of Flashings ID No. 09 And 20 (22) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected 17 Cellulose 83

Lab No.: 6822130 **Analyst Observation:** Grey Caulk **Location:** Penthouse Window
Client No.: 48-RR062819 **Client Description:** Grey Exterior Window Caulk At Penthouse (23) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822131 **Analyst Observation:** Grey Caulk **Location:** Penthouse Window
Client No.: 49-RR062819 **Client Description:** Grey Exterior Window Caulk At Penthouse (23) **Facility:**
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Jeffrey Fazzo

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618


Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

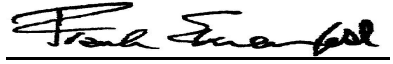
Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822132 Client No.: 50-RR062819	Analyst Observation: White Sealant Client Description: Grey Tar Coating At Chimney Stack (24)	Location: R1 At Chimney/Stack Facility:
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822132(L2) Client No.: 50-RR062819	Analyst Observation: Grey Sealant Client Description: Grey Tar Coating At Chimney Stack (24)	Location: R1 At Chimney/Stack Facility:
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822133 Client No.: 51-RR062819	Analyst Observation: White Sealant Client Description: Grey Tar Coating At Chimney Stack (24)	Location: R1 At Chimney/Stack Facility:
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822133(L2) Client No.: 51-RR062819	Analyst Observation: Grey Sealant Client Description: Grey Tar Coating At Chimney Stack (24)	Location: R1 At Chimney/Stack Facility:
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822134 Client No.: 52-RR062819	Analyst Observation: Black Caulk Client Description: Brown Exterior Door Caulk (25)	Location: East Exterior Door Basement Facility:
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822135 Client No.: 53-RR062819	Analyst Observation: Black Caulk Client Description: Brown Exterior Door Caulk (25)	Location: 1st Fl South Exterior Door Facility:
<u>Percent Asbestos:</u> None Detected	<u>Percent Non-Asbestos Fibrous Material:</u> None Detected	<u>Percent Non-Fibrous Material:</u> 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Jeffrey Fazzo

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822136 **Analyst Observation:** Lt Grey Caulk **Location:** 1st Fl At Small 1'x4' Window (1)
Client No.: 54-RR062819 **Client Description:** Light Grey Exterior Window Caulk (26) Exterior North
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822136(L2) **Analyst Observation:** White Caulk **Location:** 1st Fl At Small 1'x4' Window (1)
Client No.: 54-RR062819 **Client Description:** Light Grey Exterior Window Caulk (26) Exterior North
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

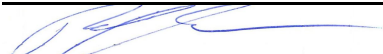
Lab No.: 6822137 **Analyst Observation:** Lt Grey Caulk **Location:** 1st Fl At Small 1'x4' Window
Client No.: 55-RR062819 **Client Description:** Light Grey Exterior Window Caulk (26) Well (2) Exterior North
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

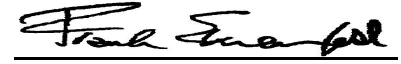
Lab No.: 6822138 **Analyst Observation:** Tan Glazing **Location:** 1st Fl At Small 1'x4' Window (1)
Client No.: 56-RR062819 **Client Description:** Grey Exterior Window Glazing (27) Exterior North
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822139 **Analyst Observation:** Tan Glazing **Location:** 1st Fl At Small 1'x4' Window (2)
Client No.: 57-RR062819 **Client Description:** Grey Exterior Window Glazing (27) Exterior North
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822140 **Analyst Observation:** Grey Caulk **Location:** 1st Fl Main Floor Exterior North
Client No.: 58-RR062819 **Client Description:** Grey Exterior Door Caulk (28) Exterior North
Facility:
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Randy Caran

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director


CERTIFICATE OF ANALYSIS

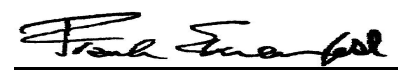
Client: USA Environmental Mgmt. Inc. 344 West State Street Trenton NJ 08618	Report Date: 7/11/2019 Report No.: 593619 - PLM Project: Restoration Upgrades to Exterior Building Envelope Project No.: 19-020046-03	Rev #2, 7/22/2019
Client: USA351		

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822141 Client No.: 59-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Grey Caulk Client Description: Grey Exterior Door Caulk (28) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: 1st Fl Main Floor Exterior North Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822142 Client No.: 60-RR062819 <u>Percent Asbestos:</u> <i>PC 7.5 Chrysotile</i>	Analyst Observation: Black Tar Client Description: Black Tar Coating Over Exterior Window Well (29) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Basement Window Well (12) Exterior East Facility: <u>Percent Non-Fibrous Material:</u> 92.5
Lab No.: 6822143 Client No.: 61-RR062819 <u>Percent Asbestos:</u> <i>Sample Not Analyzed</i>	Analyst Observation: Sample Not Analyzed Client Description: Black Tar Coating Over Exterior Window Well (29) <u>Percent Non-Asbestos Fibrous Material:</u> Sample Not Analyzed	Location: Basement Window Well (4) Exterior West Facility: <u>Percent Non-Fibrous Material:</u>
Lab No.: 6822144 Client No.: 62-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Off-White Caulk Client Description: Caulk At Exterior Window Well Grate Cover (30) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Basement Window (1) Exterior East Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822145 Client No.: 63-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Off-White Caulk Client Description: Caulk At Exterior Window Well Grate Cover (30) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Basement Window (1) Exterior East Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 6822146 Client No.: 64-RR062819 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Black Caulk Client Description: Brown Exterior Window Caulk At Metal Casing To Brick (31) <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: 3rd Fl Window (2) Exterior East Facility: <u>Percent Non-Fibrous Material:</u> 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Randy Caran

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822147 **Analyst Observation:** Black Caulk **Location:** 1st Fl Window (15) Exterior West
Client No.: 65-RR062819 **Client Description:** Brown Exterior Window Caulk At Metal **Facility:**
Casing To Brick (31)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822148 **Analyst Observation:** Off-White Caulk **Location:** 3rd Fl Window (2) Exterior East
Client No.: 66-RR062819 **Client Description:** White Exterior Window Caulk (Under **Facility:**
Metal) At Wood To Brick (32)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100


Lab No.: 6822149 **Analyst Observation:** Off-White Caulk **Location:** 1st Fl Window (15) Exterior West
Client No.: 67-RR062819 **Client Description:** White Exterior Window Caulk (Under **Facility:**
Metal) At Wood To Brick (32)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

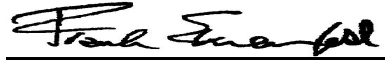
Lab No.: 6822150 **Analyst Observation:** Grey Caulk **Location:** Door Exterior East
Client No.: 68-RR062819 **Client Description:** White Exterior Door Caulk Remnants **Facility:**
(33)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822151 **Analyst Observation:** Grey Caulk **Location:** Door Exterior East
Client No.: 69-RR062819 **Client Description:** White Exterior Door Caulk Remnants **Facility:**
(33)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Lab No.: 6822152 **Analyst Observation:** Grey Caulk **Location:** Exterior Stair North Facade
Client No.: 70-RR062819 **Client Description:** White Sealant At Seams/Cracks Of **Facility:**
Concrete Exterior Stairs (34)
Percent Asbestos: Percent Non-Asbestos Fibrous Material: Percent Non-Fibrous Material:
None Detected None Detected 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Randy Caran

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822153
Client No.: 71-RR062819

Analyst Observation: Grey Caulk
Client Description: White Sealant At Seams/Cracks Of Concrete Exterior Stairs (34)


Location: Exterior Stair South Facade
Facility:

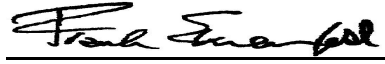
Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/02/2019
Signature: 
Analyst: Randy Caran

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - PLM
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

Appendix to Analytical Report

Customer Contact: Bill Weisgarber

Method: 40 CFR Appendix E to Subpart E of Part 763, interim method for the Determination of Asbestos in Bulk Insulation Samples, and USEPA 600, R93-116 as needed.

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com

iATL Office Manager: wchampion@iatl.com

iATL Account Representative: Shirley Clark

Sample Login Notes: See Batch Sheet Attached

Sample Matrix: Bulk Building Materials

Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis by US EPA 600 93-116: Determination of Asbestos in Bulk Building Materials by Polarized Light Microscopy (PLM).

Certifications:

- NIST-NVLAP No. 101165-0
- NYSDOH-ELAP No. 11021
- AIHA-LAP, LLC No. 100188

Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. PC Trace represents a <0.25% amount. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analytical Methodology Alternatives: Your initial request for analysis may not have accounted for recent advances in regulatory requirements or advances in technology that are routinely used in similar situations for other qualified projects. You may have the option to explore additional analysis for further information. Below are a few options, listed as the matrix followed by the appropriate methodology. Also included are links to more information on our website.

Bulk Building Materials that are Non-Friable Organically Bound (NOB) by Gravimetric Reduction techniques employing PLM and TEM: ELAP 198.6 (PLM-NOB), ELAP 198.4 (TEM-NOB)

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Project No.: 19-020046-03

Client: USA351

Loose Fill Vermiculite Insulation, Attic Insulation, Zonolite (copyright), etc.: US EPA 600 R-4/004 (multi-tiered analytical process)
Sprayed On Insulation/Fireproofing with Vermiculite (SOF-V): ELAP 198.8 (PLM-SOF-V)

Soil, sludge, sediment, aggregate, and like materials analyzed for asbestos or other elongated mineral particles (ex. erionite, etc.): ASTM D7521, CARB 435, and other options available

Asbestos in Surface Dust according to one of ASTM's Methods (very dependent on sampling collection technique – by TEM): ASTM D 5755, D5756, or D6480

Various other asbestos matrices (air, water, etc.) and analytical methods are available.

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a list with highlighted disclaimers that may be pertinent to this project. For a full explanation of these and other disclaimers, please inquire at customerservice@iatl.com.

- 1) Note: No mastic provided for analysis.
- 2) Note: Insufficient mastic provided for analysis.
- 3) Note: Insufficient material provided for analysis.
- 4) Note: Insufficient sample provided for QC reanalysis.
- 5) Note: Different material than indicated on Sample Log / Description.
- 6) Note: Sample not submitted.
- 7) Note: Attached to asbestos containing material.
- 8) Note: Received wet.
- 9) Note: Possible surface contamination.
- 10) Note: Not building material. 1% threshold may not apply.
- 11) Note: Recommend TEM-NOB analysis as per EPA recommendations.
- 12) Note: Asbestos detected but not quantifiable.
- 13) Note: Multiple identical samples submitted, only one analyzed.
- 14) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.080%.
- 15) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.125%.
- 16) Note: This sample contains >10% vermiculite mineral. See Appendix for Recommendations for Vermiculite Analysis.

Recommendations for Vermiculite Analysis:

Several analytical protocols exist for the analysis of asbestos in vermiculite. These analytical approaches vary depending upon the nature of the vermiculite mineral being tested (e.g. un-processed gange, homogeneous exfoliated books of mica, or mixed mineral composites). Please contact your client representative for pricing and turnaround time options available.

iATL recommends initial testing using the EPA 600/R-93/116 method. This method is specifically designed for the analysis of asbestos in bulk building materials. It provides an acceptable starting point for primary screening of vermiculite for possible asbestos.

Results from this testing may be inconclusive. EPA suggests proceeding to a multi-tiered analysis involving wet separation techniques in conjunction with PLM and TEM gravimetric analysis (EPA 600/R-04/004).

For New York State customers, NYSDOH requires disclaimers and qualifiers for various vermiculite containing samples that direct analysis via ELAP198.6 and ELAP198.8 for samples that contain >10% vermiculite mineral where ELAP198.6 may be used to evaluate the asbestos content of the material. However, any test result using ELAP198.6 will be reported with the following disclaimer: "ELAP198.6 method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing >10% vermiculite."

Further information on this method and other vermiculite and asbestos issues can be found at the following: Agency for Toxic Substances and Disease Registry (ATSDR) www.atsdr.cdc.gov, United States Geological Survey (USGS) www.minerals.usgs.gov/minerals/, US EPA www.epa.gov/asbestos. The USEPA also has an informative brochure "Current Best Practices for Vermiculite Attic Insulation" EPA 747F03001 May 2003, that may assist the health and remediation professional.

The following is a summary of the analytical process outlines in the EPA 600/R-04/004 Method:

1) **Analytical Step/Method:** Initial Screening by PLM, EPA 600R-93/116
Requirements/Comments: Minimum of 0.1 g of sample. ~0.25% LOQ for most samples.

2) **Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

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Project No.: 19-020046-03

Client: USA351

3)**Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Floats" only.

4)**Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

5)**Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Suspension" only.

LOQ, Limit of Quantitation estimates for mass and volume analyses.

*With advance notice and confirmation by the laboratory.

**Approximately 1 Liter of sample in double-bagged container (~9x6 inch bag of sample).

CERTIFICATE OF ANALYSIS

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344 West State Street
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Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822093
Client No.: 11-RR062819
Description: Brown/White Caulk
% Asbestos Detected:
None Detected

Facility:
Location: 3rd Fl, 306
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 85.9 %
Gravimetrically Reduced Subsample: 14.1%
% Non-Fibrous Material:
14.1 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
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Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822095
Client No.: 13-RR062819
Description: White Caulk
% Asbestos Detected:
None Detected


Facility:
Location: 3rd Fl, 306

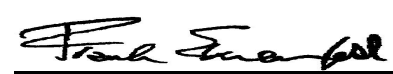
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 61.4 %
Gravimetrically Reduced Subsample: 38.6%

% Non-Fibrous Material:
38.6 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
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Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY

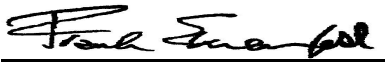
Lab No.: 6822097
Client No.: 15-RR062819
Description: Black Roof Material
% Asbestos Detected:
Trace Chrysotile, Detected at
<0.25%

Facility:
Location: R1
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 94.7 %
Gravimetrically Reduced Subsample: 5.3%
% Non-Fibrous Material:
5.3 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

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Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822099
Client No.: 17-RR062819
Description: Black Tar
% Asbestos Detected:
None Detected

Facility:
Location: R1
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 94.0 %
Gravimetrically Reduced Subsample: 6.0%
% Non-Fibrous Material:
6 Vanadium
Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

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Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822101
Client No.: 19-RR062819
Description: Black Tar
% Asbestos Detected:
None Detected

Facility:
Location: R1
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 97.3 %
Gravimetrically Reduced Subsample: 2.7%
% Non-Fibrous Material:
2.7 Vanadium
Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
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Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822103
Client No.: 21-RR062819
Description: Black/Grey Shingle
% Asbestos Detected:
None Detected

Facility:
Location: R1
% Non-Asbestos Fibrous Material:
0.6 SiAl, Other Fiber

Organic Fraction: 68.4 %
Gravimetrically Reduced Subsample: 31.6%
% Non-Fibrous Material:
31 Other

Lab No.: 6822103(L2)
Client No.: 21-RR062819
Description: Black Tar
% Asbestos Detected:
Trace Chrysotile, Detected at <0.25%

Facility:
Location: R1
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 86.8 %
Gravimetrically Reduced Subsample: 13.2%
% Non-Fibrous Material:
13.2 Vanadium
Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature:
Analyst: Mark Stewart

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

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Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822107
Client No.: 25-RR062819
Description: Black Tar
% Asbestos Detected:
None Detected

Facility:
Location: R1
% Non-Asbestos Fibrous Material:
0.2 SiAl, Other Fiber

Organic Fraction: 84.1 %
Gravimetrically Reduced Subsample: 15.9%
% Non-Fibrous Material:
15.7 Vanadium
Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

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Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822109
Client No.: 27-RR062819
Description: Black Tar
% Asbestos Detected:
None Detected

Facility:
Location: R1
% Non-Asbestos Fibrous Material:
0.7 SiAl, Other Fiber

Organic Fraction: 85.6 %
Gravimetrically Reduced Subsample: 14.4%
% Non-Fibrous Material:
13.7 Vanadium
Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

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Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822111
Client No.: 29-RR062819
Description: Grey Caulk
% Asbestos Detected:
None Detected


Facility:
Location: Penthouse Exterior


% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 82.8 %
Gravimetrically Reduced Subsample: 17.2%

% Non-Fibrous Material:
17.2 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

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Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822113
Client No.: 31-RR062819
Description: White Glazing
% Asbestos Detected:
0.6 Chrysotile


Facility:
Location: Penthouse Exterior


% Non-Asbestos Fibrous Material:
1.2 SiMg, Talc

Organic Fraction: 38.1 %
Gravimetrically Reduced Subsample: 61.9%

% Non-Fibrous Material:
60 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

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Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822117
Client No.: 35-RR062819
Description: Clear Caulk
% Asbestos Detected:
None Detected


Facility:
Location: Penthouse Door


% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 67.2 %
Gravimetrically Reduced Subsample: 32.8%

% Non-Fibrous Material:
32.8 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY

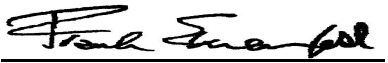
Lab No.: 6822119
Client No.: 37-RR062819
Description: Grey Sealant
% Asbestos Detected:
None Detected

Facility:
Location: Penthouse Exterior Wall
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 14.3 %
Gravimetrically Reduced Subsample: 85.7%
% Non-Fibrous Material:
85.7 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822121
Client No.: 39-RR062819
Description: Black Roof Material
% Asbestos Detected:
Trace Chrysotile, Detected at
<0.25%

Facility:
Location: R2 - Penthouse
% Non-Asbestos Fibrous Material:
Trace SiAl, Other Fiber

Organic Fraction: 93.9 %
Gravimetrically Reduced Subsample: 6.1%
% Non-Fibrous Material:
6.1 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822123
Client No.: 41-RR062819
Description: Black Felt
% Asbestos Detected:
None Detected

Facility:
Location: R2 - Penthouse
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 94.6 %
Gravimetrically Reduced Subsample: 5.4%
% Non-Fibrous Material:
5.4 Other

Lab No.: 6822123(L3)
Client No.: 41-RR062819
Description: Black Tar
% Asbestos Detected:
0.3 Chrysotile

Facility:
Location: R2 - Penthouse
% Non-Asbestos Fibrous Material:
3.3 SiAl, Other Fiber

Organic Fraction: 67.3 %
Gravimetrically Reduced Subsample: 32.7%
% Non-Fibrous Material:
29.1 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature:
Analyst: Mark Stewart

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822125
Client No.: 43-RR062819
Description: Black Shingle
% Asbestos Detected:
None Detected

Facility:
Location: R2 - Penthouse
% Non-Asbestos Fibrous Material:
0.2 SiAl, Other Fiber

Organic Fraction: 76.3 %
Gravimetrically Reduced Subsample: 23.7%
% Non-Fibrous Material:
23.5 Other

Lab No.: 6822125(L2)
Client No.: 43-RR062819
Description: Black Tar
% Asbestos Detected:
None Detected

Facility:
Location: R2 - Penthouse
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 92.3 %
Gravimetrically Reduced Subsample: 7.7%
% Non-Fibrous Material:
7.7 Vanadium
Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature:
Analyst: Mark Stewart

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822127
Client No.: 45-RR062819
Description: Black Tar
% Asbestos Detected:
0.5 Chrysotile


Facility:
Location: R2 - Penthouse


% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 99.0 %
Gravimetrically Reduced Subsample: 1.0%

% Non-Fibrous Material:
0.5 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822129
Client No.: 47-RR062819
Description: Black Tar
% Asbestos Detected:
None Detected


Facility:
Location: R1 At Parapet


% Non-Asbestos Fibrous Material:
2.9 SiAl, Other Fiber

Organic Fraction: 85.3 %
Gravimetrically Reduced Subsample: 14.7%

% Non-Fibrous Material:
11.8 Vanadium
Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822131
Client No.: 49-RR062819
Description: Grey Caulk
% Asbestos Detected:
None Detected

Facility:
Location: Penthouse Window


% Non-Asbestos Fibrous Material:
None Detected


Organic Fraction: 86.0 %
Gravimetrically Reduced Subsample: 14.0%

% Non-Fibrous Material:
14 Other

Insufficient material provided to verify results <100mg.

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822133
Client No.: 51-RR062819
Description: White Sealant
% Asbestos Detected:
None Detected

Facility:
Location: R1 At Chimney/Stack
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 86.3 %
Gravimetrically Reduced Subsample: 13.7%
% Non-Fibrous Material:
13.7 Other

Lab No.: 6822133(L2)
Client No.: 51-RR062819
Description: Grey Sealant
% Asbestos Detected:
None Detected

Facility:
Location: R1 At Chimney/Stack
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 93.6 %
Gravimetrically Reduced Subsample: 6.4%
% Non-Fibrous Material:
6.4 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature:
Analyst: Mark Stewart

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822135
Client No.: 53-RR062819
Description: Black Caulk
% Asbestos Detected:
None Detected


Facility:
Location: 1st Fl South Exterior Door

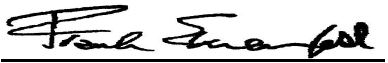
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 61.7 %
Gravimetrically Reduced Subsample: 38.3%

% Non-Fibrous Material:
38.3 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY

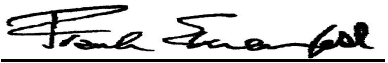
Lab No.: 6822137
Client No.: 55-RR062819
Description: Lt Grey Caulk
% Asbestos Detected:
None Detected

Facility:
Location: 1st Fl At Small 1'x4' Window Well (2)
Exterior North
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 92.4 %
Gravimetrically Reduced Subsample: 7.6%
% Non-Fibrous Material:
7.6 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822139
Client No.: 57-RR062819
Description: Tan Glazing
% Asbestos Detected:
None Detected

Facility:
Location: 1st Fl At Small 1'x4' Window (2) Exterior
North
% Non-Asbestos Fibrous Material:
Trace SiMg, Talc

Organic Fraction: 71.6 %
Gravimetrically Reduced Subsample: 28.4%
% Non-Fibrous Material:
28.4 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822141
Client No.: 59-RR062819
Description: Grey Caulk
% Asbestos Detected:
None Detected


Facility:
Location: 1st Fl Main Floor Exterior North

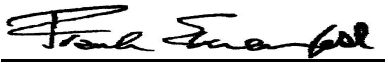
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 93.3 %
Gravimetrically Reduced Subsample: 6.7%

% Non-Fibrous Material:
6.7 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822145
Client No.: 63-RR062819
Description: Off-White Caulk
% Asbestos Detected:
None Detected

Facility:
Location: Basement Window (1) Exterior East
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 74.6 %
Gravimetrically Reduced Subsample: 25.4%
% Non-Fibrous Material:
25.4 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822147
Client No.: 65-RR062819
Description: Black Caulk
% Asbestos Detected:
None Detected

Facility:
Location: 1st Fl Window (15) Exterior West
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 47.7 %
Gravimetrically Reduced Subsample: 52.3%
% Non-Fibrous Material:
52.3 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY

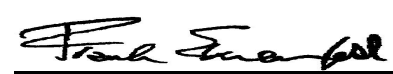
Lab No.: 6822149
Client No.: 67-RR062819
Description: Off-White Caulk
% Asbestos Detected:
1.7 Chrysotile

Facility:
Location: 1st Fl Window (15) Exterior West
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 65.9 %
Gravimetrically Reduced Subsample: 34.1%
% Non-Fibrous Material:
32.4 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

TEM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6822151
Client No.: 69-RR062819
Description: Grey Caulk
% Asbestos Detected:
None Detected


Facility:
Location: Door Exterior East


% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 83.5 %
Gravimetrically Reduced Subsample: 16.5%

% Non-Fibrous Material:
16.5 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB Rev #2, 7/22/2019
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351


TEM BULK SAMPLE ANALYSIS SUMMARY


Lab No.: 6822153
Client No.: 71-RR062819
Description: Grey Caulk
% Asbestos Detected:
None Detected

Facility:
Location: Exterior Stair South Facade
% Non-Asbestos Fibrous Material:
None Detected

Organic Fraction: 74.1 %
Gravimetrically Reduced Subsample: 25.9%
% Non-Fibrous Material:
25.9 Other

Please refer to the Preface of this report for further information regarding your analysis.

Date Received: 6/28/2019
Date Analyzed: 07/11/2019
Signature: 
Analyst: Mark Stewart

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

Appendix to Analytical Report:

Customer Contact: Bill Weisgarber
Analysis: ELAP Section 198.4

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager: wchampion@iatl.com
iATL Account Representative: Shirley Clark
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Bulk material, Non-Friable Organically Bound material such as VSF, FT, M, RM, Tar, CB, Shingle, Tar Paper, Caulk, Glazing
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis by ELAP Section 198.4

Certifications:

- NIST-NVLAP No. 101165-0
- NYSDOH-ELAP No. 11021
- AIHA-LAP, LLC No. 100188

All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.

The "Gravimetrically Reduced Subsample" is the portion of the submitted sample remaining following the ashing and acid treatment processes. TEM analysis occurs on this portion of the sample.

Final results are calculated to represent the sample as submitted. Results are verifiable for only those operations and analyses performed in the laboratory.

CERTIFICATE OF ANALYSIS

Client: USA Environmental Mgmt. Inc.
344 West State Street
Trenton NJ 08618

Report Date: 7/11/2019
Report No.: 593619 - TEM NOB
Project: Restoration Upgrades to Exterior Building
Envelope
Project No.: 19-020046-03

Client: USA351

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a complete list with highlighted disclaimers pertinent to this project. For a full explanation of these and other disclaimers, please inquire at customerservice@iatl.com.

- (1)Note: Sample not analyzed.
- (2)Note: Sample not analyzed at request of client.
- (3)Note: Sample analysis terminated. Clearance criteria exceeded (average >70.0 s/mm²). Set fails by AHERA 40 CFR 763.
- (4)Note: Heavy loading (>0.1 s/cc) of non-asbestos particulate that might prohibit the required morphological, diffraction and elemental identification of asbestos. The absence of asbestos on the sample can not be concluded. Analysis for informational purposes only.
- (5)Note: Heavy loading (>10% per grid opening) non-fibrous particulate. Sample analysis terminated. Clearance criteria exceeded (>10%). Sample voided by AHERA 40 CFR 763.
- (5A)Note: Heavy loading (>25% per grid opening) non-fibrous particulate. Sample analysis terminated. Clearance criteria exceeded (>25%). Sample voided by NIOSH 7402.
- (6)Note: Sample turbidity >1.0 NTU. Therefore MDL >> 0.1 MFL. Does not meet National Primary Drinking Water Standards.
- (7)Note: Sample integrity compromised. Received sample cassette with top open (40 CFR 763 c-e).
- (8)Note: Received sample cassettes with portion of filter missing. "PCM re-prep"
- (9)Note: Void - overloaded, unable to prep.
- (10)Note: Void - filter damaged.
- (11)Note: No volume supplied.
- (12)Note: Heavy loading (>0.1 s/cc) of non-asbestos / non-fibrous particulate.
- (13)Note: Method analytical sensitivity of <0.003 s/cc not attained due to volume of air sampled. NIOSH requires a minimum of 400L.
- (13A)Note: Volume does not meet AHERA requirements.(<1188 L)
- (14)Note: Geometric Mean = 0.xxxx Structures/cc
- (15)Note: Samples received on 0.8 micron PCM filters. Samples must be submitted on 0.45 micron filter cassettes per AHERA guidelines
- (18)Note: *Results are for informational purposes only. Samples received on 0.8um PCM cassettes. Per AHERA 40 CFR 763 guidelines samples must be obtained on a 0.45um cassette.
- (TEM NOB 1) Note: The above result represents only the analysis of NOB-residue submitted from the client.
- (TEM NOB 2) Note: Insufficient material (<100mg) to verify results.



USA Environmental Management, Inc.

344 West State Street
Trenton, New Jersey 08618

CLIENT: Lammy & Giorgio
PROJECT: Restoration Upgrades to Exterior Building Envelope
SITE: State Office Building

DATE: June 28 2019
TECHNICIAN: R. Reynolds
PROJECT #: 19-020046-03
DPMC #: M1531-00

TYPE OF ANALYSIS

- PLM, EPA/600/R-93/116
 Stop @ 1st Positive ID No.

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

SAMPLE ID	MATERIAL / (ID No.)	SAMPLE LOCATION	ADDITIONAL ANALYSIS
01	White Textured Finish Coat Plaster 6822075 (01)	4 th Fl. 431	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
01A	Grey Rough Coat Plaster 6822077 (02)	↓	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
02	6822078 (01)	419	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
02A	6822079 (02)	↓	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
03	6822080 (01)	3 rd Fl. 330	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
03A	6822081 (02)	↓	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
04	6822082 (01)	311	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
04A	6822083 (02)	↓	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
05	6822084 (01)	2 nd Fl. 209	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
05A	6822085 (02)	↓	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
06	6822086 (01)	1 st Fl. 102	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
06A	6822087 (02)	↓	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)

TURN-AROUND-TIME	
<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 3 Days
<input type="checkbox"/> 1 Day	<input type="checkbox"/> TEM, 2 Days
<input checked="" type="checkbox"/> 2 Days	<input type="checkbox"/> TEM, 3 Days

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
I. <i>R. Reynolds</i>	6/28/19		I. <i>J. H. [unclear]</i>	6/28/19	2:30p.
II.			II.		
III.			III.		

COMMENTS: _____

JUN 28 2019

(A) J. Lowe 7-1-19

(1)



USA Environmental Management, Inc.

344 West State Street
Trenton, New Jersey 08618

CLIENT: Lammey & Giorgio
PROJECT: Restoration Upgrades to Exterior Building Envelope
SITE: State Office Building

DATE: June 28, 2019
TECHNICIAN: R. Reynolds
PROJECT #: 19-020046-03
DPMC #: M1531-00

TYPE OF ANALYSIS
 PLM, EPA/600/R-93/116
 Stop @ 1st Positive ID No.

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

SAMPLE ID	MATERIAL / (ID No.)	SAMPLE LOCATION	ADDITIONAL ANALYSIS
07 RR062819	5822083(01)	Basement 8, Lib. room	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
07A	5822083(02)	↓	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
08	Gypsum Paper Drywall + Assor. Joint Compound 5822088(03)	3rd Fl. 312	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
09	↓ 5822091(03)	2nd Fl. 229	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
10	Brown Interior Window Caulk @ Metal Casing to Wall Interface (04)	1st Fl. 107	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
11	↓ 5822092(04)	3rd F 306	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
12	White Interior Window Caulk @ Wood Casing/Trim to Wall Interface (05)	1st Fl. 102	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
13	↓ 5822093(05)	3rd Fl. 306	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
14	Rock Field w/ Stone Ballast (Type 1) 5822094(06)	R1	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
15	↓ 5822094(06)	R1	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
16	Felt on JOS Board Under ID No. 06 5822095(07)	R1	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
17	↓ 5822095(07)	R1	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)

TURN-AROUND-TIME	
<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 3 Days
<input type="checkbox"/> 1 Day	<input type="checkbox"/> TEM, 2 Days
<input checked="" type="checkbox"/> 2 Days	<input checked="" type="checkbox"/> TEM, 3 Days

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
I. Richard J. Reynolds	6/28/19		I. J. Herb	6/28/19	2:30 PM
II.			II.		
III.			III.		

COMMENTS: Paul A. [Signature] 7/2/19

(2)



USA Environmental Management, Inc.

344 West State Street
Trenton, New Jersey 08618

CLIENT: Lammey & Giorgio
PROJECT: Restoration Upgrades to Exterior Building Envelope
SITE: State Office Building

DATE: June 28, 2019
TECHNICIAN: B Reynolds
PROJECT #: 19-020046-03
DPMC #: M1531-00

TYPE OF ANALYSIS
 PLM, EPA/600/R-93/116
 Stop @ 1st Positive ID No.

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

SAMPLE ID	MATERIAL / (ID No.)	SAMPLE LOCATION	ADDITIONAL ANALYSIS
18 RR062819	Tar/Asphalt on Concrete Roof Deck Under TD No. 06 (08)	R1 6822100	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
19	↓ (Type 1) (08)	R1 6822100	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
20	Grey Mineral Coat Flashing @ Parapet, curbs (Type 1) (09)	R1 6822100	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
21	↓ (09)	R1 6822100	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
22	Tar/Asphalt on Parapet and Curbs Under TD No. 09 (10)	R1 6822100	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
23	↓ (Type 1) (10)	R1 6822100	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
24	Tar Coating @ Coping Seams (11)	R1 6822100	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
25	↓ (11)	R1 6822100	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
26	Tar/Asphalt @ Pitch Rockets (12)	R1 6822100	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
27	↓ (12)	R1 6822100	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
28	Whole Ext. Lower Caulk (13)	Penthouse Ext 6822110	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
29	↓ (13)	Penthouse 6822110	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)

TURN-AROUND-TIME	
<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 3 Days
<input type="checkbox"/> 1 Day	<input type="checkbox"/> TEM, 2 Days
<input checked="" type="checkbox"/> 2 Days	<input checked="" type="checkbox"/> TEM, 3 Days

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
I. <i>B Reynolds</i>	6/28/19		I.		
II.			II.		
III.			III.		

COMMENTS: _____

(3)



USA Environmental Management, Inc.

344 West State Street
Trenton, New Jersey 08618

CLIENT: Lammey & Giorgio
PROJECT: Restoration Upgrades to Exterior Building Envelope
SITE: State Office Building

DATE: June 28 2019
TECHNICIAN: R. Reynolds
PROJECT #: 19-020046-03
DPMC #: M1531-00

TYPE OF ANALYSIS
 PLM, EPA/600/R-93/116
 Stop @ 1st Positive ID No.

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

SAMPLE ID	MATERIAL / (ID No.)	SAMPLE LOCATION	ADDITIONAL ANALYSIS
30	White Exterior Window Glazing - Penthouse (14)	Penthouse Exterior 8822112	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
31	↓ (14)	↓ 8822113	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
32	Tar @ Seams at Copper Penthouse Walls (15)	Penthouse Wall Ext. 8822114	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
33	↓ (15)	↓ 8822115	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
34	Clear Glazing Assoc. with Door Windows (16)	Penthouse Door 8822116	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
35	↓ (16)	↓ 8822117	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
36	White Sealant @ Ext. Electrical Conduit Penetrations (17)	Penthouse Ext. Wall 8822118	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
37	↓ (17)	↓ 8822119	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
38	Roof Field w/ Stone Ballast (Type 2) (18)	R2 - Penthouse 8822120	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
39	↓ (18)	↓ 8822121	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
40	Tar/Asphalt on Concrete Roof Deck Under IP No. 13 (Type 2) (19)	8822122	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
41	↓ (19)	↓ 8822123	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)

TURN-AROUND-TIME	
<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 3 Days
<input type="checkbox"/> 1 Day	<input type="checkbox"/> TEM, 2 Days
<input checked="" type="checkbox"/> 2 Days	<input checked="" type="checkbox"/> TEM, 3 Days

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
I. <i>R. Reynolds</i>	6/28/19		I.		
II.			II.		
III.			III.		

COMMENTS:

(A)
[Signature]
7/2/19
(4)



USA Environmental Management, Inc.

344 West State Street
Trenton, New Jersey 08618

CLIENT: Lammey & Giorgio
PROJECT: Restoration Upgrades to Exterior Building Envelope
SITE: State Office Building

DATE: June 28, 2019
TECHNICIAN: R. Reynolds
PROJECT #: 19-020046-03
DPMC #: M1531-00

TYPE OF ANALYSIS
 PLM, EPA/600/R-93/116
 Stop @ 1st Positive ID No.

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

SAMPLE ID	MATERIAL / (ID No.)	SAMPLE LOCATION	ADDITIONAL ANALYSIS
42	Grey Mineral Coat Flashing @ Parapet (Type 2) (20)	P2 Penthouse	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
43	↓ (20)		<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
44	Tar/Asphalt on Parapet Under ID No. 20 (Type 2) (21)		<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
45	↓ (21)		<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
46	Tar/Asphalt @ Seams of Flashings ID No. 09 & 20 (22)		<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
47	↓ (22)	P1 @ Parapet	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
48	Grey Exterior Window Caulk @ Penthouse (23)	Penthouse (Window)	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
49	↓ (23)		<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
50	Grey Tar Coating @ chimney/Stack (24)	R1 @ chimney/Stack	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
51	↓ (24)		<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
52	Brown Ext Door Caulk (25)	East Ext Door Basement	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
53	↓ (25)	bt Fl. South Ext Door	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)

TURN-AROUND-TIME	
<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 3 Days
<input type="checkbox"/> 1 Day	<input type="checkbox"/> TEM, 2 Days
<input checked="" type="checkbox"/> 2 Days	<input checked="" type="checkbox"/> TEM, 3 Days

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
I. <i>R. Reynolds</i>	6/28/19		I.		
II.			II.		
III.			III.		

COMMENTS:

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(5)



USA Environmental Management, Inc.

344 West State Street
Trenton, New Jersey 08618

CLIENT: Lammey & Giorgio
PROJECT: Restoration Upgrades to Exterior Building Envelope
SITE: State Office Building

DATE: June 28, 2019
TECHNICIAN: R. Reynolds
PROJECT #: 19-020046-03
DPMC #: M1531-00

TYPE OF ANALYSIS
 PLM, EPA/600/R-93/116
 Stop @ 1st Positive ID No.

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

SAMPLE ID	MATERIAL / (ID No.)	SAMPLE LOCATION	ADDITIONAL ANALYSIS
54	Light Grey Window Caulk @ Exterior (26)	2 nd Fl., e Small 1/24" window (1) Ext. North	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
55	↓ (26)	↓ 6022137 (2)	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
56	Grey Ext. Window Glazing (27)	1 st Fl., e Small 1/24" window Ext. North 6022138	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
57	↓ (27)	↓ 6022139 (2)	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
58	Grey Ext. Door Caulk (28)	1 st Fl., Main Door Ext. North 6022140	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
59	↓ (28)	↓ 6022141	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
60	Black Tar Coating Over Ext Window Well (29)	Basement Window Well Ext. West 6022142	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
61	↓ (29)	Basement Window Well Ext. East (4)	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
62	Caulk @ Exterior Window Well Grab Cover (30)	Basement Window Well (1) Ext. West 6022143	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
63	↓ (30)	↓ 6022144	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
64	Brown Ext. Window Caulk @ Metal casing to Brick (31)	3 rd Fl. Window (1) Ext. West 6022145	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
65	↓ (31)	1 st Fl., Window (15) Ext. East 6022147	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)

TURN-AROUND-TIME	
<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 3 Days
<input type="checkbox"/> 1 Day	<input type="checkbox"/> TEM, 2 Days
<input checked="" type="checkbox"/> 2 Days	<input checked="" type="checkbox"/> TEM, 3 Days

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
I. <i>Richard Reynolds</i>	6/28/19		I.		
II. <i>[Signature]</i>	7/2/19		II.		
III.			III.		

COMMENTS: _____

6



USA Environmental Management, Inc.

344 West State Street
Trenton, New Jersey 08618

CLIENT: Lammey & Giorgio
PROJECT: Restoration Upgrades to Exterior Building Envelope
SITE: State Office Building

DATE: June 28, 2019
TECHNICIAN: R Reynolds
PROJECT #: 19-020046-03
DPMC #: M1531-00

TYPE OF ANALYSIS
 PLM, EPA/600/R-93/116
 Stop @ 1st Positive ID No.

BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

SAMPLE ID	MATERIAL / (ID No.)	SAMPLE LOCATION	ADDITIONAL ANALYSIS
66	White Ext. Window Caulk (Under Metal) @ Wood Trim to Brick (32)	3rd Fl., Window (1) Ext West 002214	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
67	(32)	1st Fl., Window (5) Ext East 002214	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
68	White Ext. Door Caulk Remnants (33)	Door Ext West 002215	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
69	(33)	(33)	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
70	White Sealant at Seams/Cracks of Concrete Exterior Stairs (34)	Exterior Stair North Facade 002215	<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
71	(34)	Exterior Stair South Facade 002215	<input checked="" type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
	()		<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
	()		<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
	()		<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
	()		<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
	()		<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)
	()		<input type="checkbox"/> TEM EPA NOB (if ND or <1% by PLM)

TURN-AROUND-TIME	
<input type="checkbox"/> 6 Hours	<input type="checkbox"/> 3 Days
<input type="checkbox"/> 1 Day	<input type="checkbox"/> TEM, 2 Days
<input checked="" type="checkbox"/> 2 Days	<input checked="" type="checkbox"/> TEM, 3 Days

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
I. <i>R Reynolds</i>	6/28/19		I.		
II.			II.		
III.			III.		

COMMENTS: _____

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APPENDIX B

XRF Field Survey Data
XRF Performance Characteristic Sheet



Client: Lammey & Giorgio

Date: 6/28/2019

Project #: 19-020046-03

DPMC #: M1531-00

Inspector: R. Reynolds

Facility: State Office Building

Inspector ID #: 29956

Project: Restoration Upgrades to Exterior Building Envelope

XRF Serial #: 25389

Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
1	Calibration A	-	-	-	-	1.00	-	-
2	Calibration B	-	-	-	-	1.00	-	-
3	Calibration C	-	-	-	-	1.00	-	-
4	112	A	Wood	Window Sill	Intact	0.00	Negative	Negative
5	112	A	Drywall	Wall	Intact	0.00	Negative	Negative
6	112	A	Metal	Window Casing	Intact	0.00	Negative	Negative
7	112	B	Plaster	Wall	Intact	9.9	Positive	Positive
8	112	C	Drywall	Wall	Intact	0.00	Negative	Negative
9	112	D	Drywall	Wall	Intact	0.00	Negative	Negative
10	112	D	Wood	Window Sill (1)	Intact	0.00	Negative	Negative
11	112	D	Metal	Window Casing (1)	Intact	0.00	Negative	Negative
12	112	D	Metal	Window Sash (1)	Intact	0.00	Negative	Negative
13	100	A	Metal	Window Sill (2)	Intact	0.00	Negative	Negative
14	100	A	Metal	Window Casing (2)	Intact	0.00	Negative	Negative
15	100	A	Metal	Window Sash (2)	Intact	0.00	Negative	Negative
16	100	B	Wood	Window Sill (1)	Intact	0.00	Negative	Negative
17	100	B	Metal	Window Casing (1)	Intact	0.00	Negative	Negative
18	100	B	Metal	Window Sash (1)	Intact	0.00	Negative	Negative
19	100	B	Plaster	Wall	Intact	19.9	Positive	Positive
20	102	B	Wood	Window Casing (7)	Intact	0.11	Negative	Positive
21	102	B	Wood	Window Trim	Intact	0.14	Negative	Positive
22	Penthouse Exterior	D	Metal	Louver	Poor	0.60	Negative	Positive
23	Penthouse Exterior	C	Wood	Louver	Poor	2.6	Positive	Positive



Client: Lammey & Giorgio

Date: 6/28/2019

Project #: 19-020046-03

DPMC #: M1531-00

Inspector: R. Reynolds

Facility: State Office Building

Inspector ID #: 29956

Project: Restoration Upgrades to Exterior Building Envelope

XRF Serial #: 25389

Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
24	Penthouse Exterior	D	Metal	Window Sash	Poor	8.5	Positive	Positive
25	Penthouse Exterior	A	Metal	Electrical Box	Intact	0.06	Negative	Positive
26	Penthouse Exterior	A	Metal	Wall	Poor	0.00	Negative	Negative
27	Penthouse Exterior	B	Metal	Wall	Poor	0.00	Negative	Negative
28	Penthouse Exterior	C	Metal	Wall	Poor	0.00	Negative	Negative
29	Penthouse Exterior	D	Metal	Wall	Poor	0.00	Negative	Negative
30	Penthouse Exterior	B	Metal	Window Sash	Poor	7.3	Positive	Positive
31	Penthouse Exterior	B	Metal	A/C Unit	Intact	0.00	Negative	Negative
32	Penthouse Exterior	B	Wood	Panel Above A/C Unit	Intact	0.10	Negative	Positive
33	Penthouse Exterior	B	Metal	Door	Intact	7.0	Positive	Positive
34	R1	N/A	Metal	Vent	Intact	28.5	Positive	Positive
35	R1	N/A	Metal	Ladder	Intact	0.00	Negative	Negative
36	501	N/A	Metal	I-Beam	Intact	0.11	Negative	Positive
37	501	B	Metal	Radiator	Poor	4.6	Positive	Positive
38	501	N/A	Concrete	Floor	Intact	1.6	Positive	Positive
39	501	B	Metal	Door Buck	Poor	10.1	Positive	Positive
40	501	N/A	Concrete	Ceiling	Intact	0.30	Negative	Positive
41	501	C	Wood	Louver Frame	Poor	12.4	Positive	Positive
42	501	D	Wood	Louver Frame	Poor	8.0	Positive	Positive
43	S1	C	Metal	Door	Intact	0.00	Negative	Negative
44	S1	C	Metal	Door Buck	Intact	0.00	Negative	Negative
45	S1	A	Plaster	Wall	Intact	0.30	Negative	Positive
46	S1	C	Plaster	Wall	Intact	0.26	Negative	Positive



Client: Lammey & Giorgio

Date: 6/28/2019

Project #: 19-020046-03

DPMC #: M1531-00

Inspector: R. Reynolds

Facility: State Office Building

Inspector ID #: 29956

Project: Restoration Upgrades to Exterior Building Envelope

XRF Serial #: 25389

Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
47	502	A	Drywall	Wall	Intact	0.00	Negative	Negative
48	502	B	Drywall	Wall	Intact	0.00	Negative	Negative
49	502	C	Drywall	Wall	Intact	0.00	Negative	Negative
50	502	D	Drywall	Wall	Intact	0.00	Negative	Negative
51	502	B	Wood	Insert at Door	Intact	0.00	Negative	Negative
52	502	D	Wood	Window Frame (1)	Intact	5.3	Positive	Positive
53	417	B	Brick	Window Sill (2)	Intact	0.02	Negative	Positive
54	417	B	Plaster	Wall	Intact	13.1	Positive	Positive
55	417	B	Wood	Window Sill (2)	Intact	0.00	Negative	Negative
56	417	B	Metal	Window Casing (2)	Intact	0.00	Negative	Negative
57	417	B	Metal	Window Sash (2)	Intact	0.00	Negative	Negative
58	405	D	Brick	Window Sill (2)	Intact	0.00	Negative	Negative
59	405	D	Plaster	Wall	Intact	8.5	Positive	Positive
60	405	D	Wood	Window Sill (2)	Intact	0.00	Negative	Negative
61	405	D	Metal	Window Casing (2)	Intact	0.00	Negative	Negative
62	405	D	Metal	Window Sash (2)	Intact	0.00	Negative	Negative
63	405	A	Drywall	Wall	Intact	0.00	Negative	Negative
64	331	D	Wood	Window Sill	Intact	0.00	Negative	Negative
65	331	D	Metal	Window Casing	Intact	0.00	Negative	Negative
66	331	D	Metal	Window Sash	Intact	0.00	Negative	Negative
67	331	A	Drywall	Wall	Intact	0.00	Negative	Negative
68	331	D	Plaster	Wall	Intact	13.2	Positive	Positive
69	315	B	Wood	Window Sill	Intact	0.00	Negative	Negative



Client: Lammey & Giorgio

Date: 6/28/2019

Project #: 19-020046-03

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Inspector: R. Reynolds

Facility: State Office Building

Inspector ID #: 29956

Project: Restoration Upgrades to Exterior Building Envelope

XRF Serial #: 25389

Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
70	315	B	Metal	Window Casing	Intact	0.00	Negative	Negative
71	315	B	Metal	Window Sash	Intact	0.00	Negative	Negative
72	315	C	Drywall	Wall	Intact	0.00	Negative	Negative
73	212	B	Wood	Window Sill	Intact	0.00	Negative	Negative
74	212	B	Metal	Window Casing	Intact	0.00	Negative	Negative
75	212	B	Metal	Window Sash	Intact	0.00	Negative	Negative
76	212	A	Drywall	Wall	Intact	0.00	Negative	Negative
77	212	B	Plaster	Wall	Intact	13.2	Positive	Positive
78	231	D	Wood	Window Sill	Intact	0.00	Negative	Negative
79	231	D	Metal	Window Casing	Intact	0.00	Negative	Negative
80	231	D	Metal	Window Sash	Intact	0.00	Negative	Negative
81	231	D	Plaster	Wall	Intact	11.2	Positive	Positive
82	B08	C	Drywall	Wall	Intact	2.7	Positive	Positive
83	B09	C	Wood	Window Sill (2)	Intact	0.00	Negative	Negative
84	B10	C	Metal	Window Casing (2)	Intact	0.00	Negative	Negative
85	B11	C	Metal	Window Sash (2)	Intact	0.00	Negative	Negative
86	B03	B	Plaster	Wall	Intact	13.2	Positive	Positive
87	B04	B	Brick	Window Sill	Intact	0.00	Negative	Negative
88	B05	B	Plaster	Wall	Intact	8.9	Positive	Positive
89	B06	N/A	Metal	Duct	Intact	0.00	Negative	Negative
90	B07	A	Wood	Wall	Intact	0.00	Negative	Negative
91	Exterior 1st Floor	A	Wood	Door	Intact	0.11	Negative	Positive
92	Exterior 1st Floor	A	Wood	Door Casing	Intact	0.08	Negative	Positive



Client: Lammey & Giorgio

Date: 6/28/2019

Project #: 19-020046-03

DPMC #: M1531-00

Inspector: R. Reynolds

Facility: State Office Building

Inspector ID #: 29956

Project: Restoration Upgrades to Exterior Building Envelope

XRF Serial #: 25389

Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
93	Exterior 1st Floor	A	Metal	Window Casing (4)	Intact	0.00	Negative	Negative
94	Exterior 1st Floor	A	Metal	Window Sash (4)	Intact	0.00	Negative	Negative
95	Exterior Basement	A	Metal	Bars at Windows	Intact	7.6	Positive	Positive
96	Exterior 1st Floor	A	Wood	Small Window (2)	Intact	22.6	Positive	Positive
97	Exterior 1st Floor	A	Wood	Small Window Trim (2)	Intact	24.2	Positive	Positive
98	Exterior Basement	B	Metal	Window Casing (6)	Intact	0.00	Negative	Negative
99	Exterior Basement	B	Metal	Window Sash (6)	Intact	0.00	Negative	Negative
100	Exterior Basement	B	Metal	Bars at Windows	Intact	6.6	Positive	Positive
101	Exterior Stair	B	Metal	Stair Tower Column	Intact	0.00	Negative	Negative
102	Exterior Stair	B	Metal	Stringer	Intact	0.00	Negative	Negative
103	Exterior Stair	B	Metal	Hand Rail	Intact	0.21	Negative	Positive
104	Exterior Stair	B	Metal	Stair Tread	Intact	0.02	Negative	Positive
105	Exterior Basement	B	Metal	Door	Intact	0.00	Negative	Negative
106	Exterior Basement	B	Metal	Door Frame	Intact	0.00	Negative	Negative
107	Exterior 1st Floor	C	Metal	Door	Intact	0.00	Negative	Negative
108	Exterior 1st Floor	C	Metal	Door Frame	Intact	0.00	Negative	Negative
109	Exterior 1st Floor	C	Metal	Lamp Mounting Bracket (1)	Intact	2.4	Positive	Positive
110	Exterior 1st Floor	C	Metal	Lamp (1)	Intact	0.60	Negative	Positive
111	Exterior 1st Floor	C	Metal	Lamp Mounting Bracket (2)	Intact	2.4	Positive	Positive
112	Exterior 1st Floor	C	Metal	Lamp (2)	Intact	0.80	Negative	Positive
113	Exterior 1st Floor	C	Metal	Window Casing (2)	Intact	0.00	Negative	Negative
114	Exterior 1st Floor	C	Metal	Window Sash (2)	Intact	0.00	Negative	Negative
115	Exterior 1st Floor	D	Metal	Window Casing (16)	Intact	0.00	Negative	Negative



Client: Lammey & Giorgio

Date: 6/28/2019

Project #: 19-020046-03

DPMC #: M1531-00

Inspector: R. Reynolds

Facility: State Office Building

Inspector ID #: 29956

Project: Restoration Upgrades to Exterior Building Envelope

XRF Serial #: 25389

Test No.	Room/Location	Wall	Substrate	Component	Condition	Lead (mg/cm ²)	EPA/HUD	OSHA
116	Exterior 1st Floor	D	Metal	Window Sash (16)	Intact	0.00	Negative	Negative
117	Exterior 1st Floor	D	Metal	Guard Rail	Intact	0.17	Negative	Positive
118	Exterior 1st Floor	D	Metal	Catwalk Support Beam	Intact	0.00	Negative	Negative
119	Exterior 1st Floor	D	Metal	Catwalk Hand Rail	Intact	0.00	Negative	Negative
120	Exterior 1st Floor	D	Metal	Catwalk Stringer	Intact	0.00	Negative	Negative
121	Exterior 1st Floor	D	Metal	Catwalk Stair Tread	Intact	0.00	Negative	Negative
122	Exterior 1st Floor	D	Metal	Grated Walkway	Intact	0.00	Negative	Negative
123	Exterior Basement	D	Metal	Window Casing (9)	Intact	0.00	Negative	Negative
124	Exterior Basement	D	Metal	Window Sash (9)	Intact	0.00	Negative	Negative
125	Exterior Basement	D	Brick	Window Sill (9)	Intact	0.03	Negative	Positive
126	Exterior Basement	D	Concrete	Window Sill (9)	Intact	0.13	Negative	Positive
127	Exterior Basement	D	Metal	Hand Rail	Intact	0.00	Negative	Negative
128	Exterior Basement	D	Metal	Stringer	Intact	0.09	Negative	Positive
129	Exterior Basement	D	Metal	Stair Tread	Intact	0.12	Negative	Positive
130	Exterior Basement	D	Metal	Door	Intact	0.00	Negative	Negative
131	Exterior Basement	D	Metal	Door Frame	Intact	0.00	Negative	Negative
132	Exterior Basement	D	Metal	Window Grate (10)	Intact	6.90	Positive	Positive
133	Exterior 1st Floor	D	Metal	Overhang Column	Intact	0.00	Negative	Negative
134	Exterior 1st Floor	D	Metal	Overhang I-Beam	Intact	0.05	Negative	Positive
135	Exterior 1st Floor	D	Metal	Overhang Ceiling Deck	Intact	0.00	Negative	Negative
136	Calibration D	-	-	-	-	1.1	-	-
137	Calibration E	-	-	-	-	1.1	-	-
138	Calibration F	-	-	-	-	1.00	-	-

Performance Characteristic Sheet

EFFECTIVE DATE: September 24, 2004

EDITION NO.: 1

MANUFACTURER AND MODEL:

Make: Niton LLC

Tested Model: XLp 300

Source: ^{109}Cd

Note: This PCS is also applicable to the equivalent model variations indicated below, for the Lead-in-Paint K+L variable reading time mode, in the XLi and XLp series:

XLi 300A, XLi 301A, XLi 302A and XLi 303A.

XLp 300A, XLp 301A, XLp 302A and XLp 303A.

XLi 700A, XLi 701A, XLi 702A and XLi 703A.

XLp 700A, XLp 701A, XLp 702A, and XLp 703A.

Note: The XLi and XLp versions refer to the shape of the handle part of the instrument. The differences in the model numbers reflect other modes available, in addition to Lead-in-Paint modes. The manufacturer states that specifications for these instruments are identical for the source, detector, and detector electronics relative to the Lead-in-Paint mode.

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Lead-in-Paint K+L variable reading time mode.

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm ² (inclusive)

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm² in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm² film).

If readings are outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instruments into control before XRF testing proceeds.

SUBSTRATE CORRECTION:

For XRF results using Lead-in-Paint K+L variable reading time mode, substrate correction is not needed for:

Brick, Concrete, Drywall, Metal, Plaster, and Wood

INCONCLUSIVE RANGE OR THRESHOLD:

K+L MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm ²)
Results not corrected for substrate bias on any substrate	Brick	1.0
	Concrete	1.0
	Drywall	1.0
	Metal	1.0
	Plaster	1.0
	Wood	1.0

BACKGROUND INFORMATION

EVALUATION DATA SOURCE AND DATE:

This sheet is supplemental information to be used in conjunction with Chapter 7 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* ("HUD Guidelines"). Performance parameters shown on this sheet are calculated from the EPA/HUD evaluation using archived building components. Testing was conducted in August 2004 on 133 testing combinations. The instruments that were used to perform the testing had new sources; one instrument's was installed in November 2003 with 40 mCi initial strength, and the other's was installed June 2004 with 40 mCi initial strength.

OPERATING PARAMETERS:

Performance parameters shown in this sheet are applicable only when properly operating the instrument using the manufacturer's instructions and procedures described in Chapter 7 of the HUD Guidelines.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Substrate correction is not needed for brick, concrete, drywall, metal, plaster or wood when using Lead-in-Paint K+L variable reading time mode, the normal operating mode for these instruments. If substrate correction is desired, refer to Chapter 7 of the HUD Guidelines for guidance on correcting XRF results for substrate bias.

EVALUATING THE QUALITY OF XRF TESTING:

Randomly select ten testing combinations for retesting from each house or from two randomly selected units in multifamily housing. Use the K+L variable time mode readings.

Conduct XRF retesting at the ten testing combinations selected for retesting.

Determine if the XRF testing in the units or house passed or failed the test by applying the steps below.

Compute the Retest Tolerance Limit by the following steps:

Determine XRF results for the original and retest XRF readings. Do not correct the original or retest results for substrate bias. In single-family housing a result is defined as the average of three readings. In multifamily housing, a result is a single reading. Therefore, there will be ten original and ten retest XRF results for each house or for the two selected units.

Calculate the average of the original XRF result and retest XRF result for each testing combination.

Square the average for each testing combination.

Add the ten squared averages together. Call this quantity C.

Multiply the number C by 0.0072. Call this quantity D.

Add the number 0.032 to D. Call this quantity E.

Take the square root of E. Call this quantity F.

Multiply F by 1.645. The result is the Retest Tolerance Limit.

Compute the average of all ten original XRF results.

Compute the average of all ten re-test XRF results.

Find the absolute difference of the two averages.

If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, this procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection should be considered deficient.

Use of this procedure is estimated to produce a spurious result approximately 1% of the time. That is, results of this procedure will call for further examination when no examination is warranted in approximately 1 out of 100 dwelling units tested.

TESTING TIMES:

For the Lead-in-Paint K+L variable reading time mode, the instrument continues to read until it is moved away from the testing surface, terminated by the user, or the instrument software indicates the reading is complete. The following table provides testing time information for this testing mode. The times have been adjusted for source decay, normalized to the initial source strengths as noted above. Source strength and type of substrate will affect actual testing times. At the time of testing, the instruments had source strengths of 26.6 and 36.6 mCi.

Testing Times Using K+L Reading Mode (Seconds)						
Substrate	All Data			Median for laboratory-measured lead levels (mg/cm ²)		
	25 th Percentile	Median	75 th Percentile	Pb < 0.25	0.25 ≤ Pb < 1.0	1.0 ≤ Pb
Wood Drywall	4	11	19	11	15	11
Metal	4	12	18	9	12	14
Brick Concrete Plaster	8	16	22	15	18	16

CLASSIFICATION RESULTS:

XRF results are classified as positive if they are greater than or equal to the threshold, and negative if they are less than the threshold.

DOCUMENTATION:

A document titled *Methodology for XRF Performance Characteristic Sheets* provides an explanation of the statistical methodology used to construct the data in the sheets, and provides empirical results from using the recommended inconclusive ranges or thresholds for specific XRF instruments. For a copy of this document call the National Lead Information Center Clearinghouse at 1-800-424-LEAD.

This XRF Performance Characteristic Sheet was developed by the Midwest Research Institute (MRI) and QuanTech, Inc., under a contract between MRI and the XRF manufacturer. HUD has determined that the information provided here is acceptable when used as guidance in conjunction with Chapter 7, Lead-Based Paint Inspection, of HUD's *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*.

APPENDIX C

*PCB Certificates of Analysis
PCB Chain of Custody Records*



EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn:

**R Reynolds
USA Environmental Management, Inc.
344 West State Street
Trenton, NJ 08618**

Phone: (609) 656-8101

Fax:

7/12/2019

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 6/28/2019. The results are tabulated on the attached data pages for the following client designated project:

**Restoration Upgrades to ext. bldg envelope state office building
135w. hanover trenton NJ 19-020046-03**

The reference number for these samples is EMSL Order #011908046. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Approved By:

Phillip Worby, Environmental Chemistry
Laboratory Director



The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, CA ELAP 1877

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 858-4571

<http://www.EMSL.com>EnvChemistry2@emsl.com

EMSL Order: 011908046

CustomerID: USA53

CustomerPO:

ProjectID:

Attn: **R Reynolds**
USA Environmental Management, Inc.
344 West State Street
Trenton, NJ 08618

Phone: (609) 656-8101
 Fax:
 Received: 06/28/19 2:45 PM

Project: Restoration Upgrades to ext. bldg envelope state office building 135w. hanover trenton NJ 19-020046-03

Analytical Results

Client Sample Description 01PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0001
 Brown caulk at metal casing sewing white caulk @ wood trim seams (original)

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1221	ND D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1232	ND D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1242	ND D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1248	ND D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1254	21 D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1260	ND D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1262	ND D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1268	ND D		0.95 mg/Kg	7/3/2019 AF	07/03/19 0:00 EH

Client Sample Description 02PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0002
 White exterior wood louver seams-penthouse

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1221	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1232	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1242	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1248	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1254	0.99 D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1260	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1262	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1268	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH

Client Sample Description 03PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0003
 Exterior electrical conduit penetrations

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D		0.89 mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1221	ND D		0.89 mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1232	ND D		0.89 mg/Kg	7/2/2019 AF	07/03/19 0:00 EH

**EMSL Analytical, Inc.**

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Phone: (609) 656-8101
 Fax:
 Received: 06/28/19 2:45 PM

Project: **Restoration Upgrades to ext. bldg envelope state office building 135w. hanover trenton NJ 19-020046-03**

Analytical Results

Client Sample Description 03PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0003
 Exterior electrical conduit penetrations

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1242	ND D	0.89	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1248	ND D	0.89	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1254	ND D	0.89	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1260	ND D	0.89	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1262	ND D	0.89	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1268	ND D	0.89	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH

Client Sample Description 041PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0004
 Exterior windows frame to metal wall interface-penthouse

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1221	ND D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1232	ND D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1242	ND D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1248	ND D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1254	2.0 D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1260	ND D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1262	ND D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1268	ND D	0.86	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH

Client Sample Description 05PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0005
 Brown metal door seams white basement door remnants

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D	0.72	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1221	ND D	0.72	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1232	ND D	0.72	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1242	ND D	0.72	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1248	ND D	0.72	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1254	ND D	0.72	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH

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 Fax:
 Received: 06/28/19 2:45 PM

Project: **Restoration Upgrades to ext. bldg envelope state office building 135w. hanover trenton NJ 19-020046-03**

Analytical Results

Client Sample Description 05PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0005
 Brown metal door seams white basement door remnants

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1260	ND D		0.72 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1262	ND D		0.72 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1268	ND D		0.72 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH

Client Sample Description 06PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0006
 Small 1X4 windows @ front north façade-1st fl

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1221	ND D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1232	ND D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1242	ND D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1248	ND D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1254	ND D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1260	0.82 D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1262	ND D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1268	ND D		0.71 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH

Client Sample Description 07PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0007
 Front door north façade

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1221	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1232	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1242	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1248	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1254	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1260	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1262	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1268	ND D		0.95 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (856) 303-2500 / (856) 858-4571

<http://www.EMSL.com>EnvChemistry2@emsl.com

EMSL Order: 011908046

CustomerID: USA53

CustomerPO:

ProjectID:

Attn: **R Reynolds**
USA Environmental Management, Inc.
344 West State Street
Trenton, NJ 08618

Phone: (609) 656-8101
 Fax:
 Received: 06/28/19 2:45 PM

Project: Restoration Upgrades to ext. bldg envelope state office building 135w. hanover trenton NJ 19-020046-03

Analytical Results

Client Sample Description 08PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0008
 Exterior window well grate corner-basement

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1221	ND D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1232	ND D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1242	ND D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1248	ND D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1254	15000 D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1260	27000 D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1262	ND D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1268	ND D	2400	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH

Client Sample Description 09PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0009
 brown ext. window caulk @ aluminum casing seams white original window caulk @ wood trim under alun.

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1221	ND D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1232	ND D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1242	ND D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1248	ND D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1254	1.4 D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1260	1.0 D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1262	ND D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH
3546/8082A	Aroclor-1268	ND D	0.99	mg/Kg	7/2/2019 AF	07/03/19 0:00 EH

Client Sample Description 10PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0010
 South concrete stair seams/cracks

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1016	ND D	0.98	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1221	ND D	0.98	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1232	ND D	0.98	mg/Kg	7/2/2019 AF	07/02/19 0:00 EH

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077
 Phone/Fax: (856) 303-2500 / (856) 858-4571
<http://www.EMSL.com> EnvChemistry2@emsl.com

EMSL Order: 011908046
 CustomerID: USA53
 CustomerPO:
 ProjectID:

Attn: **R Reynolds**
USA Environmental Management, Inc.
344 West State Street
Trenton, NJ 08618

Phone: (609) 656-8101
 Fax:
 Received: 06/28/19 2:45 PM

Project: **Restoration Upgrades to ext. bldg envelope state office building 135w. hanover trenton NJ 19-020046-03**

Analytical Results

Client Sample Description 10PCB062819 **Collected:** 6/28/2019 **Lab ID:** 011908046-0010
 South concrete stair seams/cracks

Method	Parameter	Result	RL	Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA						
3546/8082A	Aroclor-1242	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1248	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1254	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1260	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1262	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH
3546/8082A	Aroclor-1268	ND D		0.98 mg/Kg	7/2/2019 AF	07/02/19 0:00 EH

Definitions:

- MDL - method detection limit
- J - Result was below the reporting limit, but at or above the MDL
- ND - indicates that the analyte was not detected at the reporting limit
- RL - Reporting Limit (Analytical)
- D - Dilution



USA Environmental Management, Inc.

344 West State Street
Trenton, New Jersey 08618

011908046

CLIENT: Lammey & Giorgio
PROJECT: Restoration Upgrades to Ext. Bldg Envelope
SITE: State Office Building
135 W. Hanover, Trenton NJ

DATE: 6/28/2019
TECHNICIAN: R. Reynolds/W. Weisgarber
PROJECT #: 19-020046-03

POLYCHLORINATED BIPHENYLS (PCBs) - CAULKS EPA SW-846 3540C/8082

SAMPLE

No.	Initial	LOCATION	MATERIAL DESCRIPTION / (ID No.)	SAMPLE TYPE
①	01 PCB	Brown Caulk at Metal Casing Seams	Interior window Caulks	<input type="checkbox"/> Grab <input checked="" type="checkbox"/> Composite
	062819	White Caulk @ Wood Trim Seams (Original)	(04/03)	
②	02 PCB	White Exterior wood Louver Seams - Penthouse	Ext. Louver Caulk	<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite
	062819		(13)	
③	03 PCB	Exterior Electrical Conduit Penetrations	White sealant	<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite
	062819		(17)	
④	04 PCB	Grey Exterior Window Frame to Metal Wall Interface - Penthouse	Grey Exterior Window Caulk	<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite
	062819		(23)	
⑤	05 PCB	Brown Metal Door Seams white Basement Door Remnants	Exterior Door Caulks	<input type="checkbox"/> Grab <input checked="" type="checkbox"/> Composite
	062819		(25/33)	
⑥	06 PCB	Small 1'x4' Windows @ Front North Façade - 1st Fl	Exterior Window Caulk Light Grey	<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite
	062819		(26)	
⑦	07 PCB	Front Door North Façade	Grey Exterior Door Caulk	<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite
	062819		(28)	
⑧	08 PCB	Exterior Window Well Grate Cover - Basement	Grate Cover Caulk	<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite
	062819		(30)	
⑨	09 PCB	Brown Ext. window Caulk @ Aluminium Casing Seams White Original Window Caulk @ Wood Trim Under Area.	Exterior Window Caulks	<input type="checkbox"/> Grab <input checked="" type="checkbox"/> Composite
	062819		(31/32)	
⑩	10 PCB	North South Concrete Stair Seams/Cracks	Exterior Stairway Sealant	<input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite
	062819		(34)	

TURN-AROUND-TIME	
<input type="checkbox"/> 1-Day	<input type="checkbox"/> 4-Days
<input type="checkbox"/> 2-Days	<input type="checkbox"/> 1-Week
<input type="checkbox"/> 3-Days	<input checked="" type="checkbox"/> 2-Weeks

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME
I. <u>R. Reynolds</u>	<u>6/28/19</u>		I. <u>[Signature]</u>	<u>6-28-19</u>	<u>2:45pm</u>
II.			II. <u>[Signature]</u>	<u>6/28</u>	<u>2:45pm</u>
III.			III.		

⑩

COMMENTS:

APPENDIX D

Laboratory Certifications
Inspector Licenses

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101165-0

International Asbestos Testing Laboratories

Mt. Laurel, NJ

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

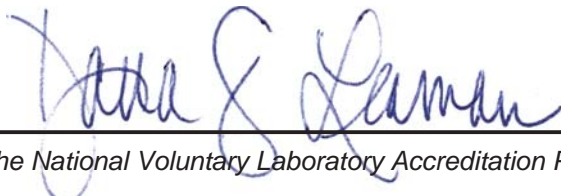
Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2018-07-01 through 2019-06-30

Effective Dates




For the National Voluntary Laboratory Accreditation Program



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

International Asbestos Testing Laboratories

9000 Commerce Parkway

Suite B

Mt. Laurel, NJ 08054

Mr. Frank E. Ehrenfeld III

Phone: 856-231-9449 Fax: 856-231-9818

Email: frankehrenfeld@iatl.com

<http://www.iatl.com>

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 101165-0

Bulk Asbestos Analysis

Code

Description

18/A01

EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples

18/A03

EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code

Description

18/A02

U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

A handwritten signature in blue ink, appearing to read "Frank E. Ehrenfeld III".

For the National Voluntary Laboratory Accreditation Program

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2020
Issued April 01, 2019

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. FRANK E. EHRENFELD III
INTERNATIONAL ASBESTOS TESTING LABS
9000 COMMERCE PARKWAY SUITE B
MOUNT LAUREL, NJ 08054

NY Lab Id No: 11021

*is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:*

Characteristic Testing

TCLP EPA 1311

Metals I

Lead, Total EPA 7000B

Miscellaneous

Asbestos in Friable Material Item 198.1 of Manual
EPA 600/M4/82/020

Asbestos in Non-Friable Material-PLM Item 198.6 of Manual (NOB by PLM)

Asbestos in Non-Friable Material-TEM Item 198.4 of Manual

Asbestos-Vermiculite-Containing Material Item 198.8 of Manual

Lead in Dust Wipes EPA 7000B

Lead in Paint ASTM D3335-85A

Sample Preparation Methods

EPA 3050B

ASTM D3335-85A

Serial No.: 59525

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

State of New Jersey
Department of Environmental Protection
Certifies That

EMSL ANALYTICAL INC
Laboratory Certification ID # 03036

is hereby approved as a

Nationally Accredited Environmental Laboratory
*to perform the analyses as indicated on the Annual Certified Parameter List
which must accompany this certificate to be valid*

having duly met the requirements of the
Regulations Governing the Certification of
Laboratories and Environmental Measurements N.J.A.C. 7:18 et. seq.
and
having been found compliant with the 2009 TNI Standard approved by the
The NELAC Institute

Expires June 30, 2019



A handwritten signature in blue ink that reads "Michele M. Potter".

Michele M. Potter
Manager



NJDEP is a NELAP Recognized Accreditation Body

**New Jersey Department of Environment Protection
Environmental Laboratory Certification Program**



Annual Certified Parameter List and Current Status

Effective as of 7/06/2018 until 6/30/2019

Laboratory Name: EMSL ANALYTICAL INC Laboratory Number: 03036 Activity ID: NLC 180002
200 RT 130 NORTH
CINNAMINSON NJ 08077

Category: SCM09--Organic Parameters - Chromatography

Status	Eligible to Report NJ Data	Code	Parameter	Technique	Approved Methods	Primary State
Certified	Yes	SCM09.02460	Dieldrin	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02470	Endosulfan I	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02480	Endosulfan II	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02490	Endosulfan sulfate	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02500	Endrin	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02510	Endrin aldehyde	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02520	Endrin ketone	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02540	Heptachlor	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02550	Heptachlor epoxide	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02580	Lindane (gamma BHC)	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02590	Methoxychlor	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02620	Mirex	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02660	Toxaphene	GC, Extraction, ECD or HECD, Capillary	SW-846 8081B	NJ
Certified	Yes	SCM09.02980	Chlorobiphenyl (2-) (PCB 1)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.02990	Dichlorobiphenyl (2,3-) (PCB 5)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03000	Trichlorobiphenyl (2,2',5-) (PCB 18)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03010	Trichlorobiphenyl (2,4',5-) (PCB 31)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ

New Jersey Department of Environment Protection
Environmental Laboratory Certification Program



Annual Certified Parameter List and Current Status

Effective as of 7/06/2018 until 6/30/2019

Laboratory Name: EMSL ANALYTICAL INC Laboratory Number: 03036 Activity ID: NLC 180002
200 RT 130 NORTH
CINNAMINSON NJ 08077

Category: SCM09—Organic Parameters - Chromatography

Status	Eligible to Report NJ Data	Code	Parameter	Technique	Approved Methods	Primary State
Certified	Yes	SCM09.03020	Tetrachlorobiphenyl (2,2',3,5'-) (PCB 44)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03030	Tetrachlorobiphenyl (2,2',5,5'-) (PCB 52)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03040	Tetrachlorobiphenyl (2,3',4,4'-) (PCB 66)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03050	Pentachlorobiphenyl (2,2',3,4,5'-) (PCB 87)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03060	Pentachlorobiphenyl (2,2',4,5,5'-) (PCB 101)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03070	Pentachlorobiphenyl (2,3,3',4',6-) (PCB 110)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03100	Hexachlorobiphenyl (2,2',3,4,4',5'-) (PCB 138)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03110	Hexachlorobiphenyl (2,2',3,4,5,5'-) (PCB 141)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03120	Hexachlorobiphenyl (2,2',3,5,5',6-) (PCB 151)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03130	Hexachlorobiphenyl (2,2',4,4',5,5'-) (PCB 153)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03140	Heptachlorobiphenyl (2,2',3,3',4,4',5-) (PCB 170)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03150	Heptachlorobiphenyl (2,2',3,4,4',5,5'-) (PCB 180)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03160	Heptachlorobiphenyl (2,2',3,4,4',5',6-) (PCB 183)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03170	Heptachlorobiphenyl (2,2',3,4',5,5',6-) (PCB 187)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03180	Nonachlorobiphenyl (2,2',3,3',4,4',5,5',6-) (PCB 206)	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03190	PCB 1016	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03200	PCB 1221	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ

New Jersey Department of Environment Protection
Environmental Laboratory Certification Program



Annual Certified Parameter List and Current Status

Effective as of 7/06/2018 until 6/30/2019

Laboratory Name: EMSL ANALYTICAL INC Laboratory Number: 03036 Activity ID: NLC 180002
200 RT 130 NORTH
CINNAMINSON NJ 08077

Category: SCM09--Organic Parameters - Chromatography

Status	Eligible to Report NJ Data	Code	Parameter	Technique	Approved Methods	Primary State
Certified	Yes	SCM09.03210	PCB 1232	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03220	PCB 1242	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03230	PCB 1248	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03240	PCB 1254	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03250	PCB 1260	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03260	PCB 1262	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ
Certified	Yes	SCM09.03270	PCB 1268	GC, Extraction, ECD or HECD, Capillary	SW-846 8082A	NJ

Category: SCM10--Organic Parameters - Chromatography/MS

Status	Eligible to Report NJ Data	Code	Parameter	Technique	Approved Methods	Primary State
Applied	No	SCM10.00010	Extractable Petroleum Hydrocarbons	Extraction, GC/MS, Capillary	Other NJDEP EPH 10/08, Rev. 3	NJ
Certified	Yes	SCM10.05810	Acetone	GC/MS, P & T or Direct Injection, Capillary	SW-846 8260C	NJ
Certified	Yes	SCM10.05820	Acetonitrile	GC/MS, P & T or Direct Injection, Capillary	SW-846 8260C	NJ
Certified	Yes	SCM10.05830	Acrolein	GC/MS, P & T or Direct Injection, Capillary	SW-846 8260C	NJ
Certified	Yes	SCM10.05840	Acrylonitrile	GC/MS, P & T or Direct Injection, Capillary	SW-846 8260C	NJ
Applied	No	SCM10.05850	Allyl chloride	GC/MS, P & T or Direct Injection, Capillary	SW-846 8260C	NJ
Certified	Yes	SCM10.05870	Benzene	GC/MS, P & T or Direct Injection, Capillary	SW-846 8260C	NJ

54079

NAETI Inc.

CERTIFICATE OF COMPLETION

AHERA/EPA Accredited Per 40 CFR Part 763
Asbestos Accreditation under TSCA Title II

This is to certify that

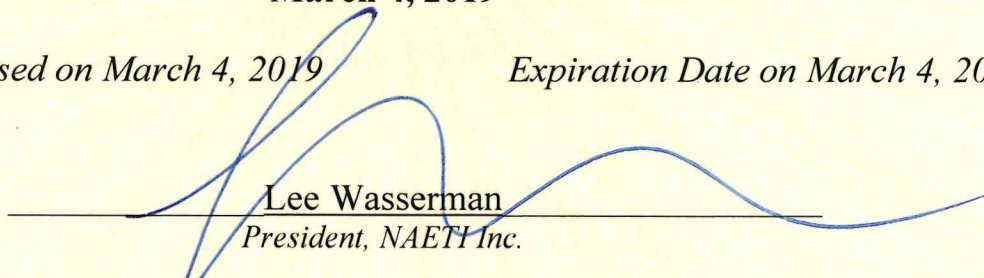
William Weisgarber Jr.

Successfully completed the course entitled

**1/2-Day New York State/EPA/AHERA Asbestos Building Inspector Annual Refresher on
March 4, 2019**

Examination Passed on March 4, 2019

Expiration Date on March 4, 2020



Lee Wasserman
President, NAETI Inc.

Per 10 NYCRR Part 73.2 (L) (1), DOH 2832 Certificate of Completion of Asbestos
Safety Training is the only official record of training for N.Y.S. students.

Language: English

ABIH 1/2 CM POINT

3321 Doris Avenue, Building B, Ocean, NJ 07712

Phone (732) 531-5571

Fax (732) 531-5956

www.naeti.com

53313

NAETI Inc.

CERTIFICATE OF COMPLETION

AHERA/EPA Accredited Per 40 CFR Part 763
Asbestos Accreditation under TSCA Title II

This is to certify that

Richard Reynolds

Successfully completed the course entitled

**1/2-Day New York State/EPA/AHERA Asbestos Building Inspector Annual Refresher on
October 1, 2018**

Examination Passed on October 1, 2018

Expiration Date on October 1, 2019



Lee Wasserman

President, NAETI Inc.

Per 10 NYCRR Part 73.2 (L) (1), DOH 2832 Certificate of Completion of Asbestos
Safety Training is the only official record of training for N.Y.S. students.

Language: English

ABIH 1/2 CM POINT

3321 Doris Avenue, Building B, Ocean, NJ 07712

Phone (732) 531-5571

Fax (732) 531-5956

www.naeti.com

WILLIAM WEISGARBER, JR.
STATE OF NEW JERSEY
DEPARTMENT OF HEALTH
LEAD INSPECTOR / RISK ASSESSOR
PERMIT NO.: 033657
ID NO.: 011943
EXPIRES: 5/2/2020

Lead Identification Permit

New Jersey Department of Health

WILLIAM WEISGARBER, JR



Permit No.: 033657
ID No.: 011943
Expires: 5/2/2020

Authorization Signature: *Christina Tan*
Christina Tan, MD, M.P.H., Assistant Commissioner

Inspector/Risk Assessor

RICHARD J. REYNOLDS
STATE OF NEW JERSEY
DEPARTMENT OF HEALTH
LEAD INSPECTOR / RISK ASSESSOR
PERMIT NO.: 032996
ID NO.: 029956
EXPIRES: 2/22/2020

New Jersey Department of Health

RICHARD J REYNOLDS



Permit No.: 032996
ID No.: 029956
Expires: 2/22/2020

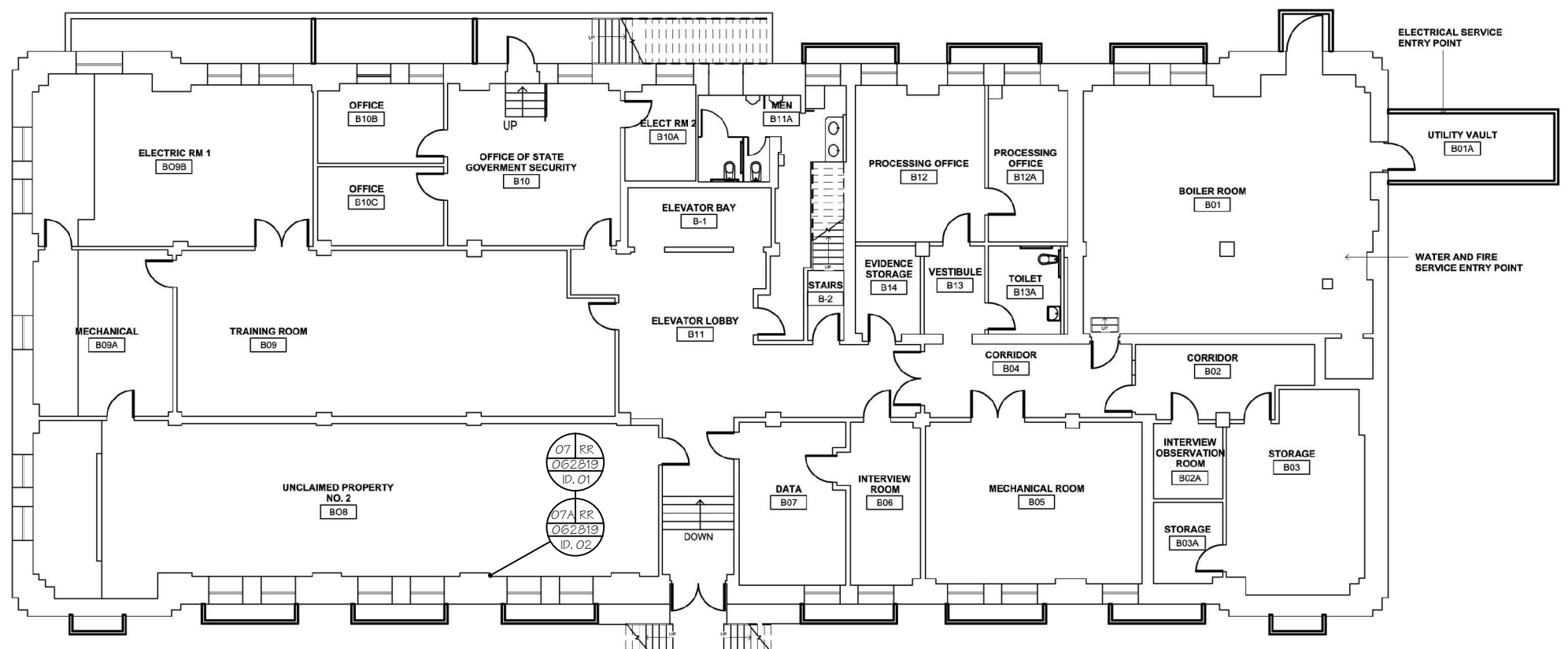
Authorization Signature *Christina Tan*
Christina Tan, MD, MPH, Assistant Commissioner

Inspector/Risk Assessor

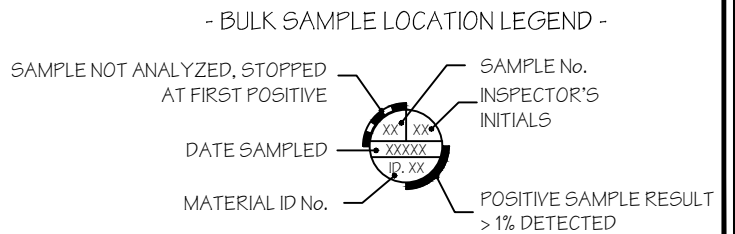
Lead Identification Permit

APPENDIX E

Asbestos Sample Location Plans



1 BASEMENT FLOOR PLAN
 HA.1 SCALE: 1/16" = 1'-0"



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 Environmental, Engineering & Construction

State Office Building
 135 West Hanover Street
 Trenton, Mercer County, NJ
 Restoration Upgrades to
 Exterior Building Envelope

William Weisgarber, Jr. USEPA Building Inspector
 Certificate No. NAETI 154079

Richard J. Reynolds, USEPA Building Inspector
 Certificate No. NAETI 153313

USAEMI
 Project Number:
 19-020046-03

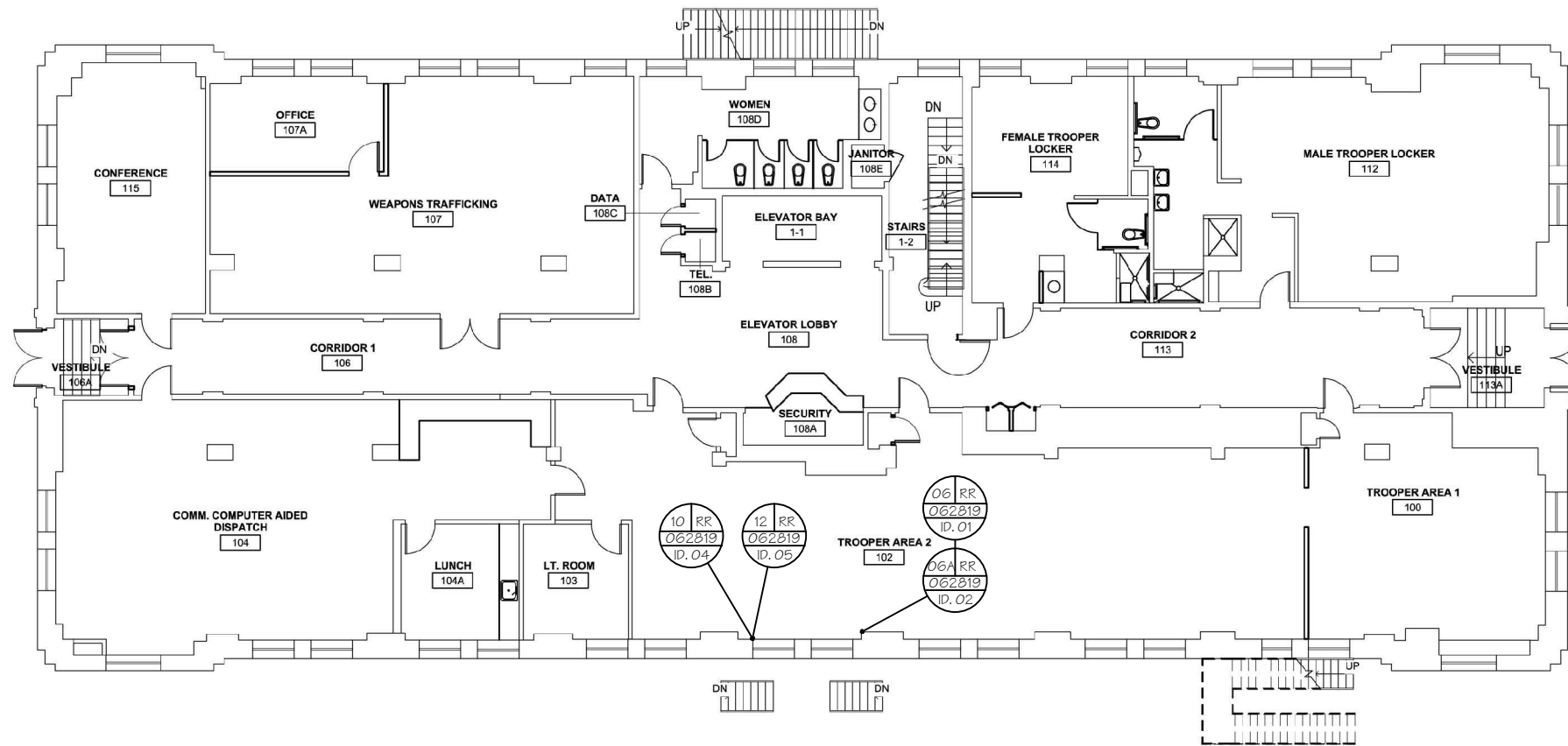
Date: 07-15-2019
 Drawn by: W.K.M.

Scale: AS NOTED
 Checked by: W.W.J.

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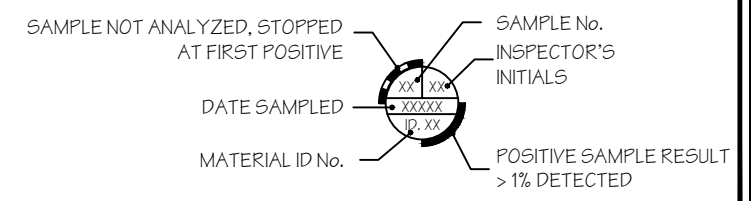
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Sheet: 1 of 11



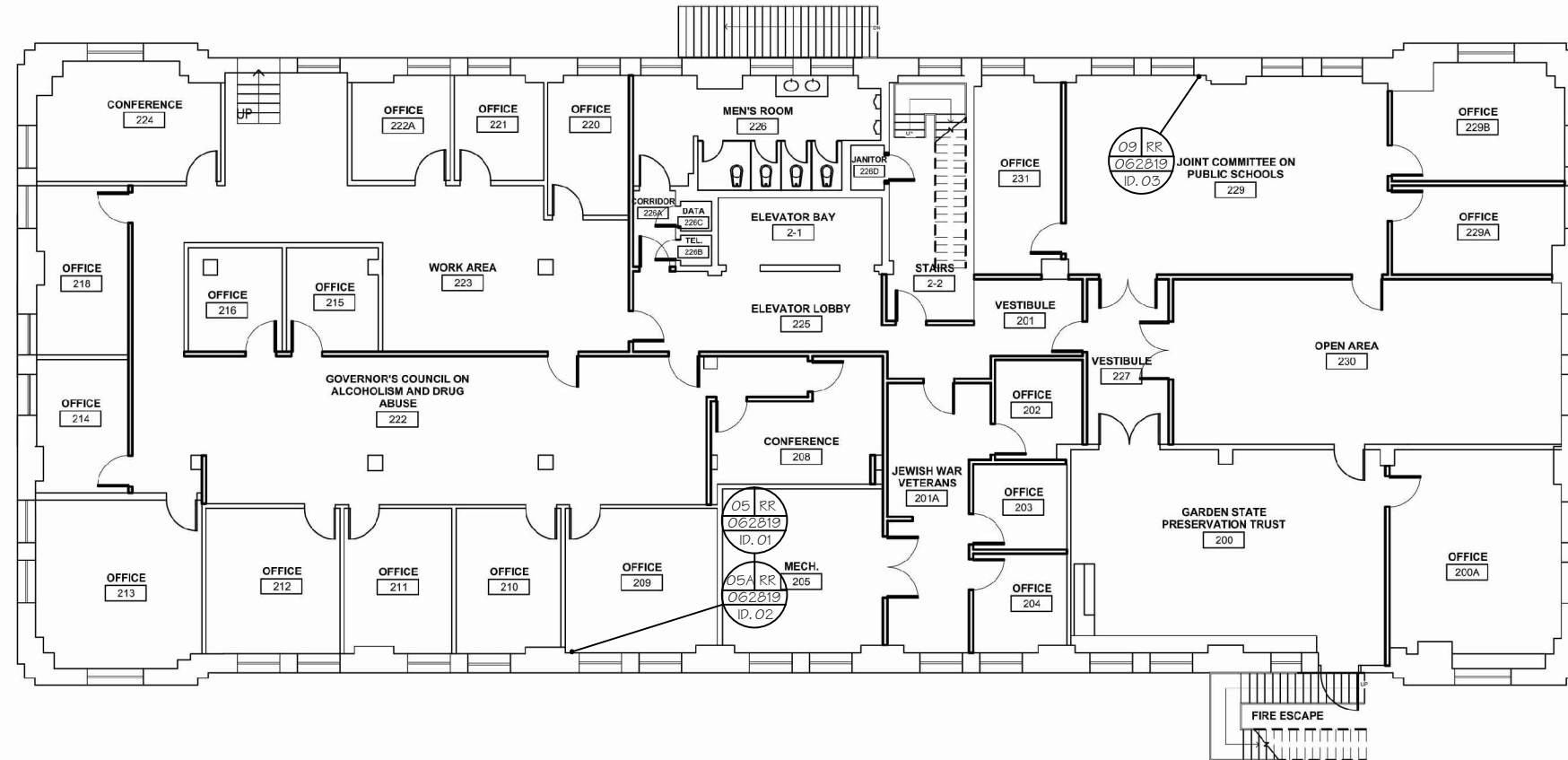
1 FIRST FLOOR PLAN
 HA.2 SCALE: 1/16" = 1'-0"

- BULK SAMPLE LOCATION LEGEND -



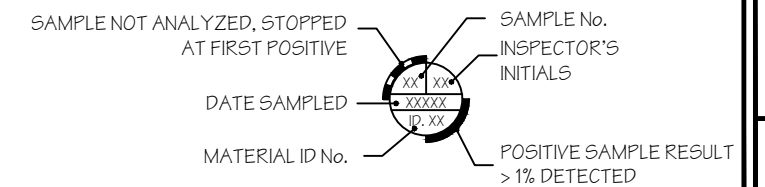
Rev:	Date:	By:

USA Environmental Management, Inc. 344 West State Street Trenton, NJ 08618 609.656.8101 Environmental, Engineering & Construction	USAEMI Project Number: 19-020046-03
State Office Building 135 West Hanover Street Trenton, Mercer County, NJ Restoration Upgrades to Exterior Building Envelope	Date: 07-15-2019 Drawn by: W.K.M. Scale: AS NOTED Checked by: W.W.J.
William Weisgarber, Jr. USEPA Building Inspector Certificate No. NAETI 154079 Richard J. Reynolds, USEPA Building Inspector Certificate No. NAETI 153313	Drawing Title: Bulk Sample Location Plan Drawing No. HA.2
Sheet: 2 of 11	



1 SECOND FLOOR PLAN
 HA.3 SCALE: 1/16" = 1'-0"

- BULK SAMPLE LOCATION LEGEND -



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 Project Number:
 19-020046-03

Date: 07-15-2019
 Drawn by: W.K.M.
 Scale: AS NOTED
 Checked by: W.W.J.

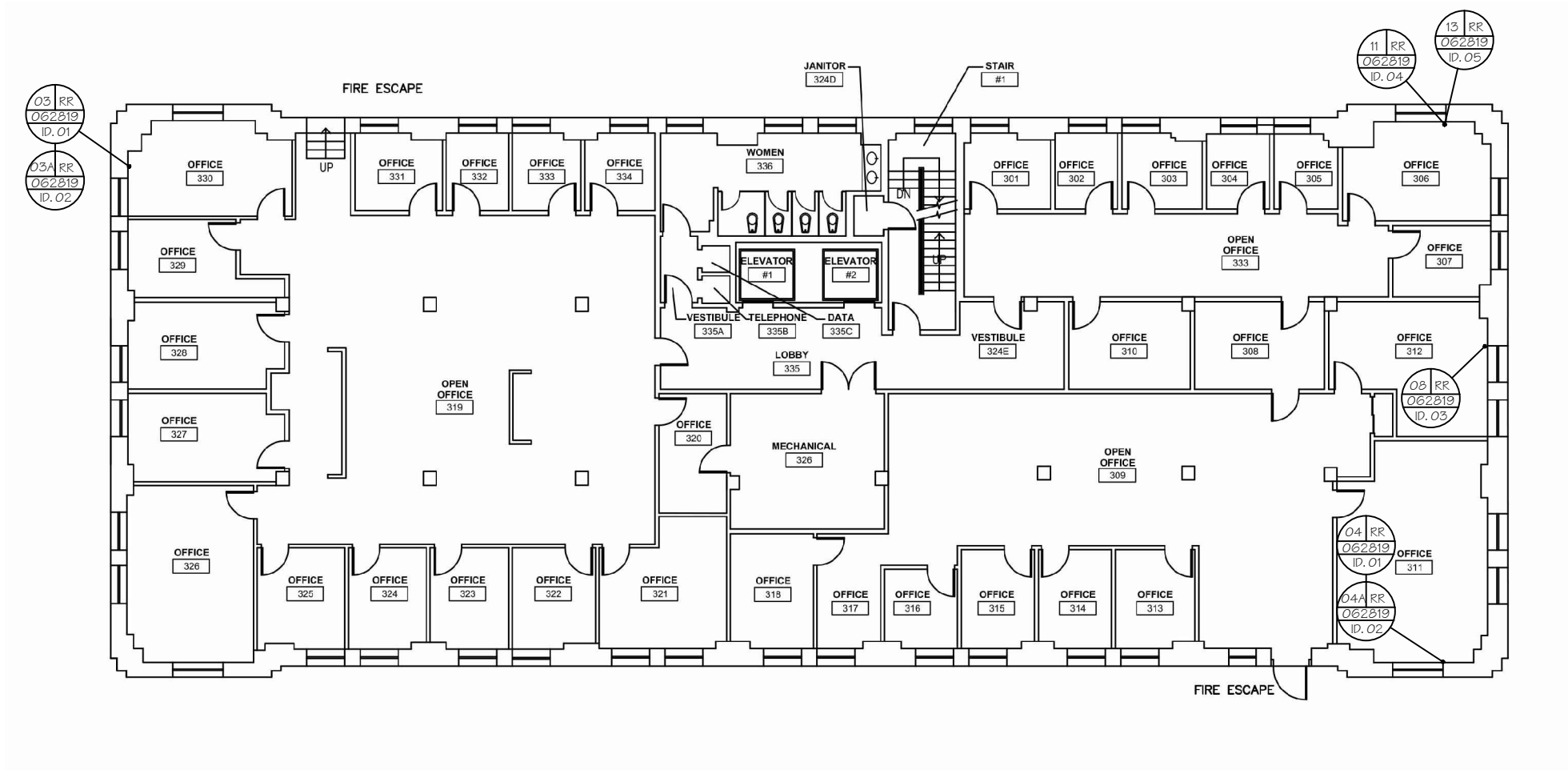
William Weisgarber, Jr. USEPA Building Inspector
 Certificate No. NAETI 154079
 Richard J. Reynolds, USEPA Building Inspector
 Certificate No. NAETI 153313

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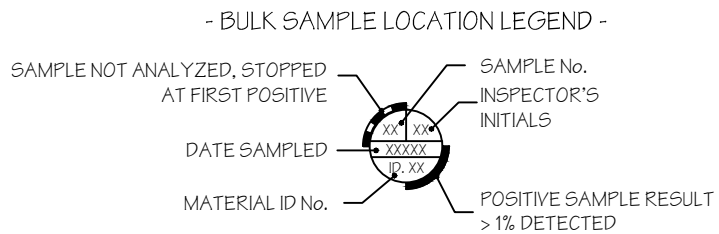
State Office Building
 135 West Hanover Street
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Drawing Title:
 Bulk Sample Location Plan

Drawing No.
HA.3



1 THIRD FLOOR PLAN
 HA.4 SCALE: 1/16" = 1'-0"



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USAEMI
 Project Number:
 19-020046-03

Date:
 07-15-2019
 Drawn by:
 W.K.M.

Scale:
 AS NOTED
 Checked by:
 W.W.J.

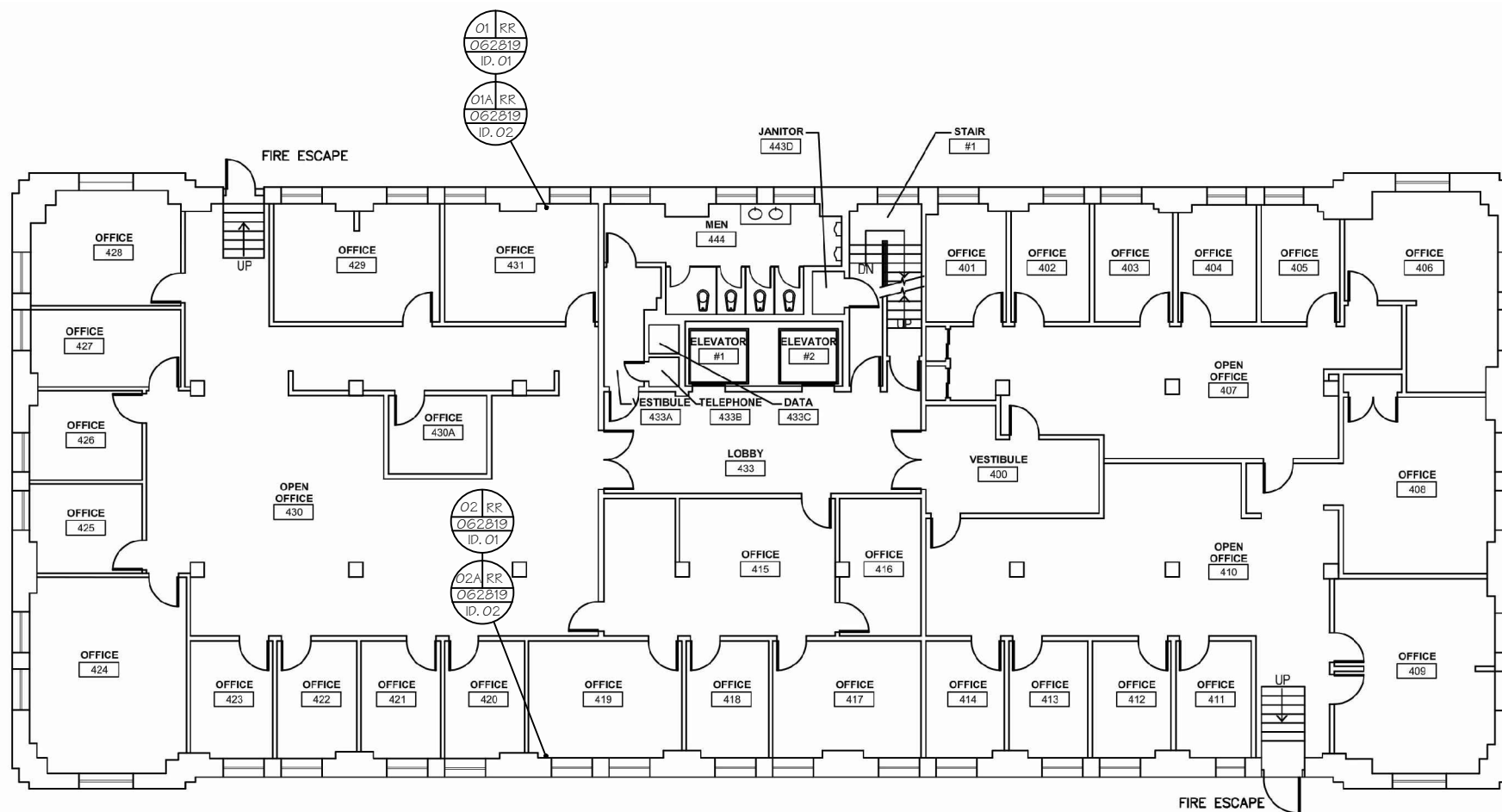
William Weisgarber, Jr. USEPA Building Inspector
 Certificate No. NAETI154079

Richard J. Reynolds, USEPA Building Inspector
 Certificate No. NAETI153313

Drawing Title:
 Bulk Sample
 Location Plan

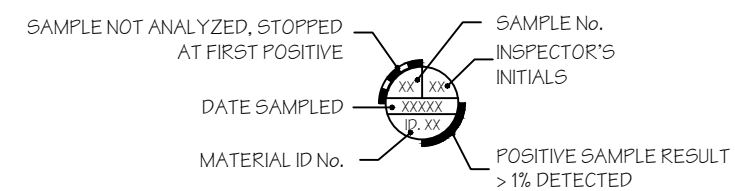
Drawing No.
 HA.4

Sheet: 4 of 11



1 FOURTH FLOOR PLAN
 HA.5 SCALE: 1/16" = 1'-0"

- BULK SAMPLE LOCATION LEGEND -



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USAEMI
 Project Number:
 19-020046-03

Scale: AS NOTED
 Date: 07-15-2019
 Drawn by: W.K.M.
 Checked by: W.W.J.

William Weisgarber, Jr. USEPA Building Inspector
 Certificate No. NAETI 154079
 Richard J. Reynolds, USEPA Building Inspector
 Certificate No. NAETI 153313

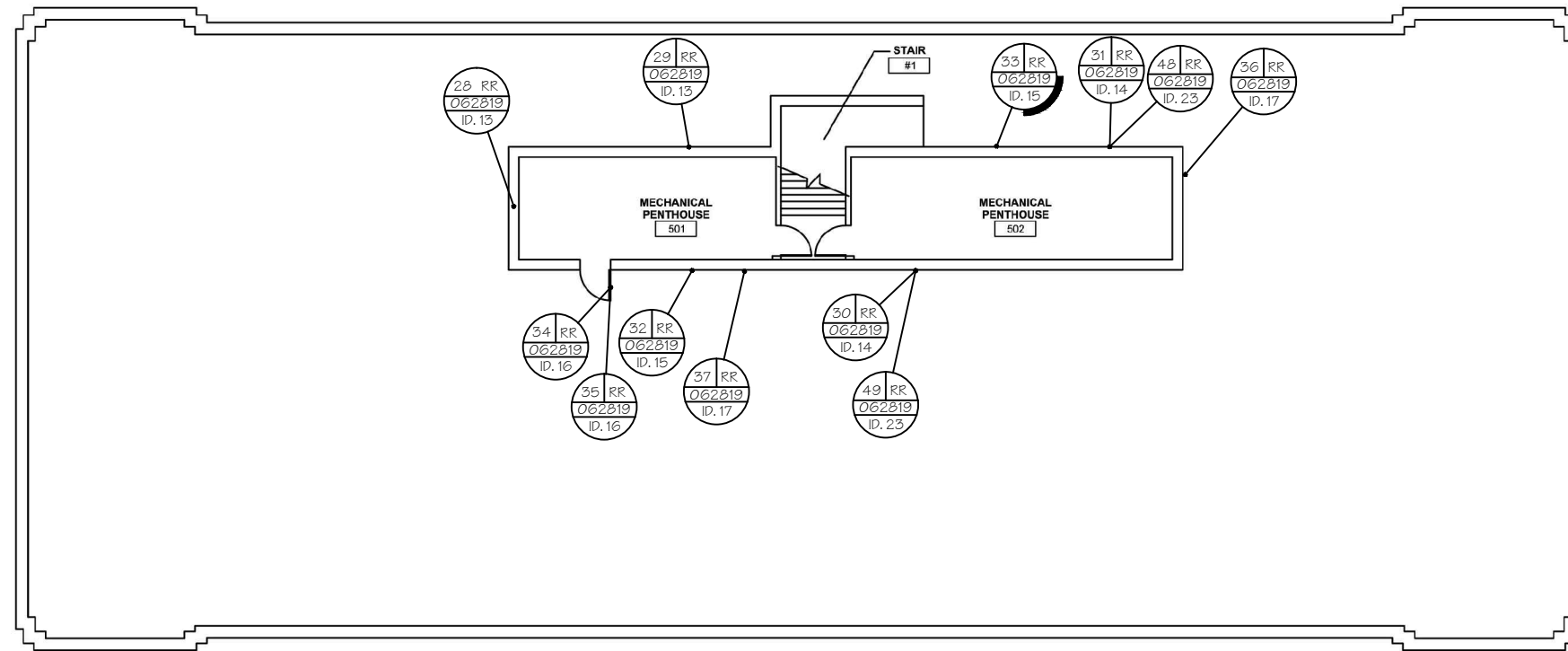
USA Environmental Management, Inc.
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State Office Building
 135 West Hanover Street
 Trenton, Mercer County, NJ
 Restoration Upgrades to
 Exterior Building Envelope

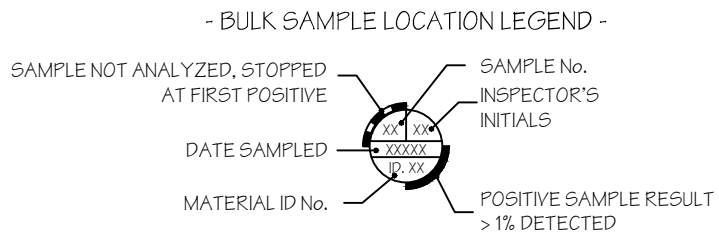
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 Bulk Sample
 Location Plan

Drawing No.

HA.5

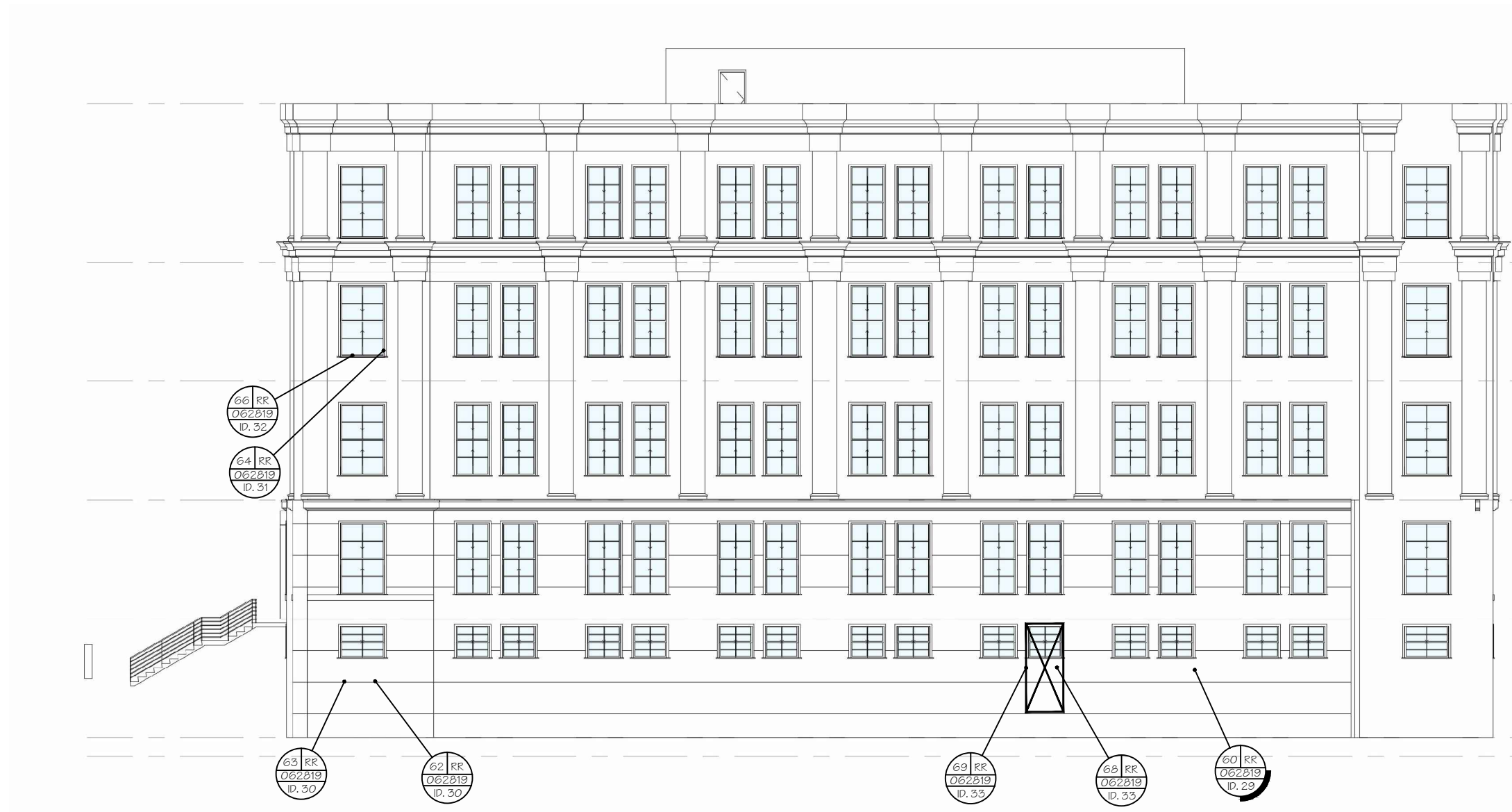


1 PENTHOUSE FLOOR PLAN
 HA.6 SCALE: 1/16" = 1'-0"



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USA Environmental Management, Inc. 344 West State Street Trenton, NJ 08618 609.656.8101 Environmental, Engineering & Construction	William Weisgarber, Jr. USEPA Building Inspector Certificate No. NAETI 154079 Richard J. Reynolds, USEPA Building Inspector Certificate No. NAETI 153313	USAEMI Project Number: 19-020046-03
State Office Building 135 West Hanover Street Trenton, Mercer County, NJ Restoration Upgrades to Exterior Building Envelope	Drawing Title: Bulk Sample Location Plan	Date: 07-15-2019 Drawn by: W.K.M.
Drawing No. HA.6	Scale: AS NOTED Checked by: W.W.J.	Project Number: 19-020046-03
Sheet: 6 of 11		



1 WEST (RIGHT) ELEVATION
 HA.7 SCALE: 1/16" = 1'-0"

- BULK SAMPLE LOCATION LEGEND -

SAMPLE NOT ANALYZED, STOPPED AT FIRST POSITIVE

DATE SAMPLED

MATERIAL ID No.

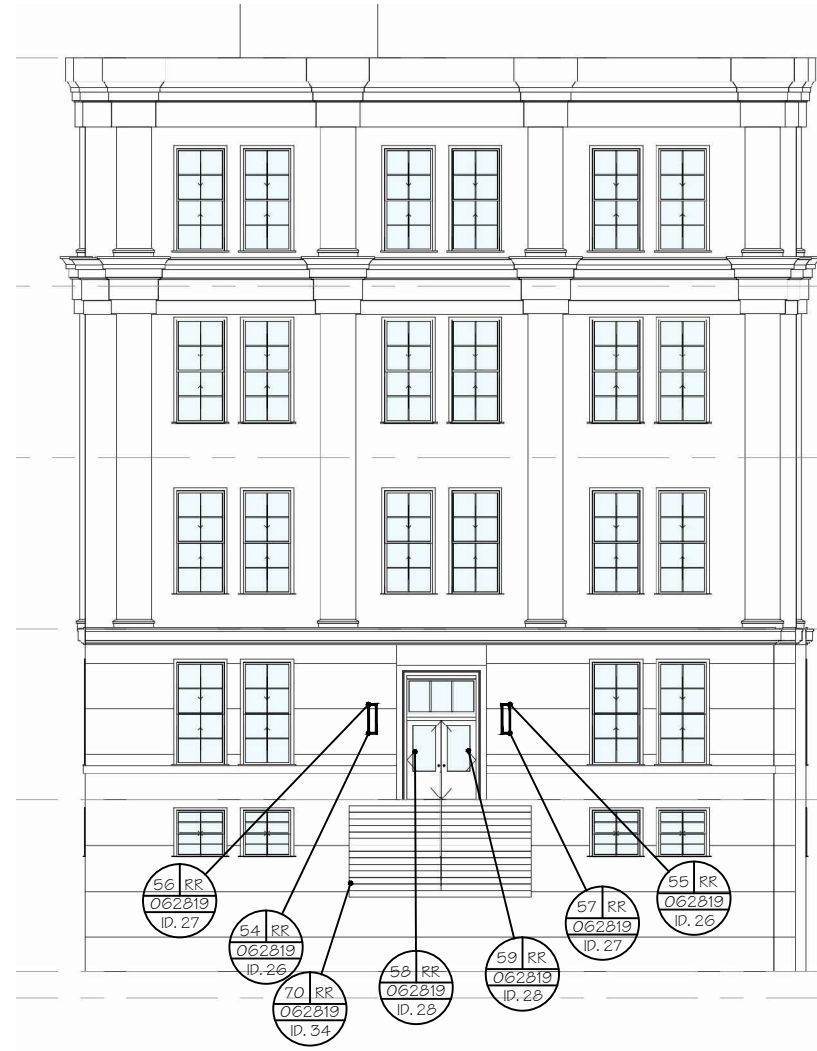
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INSPECTOR'S INITIALS

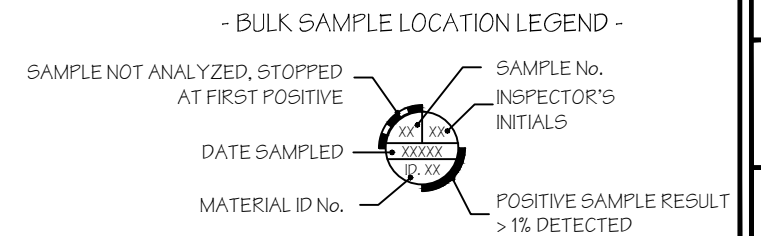
POSITIVE SAMPLE RESULT > 1% DETECTED

Rev:	Date:	By:

USAEMI Project Number: 19-020046-03	Scale: AS NOTED	Date: 07-15-2019	Checked By: W.W.J.
William Weisgarber, Jr. USEPA Building Inspector Certificate No. NAETI 154079		Richard J. Reynolds, USEPA Building Inspector Certificate No. NAETI 153313	
USA Environmental Management, Inc. 344 West State Street Trenton, NJ 08618 609.656.8101 Environmental, Engineering & Construction			
State Office Building 135 West Hanover Street Trenton, Mercer County, NJ		Restoration Upgrades to Exterior Building Envelope	
Drawing Title: Bulk Sample Location Plan			
Drawing No. HA.7			
Sheet: 7 of 11			



1 NORTH (FRONT) ELEVATION
 HA.8 SCALE: 1/16" = 1'-0"



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USAEMI
 Project Number:
 19-020046-03

Scale:
 AS NOTED
 Checked By:
 W.W.J.

Date:
 07-15-2019
 Drawn by:
 W.K.M.

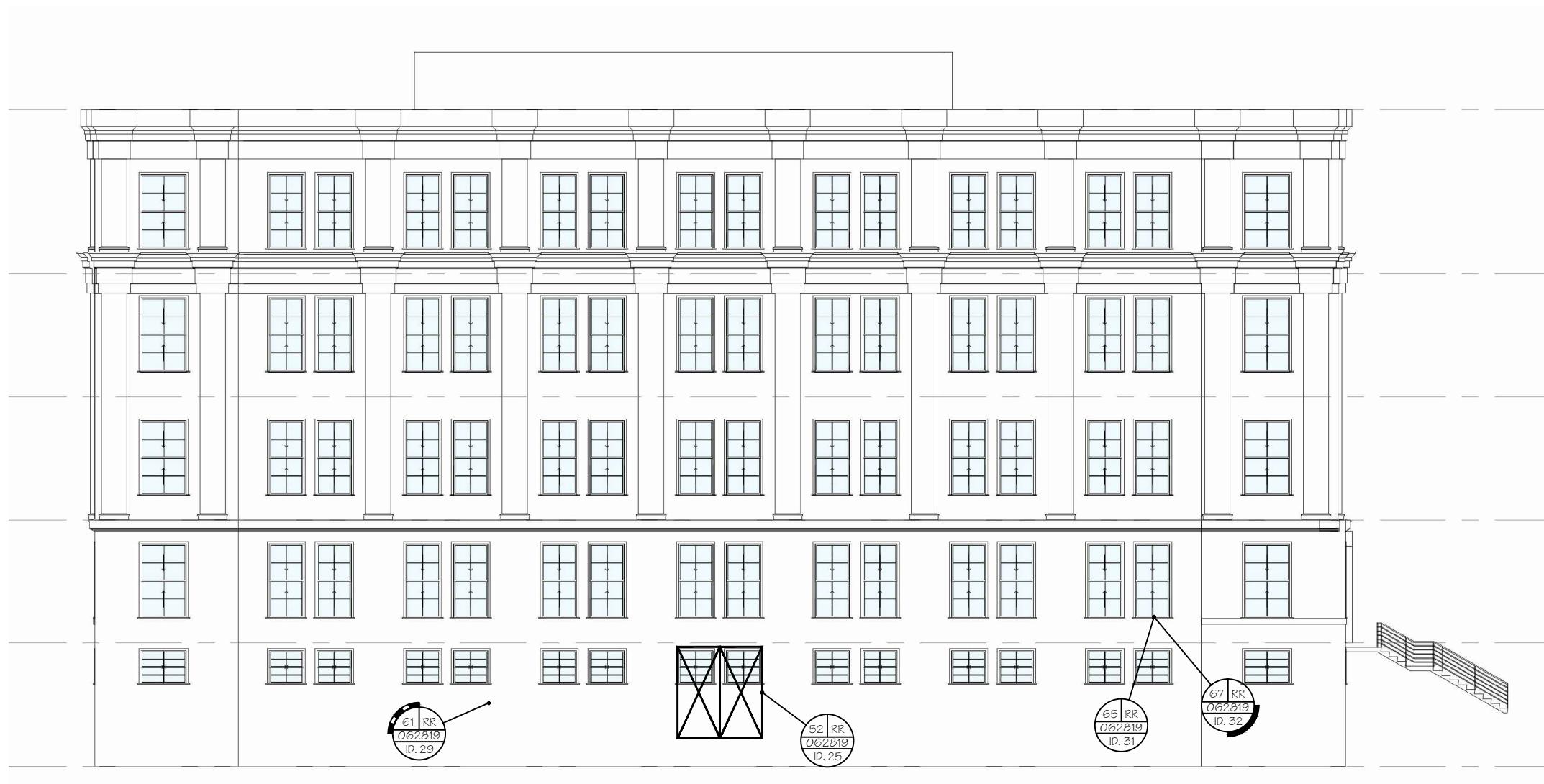
William Weisgarber, Jr. USEPA Building Inspector
 Certificate No. NAETI 154079
 Richard J. Reynolds, USEPA Building Inspector
 Certificate No. NAETI 153313

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State Office Building
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 Trenton, Mercer County, NJ
 Restoration Upgrades to
 Exterior Building Envelope

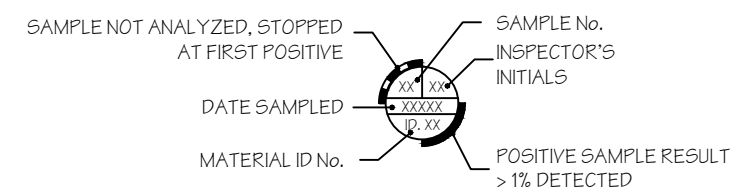
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 Bulk Sample
 Location Plan

Drawing No.
 HA.8



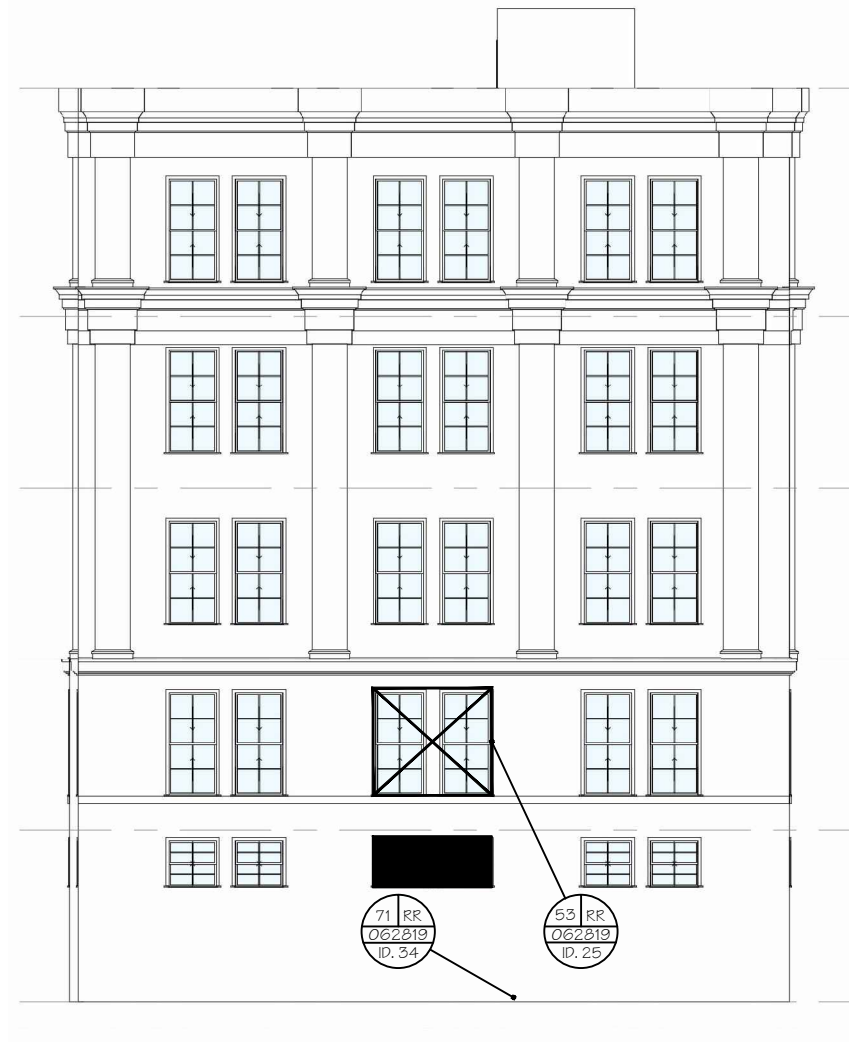
1 EAST (LEFT) ELEVATION
 HA.9 SCALE: 1/16" = 1'-0"

- BULK SAMPLE LOCATION LEGEND -

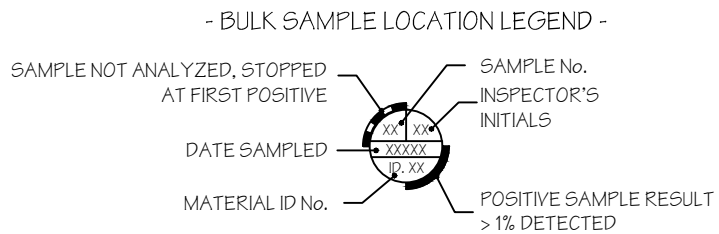


Rev:	Date:	By:

USA Environmental Management, Inc. 344 West State Street Trenton, NJ 08618 609.656.8101 Environmental, Engineering & Construction	William Weisgarber, Jr. USEPA Building Inspector Certificate No. NAETI 154079 Richard J. Reynolds, USEPA Building Inspector Certificate No. NAETI 153313	USAEMI Project Number: 19-020046-03
State Office Building 135 West Hanover Street Trenton, Mercer County, NJ Restoration Upgrades to Exterior Building Envelope	Date: 07-15-2019 Drawn by: W.K.M.	Scale: AS NOTED Checked by: W.W.J.
Drawing Title: Bulk Sample Location Plan		Drawing No. HA.9
Sheet: 9 of 11		



1 SOUTH (REAR) ELEVATION
 HA.10 SCALE: 1/16" = 1'-0"

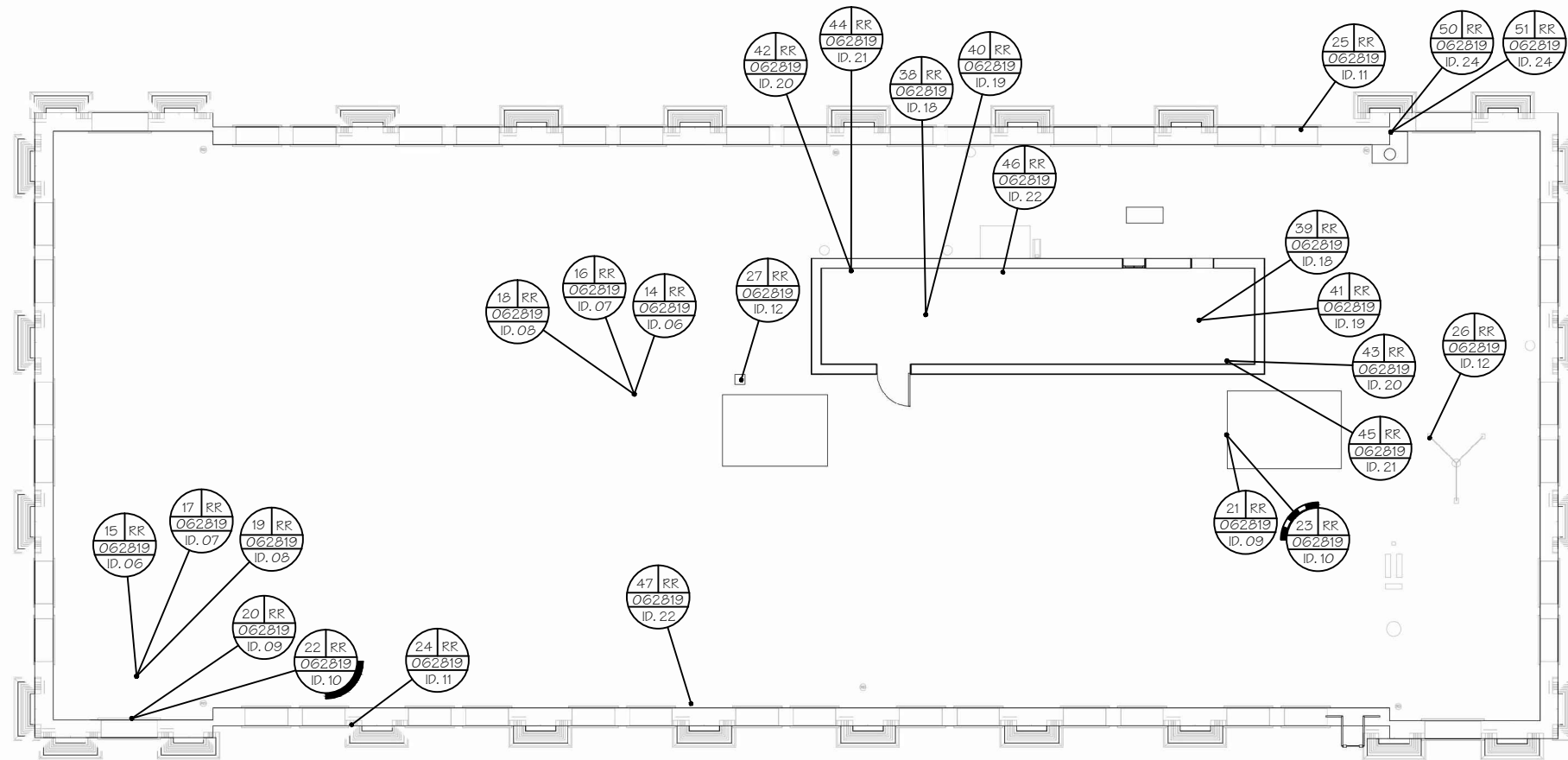


Rev:	Date:	By:

USA Environmental Management, Inc. 344 West State Street Trenton, NJ 08618 609.656.8101 Environmental, Engineering & Construction	State Office Building 135 West Hanover Street Trenton, Mercer County, NJ Restoration Upgrades to Exterior Building Envelope	USAEMI Project Number: 19-020046-03
USA Environmental Management, Inc. 344 West State Street Trenton, NJ 08618 609.656.8101 Environmental, Engineering & Construction		
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Drawing No. HA.10		
Sheet: 10 of 11		

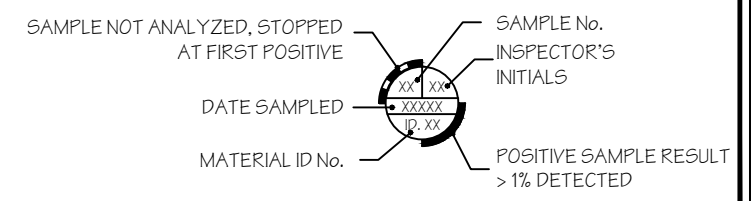
Date: 07-15-2019
 Drawn by: W.K.M.
 Scale: AS NOTED
 Checked by: W.W.J.

William Weisgarber, Jr. USEPA Building Inspector
 Certificate No. NAETI 154079
 Richard J. Reynolds, USEPA Building Inspector
 Certificate No. NAETI 153313



1 ROOF PLAN
 HA.11 SCALE: 1/16" = 1'-0"

- BULK SAMPLE LOCATION LEGEND -



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State Office Building 135 West Hanover Street Trenton, Mercer County, NJ Restoration Upgrades to Exterior Building Envelope	USA Environmental Management, Inc. 344 West State Street Trenton, NJ 08618 609.656.8101 Environmental, Engineering & Construction	William Weisgarber, Jr. USEPA Building Inspector Certificate No. NAETI 154079 Richard J. Reynolds, USEPA Building Inspector Certificate No. NAETI 153313	USAEMI Project Number: 19-020046-03
Drawing Title: Bulk Sample Location Plan		Drawing No. HA.11	
Date: 07-15-2019		Scale: AS NOTED	
Drawn by: W.K.M.		Checked by: W.W.J.	
Sheet: 11 of 11			

SECTION 028300 – TREATMENT OF LEAD IN CONSTRUCTION

PART 1 – GENERAL REQUIREMENTS

1.1 RELATED DOCUMENTS

- A. General and Supplementary General Conditions, and the Contract Drawings apply to this Section.
- A. Section 074213 – Metal Wall Panels
- B. Section 075200 – SBS MBM Roofing
- C. Section 076200 – Sheet Metal Flashing and Trim
- D. Section 081113 – Hollow Metal Doors & Frames
- E. Section 085250 – Double Hung Wood Windows

1.2 CONDITIONS

- A. For the purposes of this document, the term Contractor shall apply to any and all Trades that will disturb surfaces, components, objects, etc., coated with paint, shellac, varnish, stains, etc., and potentially generate dust, debris, airborne contaminants, etc., as a result of the Restoration Upgrades to Exterior Building Envelope at the State Office Building (DPMC Project No. A1310-00).
- B. Lead-Components (Refer to HAZMAT – Hazardous Materials Inspection Report in Division 2 – Existing Conditions; titled “Limited Hazardous Materials Report” Table 2 prepared by USA Environmental Management, Inc., dated July 15, 2019 for details).
- C. The surfaces scheduled to be impacted as a result of the Restoration Upgrades to Exterior Building Envelope at the State Office Building may be lead comprised or have lead-based paint as defined by the United States Department of Labor, Occupational Safety and Health Administration, (OSHA), is anticipated throughout all painted building components. OSHA does not establish a threshold for lead-containing paint. Therefore, the Contractor shall comply with 29 CFR, Part 1926.62, and the New Jersey Public Employee Occupational Safety and Health (PEOSH) program, Indoor Air Quality Standard, N.J.A.C. 12:100-13.
- D. Work referenced within these Technical Specifications is not to address potential lead health issues and children, as outlined by N.J.A.C. 5:17, which is the New Jersey Lead Hazard Evaluation and Abatement Code; 40 CFR, Part 745, the Lead-Based Paint Poisoning Prevention in Certain Residential Structures, including child occupied buildings; and/or N.J.A.C. 5:10, the New Jersey Regulations for Lead-Safety Maintenance of Rental Housing.
- E. Treatment of Painted Surfaces: OSHA does not establish a threshold lead level to determine a coating as lead-based paint. As such, the Contractor shall utilize appropriate engineering controls and personal protective equipment when disturbing paint. This shall also apply for any

renovation/demolition work that generates nuisance dust/particulates. Further, State Facilities are within the jurisdiction of the New Jersey Public Employees Occupational Safety and Health program, which requires, at a minimum, the use of engineering controls during construction work to minimize dust/particulates.

1. To fulfill the requirements of OSHA, the disturbance, of any lead-containing painted surface, should be treated by a Contractor in accordance with 29 CFR, Part 1926.62, the OSHA “Lead in Construction Standard.” In addition, State Facilities are within the jurisdiction of PEOSH. The New Jersey Air Quality Standard, N.J.A.C. 12:100-13, requires the Contractor’s engineering controls diffuse dust, stone and other small particles, toxic gases or other harmful substances in quantities hazardous to health by means of work area isolation, local ventilation and other protective devices.
2. OSHA’s “Lead in Construction Standard” requires, at a minimum, the Contractor to provide a site specific Lead Safety Plan to address:
 - a. Worker protection, including respiratory protection;
 - b. Worksite contamination, clean-up, including personal hygiene, and waste disposal; and
 - c. Exposure monitoring for workers as required by the OSHA, for those persons whose trade will disturb painted surfaces as a result of renovation/demolition activities, paint refinishing, construction and re-construction, etc.

1.3 CONTINGENCY

- A. The intent of this Technical Specification is to provide information and guidance for the disturbance of surface coatings where the work shall generate dust, debris and airborne particulates that may be coated with lead-based paint or lead-containing paint. Should the appropriate Trade performing the work specified that generates these conditions as a result of related renovation/demolition require the use of a Lead Abatement Contractor, licensed by the State of New Jersey, Department of Community Affairs, (DCA), the Lead Abatement Contractor shall not be advertised as such, since the work specified in these Technical Specifications relates to the construction industry and not that of a lead hazard.

1.4 COORDINATION

- A. The Contractor shall coordinate all activities with the Owner’s Representative; where the Trade performing the work specified herein is a sub-contractor, the sub-contractor shall coordinate all work with the Prime Contractor for coordination with the Owner’s Representative.
- B. Coordination of work shall be notified, at a minimum within forty-eight (48) hours of an event. The exception shall be that of emergency situations.

1.5 CONTRACT DOCUMENTS

- A. Contract Documents: Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Documents include, but are not necessarily limited to, the following:

1. Applicable federal, state and local codes and regulations.
2. Notices and Permits.
3. Existing site conditions and restrictions on the use of the site.
4. Work performed prior to work under this Contract.
5. Alterations and coordination with existing work.

1.6 DEFINITIONS

A. Definitions contained in this Section are not necessarily complete, but are general to the extent that they are not defined more explicitly elsewhere in the Contract Documents.

1. Indicated – This term refers to graphic representations, notes or schedules on the drawings, or other Paragraphs or Schedules in Specifications, and similar requirements in Contract Documents. Where terms such as "shown," "noted", "scheduled" and "specified" are used, it is to help locate the reference; no limitation on location is intended except as specifically noted.
2. Directed – Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Owner's Representative," "requested by the Owner's Representative," and similar phrases. However, no implied meaning shall be interpreted to extend the Owner's Representative's responsibility into the Contractor's area of construction supervision.
3. Approve – The term "approved," where used in conjunction with the Owner's Representative's action on the Contractor's submittals, application, and request, is limited to the responsibilities and duties stated in General and Supplementary Conditions. Such approval shall not release the Contractor from the responsibility to fulfill other Contract requirements.
4. Regulation – The term "Regulations" includes laws, statutes, ordinances and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the work, whether they are lawfully imposed by authorities having jurisdiction or not.
5. Furnish – The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."
6. Install – The term "install" is used to describe operations at the project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations."
7. Provide – The term "provide" means "to furnish and install, complete and ready for the intended use."
8. Installer – An "Installer" is an entity engaged by the Contractor, either an employee, subcontractor or sub-subcontractor for performance of a particular construction activity, including installation, erection, application and similar operations.
9. Project Site – The Project Site is the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other construction as part of the project. The extent of the project site is shown on the drawings and may or may not be identical with the description of the land upon which the project is to be built and/or the facility.
10. Testing Laboratories – A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the project site or elsewhere, to report on, and, if required, to interpret, results of those inspections or tests.
11. Owner's Representative – The Owner's Representative will represent the Owner during construction. The Owner's Representative will advise and consult with the Owner. The

Owner's instructions to the Contractor will be forwarded through the Owner's Representative.

12. Project Administrator – The Project Administrator is a full time representative of the Owner at the job site with authority to stop the work upon verbal order if requirements of the Contract Documents are not met, or if in the sole judgment of the Project Administrator, Owner's Representative or Owner, the interests of the Owner, safety of any person or the Owner's property are jeopardized by the work.
13. General Superintendent – This general superintendent is the Contractor's representative at the work site. This person will generally be the competent person required by OSHA in 29 CFR, Part 1926.62.

B. Definitions Pertaining to the Lead Abatement Industry (The definitions are provided for informational purposes, as applicable to these Technical Specifications; however, the disturbance of any coated surface shall not be completed as a lead abatement project.)

1. Abatement – Abatement of lead-based paint involves removal of lead-based paint or replacement of surfaces containing lead-based paint.
2. Action Level – As defined in OSHA Construction Standard 29 CFR, Part 1926.62, employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter ($30 \mu\text{g}/\text{m}^3$) of air averaged over an 8-hour period. As used in this section, “ $30 \mu\text{g}/\text{m}^3$ of air” refers to the action level.
3. Amended Water – Water containing at least one ounce of five percent (5%) trisodium phosphate per gallon of water.
4. Area Monitoring – Sampling of lead concentrations within and outside the lead control area and inside the physical boundaries which are representative of the airborne lead concentrations which may reach the breathing zone of personnel potentially exposed to lead.
5. Atomic Absorption Spectroscopy – The analytical method of determining the lead content of a given sample.
6. Physical Boundary – Area physically roped or partitioned off around a lead control area to limit unauthorized entry of personnel. As used in this section, “outside boundary” shall mean the same as “outside lead control area.”
7. Lead Inspector/Risk Assessor – As used in this section, refers to a person with a current Lead Inspector/Risk Assessor permit issued by the State of New Jersey, Department of Health.
8. Change Rooms and Shower Facilities – Rooms within the designated physical boundary around the lead control area equipped with separated storage facilities for clean protective work clothing and equipment and for street clothes which prevent cross-contamination.
9. Decontamination Area – Area for removal of contaminated personal protective equipment (PPE).
10. Eight-Hour Time Weighted Average (TWA) – Airborne concentration of lead averaged over an 8-hour workday to which an employee is exposed.
11. High Efficiency Particulate Air (HEPA) Filter Equipment – Vacuuming equipment containing a UL 586 HEPA filter system capable of preventing passage of lead contaminated paint dust with an efficiency of 99.97 percent for all particulates greater than 0.3-micron size.
12. Lead – Metallic lead, inorganic lead compounds, and organic lead soaps. Exclude from the definition are other organic lead compounds.
13. Lead Control Area – An emission control area to prevent the spread of lead dust, paint chips, or debris from lead containing paint removal operations. The lead control area is isolated by physical boundaries to prevent unauthorized entry of personnel.

14. Permissible Exposure Limit (PEL) – 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of air as an 8-hour time weighted average as determined by OSHA Construction Standard 29 CFR, Part 1926.62.
15. Personal Monitoring – Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR, Part 1926.62. Samples shall be representative of the employee’s work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of six (6) to nine (9) inches from the center at the nose or mouth of an employee.
16. Wipe Sampling – Clearance testing procedures which determine the amount of existing lead-based paint surface dust by Atomic Absorption Spectroscopy Analysis are express in micrograms of lead per square foot.

1.7 CODES & STANDARDS

- A. Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, all applicable codes, regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies are bound herewith.
- B. The Contractor shall assume full responsibility and liability for the compliance with all applicable federal, state, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State and Local regulations. The Contractor shall hold the Owner and the Owner’s Representative harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or sub-contractors.
- C. A copy of the appropriate codes and standards, as referenced herein, shall be maintained at the project site.
- D. Conflicting Requirements: Where compliance with two (2) or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents indicate otherwise. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Owner’s Representative for a decision before proceeding.
- E. Incorporation of Publications: The publications listed below form a part of this Technical Specification to the extent referenced, where applicable. The publications referred within the text will be the basic designation only.
 1. Code of Federal Regulations (CFR)
 - a. 29 CFR 1910.95 - Occupational Noise Exposure
 - b. 29 CFR 1910.134 - Respiratory Protection
 - c. 29 CFR 1910.1200 - Hazard Communication
 - d. 29 CFR 1910.1025 - Occupational Safety and Health Standards (Lead)
 - e. 29 CFR 1926.55 - Gases, Vapors, Fumes, Dusts, and Mists
 - f. 29 CFR 1926.59 - Hazard Communication

- g. 29 CFR 1926.62 - Safety and Health Regulations for Construction (Lead)
- h. 29 CFR 1926.103 - Respiratory Protection
- i. 29 CFR 1926.453 - Aerial Lifts
- j. 29 CFR 1926.502 - Fall Protection
- k. 40 CFR 260 - Hazardous Waste Management Systems (General)
- l. 40 CFR 261 - Identification and Listing of Hazardous Waste
- m. 40 CFR 262 - Generators of Hazardous Waste
- n. 40 CFR 263 - Transporters of Hazardous Waste
- o. 40 CFR 264 - Owners and Operators of Hazardous Waste Treatment, Storage and Disposal facilities
- p. 40 CFR 265 - Owners and Operators of Hazardous Waste Treatment, Storage and Disposal facilities
- q. 40 CFR 171 - Standards for Transportation of Hazardous Materials
- r. 40 CFR 172 - Hazardous Material Tables and Hazardous Materials Communications Regulations
- s. 40 CFR 173 - General Requirements for Shipments and Packaging
- t. 40 CFR 178 - Shipping Container Specifications

2. New Jersey Regulations

- a. New Jersey Administrative Code (N.J.A.C.) 5:17 – New Jersey Lead Hazard Evaluation and Abatement Code
- b. N.J.A.C. 8:62 – New Jersey Standards for Lead Certification
- c. N.J.A.C. 7:26 – New Jersey Waste Disposal Requirements
- d. N.J.A.C. 12:100-13 – New Jersey Indoor Air Quality Standard

1.8 PRE-PROJECT INSPECTION

- A. Prior to commencement of work, inspect areas in which work is to be performed. Prepare a listing of damage to structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from the work. Photograph or videotape existing conditions, as necessary to document conditions. Submit a copy of these photos or tapes to the Owner's Representative prior to starting work.

1.9 POTENTIAL ENVIRONMENTAL HAZARDS

- A. The disturbance or dislocation of paint or other coated surfaces may cause a release of lead dust, fumes, etc., within the building's atmosphere and/or the environment, thereby creating a potential health hazard to workmen, building occupants and the environment. Apprise all workers, supervisory personnel, sub-contractors, consultants and authorized visitors who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed. The building(s) may be occupied or unoccupied during all aspects of renovation/demolition.

1.10 SUBMITTALS

- A. Pre-Project/During the Work Submittals: Upon request by the Owner and/or Owner's Representative, the Contractor shall submit:

1. Written site specific Health and Safety Plan
 2. All Safety Data Sheets (SDS)
- B. Post Project Submittals: Upon completion of work on this project the Contractor shall submit the following information to the Owner, as requested:
1. Daily activity reports and personnel sign-in sheets
 2. Minutes of meetings
 3. Visitations; authorized and unauthorized
 4. Special or unusual events
- C. Waste material disposal manifests shall be submitted for project close-out payment submittal.

1.11 CONTRACTOR'S USE OF THE PREMISE

- A. The Contractor shall abide by all requirements for use of the premises at the facility. However, where not specified, the Contractor shall:
1. Confine operations, at the site, to the areas permitted under the Contract. Portions of the site beyond areas in which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.
 2. Secure and obtain facility security regulations for Contractors. All facility security requirements are incorporated by reference. No additional compensation or time shall be allotted for failure to comply with the facility's security requirements.
 3. Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times. Do not use these areas for parking or storage of materials.
 4. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary obtain and pay for such storage off site.
 5. Maintain existing building in a safe and weather tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building during the construction period.
 6. Keep public areas such as hallways, stairs, elevator lobbies and toilet rooms free from accumulation of waste, rubbish or construction debris.
 7. Smoking or open fires will not be permitted within the building enclosure or on the premises.
 8. Cooperate fully with the Owner and/or the Owner's Representative during construction operations to minimize conflicts with other Trades. Perform the work so as not to interfere with the Owner's operation.

1.12 STOP WORK

- A. If the Owner, the Owner's Representative, or the Project Administrator presents a written stop work order, immediately and automatically stop all work. Do not recommence work until authorized in writing by the Owner or his/her appropriate representative.

PART 2 – DESCRIPTION OF THE WORK

2.1 SUMMARY

- A. The intent of this Technical Specification Section is provide information and guidance for the disturbance of surface coatings where the work shall generate dust, debris and airborne particulates, that may also be coated with lead paint. Should the appropriate Trade performing the work specified that generates these conditions as a result of related renovation/demolition require the use of a Lead Abatement Contractor, licensed by the DCA, the Lead Abatement Contractor shall not be advertised as such, since the work specified in these Technical Specifications relates to the construction industry and not that of a lead hazard.
- B. Where present, turn-off and disconnect all electrical circuits inside or adjacent to the component to be removed.
- C. Existing forced air Heating, Ventilation and Air Conditioning (HVAC) systems shall be shut-down where work occurs, and protected with polyethylene sheeting to minimize the potential for dust, fumes, etc., migrating into these systems from the work area(s). The Contractor shall implement appropriate corrective measures to segregate an active system between work area(s) and adjacent occupied locations, such as “blanking;” these corrective measures shall be at no additional cost to the Owner/Project. Fresh air intakes for these systems shall be protected with two (2) layers of polyethylene sheeting, when work occurs outdoors and in proximity of such.
- D. The Contractor shall post appropriate OSHA warning signs as specified and required by 29 CFR, Part 1926.62. The Contractor shall also post appropriate notices of construction related work, as per N.J.A.C. 12:100-13, indicating potential environmental issues (i.e., dust, gases, fumes, odors, etc.) and the location of SDSs. The Contractor shall provide for clearly marked emergency means of egress for the work areas specified. These notifications shall be placed at eye level and in languages consistent with the building population.
- E. The Contractor shall be liable for all costs associated with the replacement or repair of any utilities, equipment, materials, building components, etc., that may be damaged during the course of Contractor work.

PART 3 – TREATMENT OF PAINTED SURFACES

3.1 LEAD IN CONSTRUCTION REQUIREMENTS

- A. The following is a brief summary of the Lead Exposure in Construction requirements, as per 29 CFR, Part 1926.62.
 - 1. Tasks and Trades Covered By This Rule:
 - a. General Contractors - Commercial, Residential, Highway, Street
 - b. Bridge, Tunnel & Elevated Highway
 - c. Plumbing, Painting, Electrical, Plaster, Drywall & Insulation
 - d. Carpentry

- e. Floor Layers
 - f. Roofing & Siding
 - g. Structural Steel Erection
 - h. Wrecking & Demolition
 - i. Miscellaneous Special Trades
 - j. Operators of Dwellings
 - k. Operators of State & Municipal Governments
2. Exposure Assessment: The initial step in compliance with this rule shall be to assess exposure to lead of any trade known to be, or suspected of being exposed to lead. The purpose is to determine if any employee is exposed at or above the action level. Employee exposure is that which occurs without the use of respirators. Action Level for Lead Exposure - 30 micrograms per cubic meter of air, Time Weighed Average per 8 hr. shift. Permissible Exposure Level Limit (PEL) - 50 micrograms per cubic meter of air, Time Weighed Average, per 8 hr. shift.
 3. Until the exposure assessment is complete, each affected Trade shall be treated as though exposure occurs above the PEL. Personnel samples representative of a full shift shall be collected and include at least one (1) sample for each job classification in each work area for each shift. The results of the exposure assessment will dictate the protection level to be prescribed. Positive and negative indications of exposure should be carefully documented. Additional exposure monitoring shall occur when there is a change in equipment, task, personnel, process, control or any occurrence which may result in additional or further exposure.
 4. Employees shall be notified of the results within five (5) working days from the completion of the exposure assessment. Employees found to be exposed at greater levels than the PEL shall be given written notice along with the description of corrective measures to be taken to reduce the exposure to below the PEL.
 5. Administrative Controls: If any exposure monitoring results in levels greater than the PEL, the employer shall maintain written programs and make these programs available to employees. Programs shall include: Hazardous Communications (HAZ COM), Respiratory Program in accordance with 29 CFR, Part 1910.134 (b), (d), (e) & (f), Personal Protection Program (including good housekeeping, hygiene facilities and practices, good work practices, etc.) Medical Surveillance, Record Keeping, Training, Medical Removal.
 6. Medical Surveillance: Shall include initial blood sampling for lead and zinc protoporphyrin levels. For employees who are, or may be exposed at or above the Action Level for more than 30 days in any consecutive 12 months, biological monitoring with employee notification and medical examination and consultation at least annually shall be implemented.
 7. Medical Examination shall include:
 - a. Work History & Medical History (to include past lead exposure).
 - b. Habits: (Smoking & Hygiene)
 - c. Problems with: gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems.
 - d. A thorough physical examination with attention to: teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems.
 - e. Pulmonary Status for respiratory wearers.
 - f. Blood Pressure Measurement
 - g. Hemoglobin & Hematocrit determination, red cell indices, and peripheral smear morphology.

- h. Zinc protoporphyrin
 - i. Blood urea nitrogen
 - j. Serum creatinine
 - k. Routine urinalysis with microscopic examination.
 - l. Any other test relevant to lead exposure deemed necessary by examining physician.
8. Any employee is entitled to, with proper notification to the employer, a second opinion. Should the second examination conducted differ from the first in results, the employee and employer shall negotiate a third opinion. Pregnancy testing and male fertility assessment shall be made available to employees requesting testing.
9. Training shall be on an annual basis, for each employee at or above the action level:
- a. Content of OSHA Standard
 - b. Nature of Operations
 - c. Description and purpose of Medical Surveillance, Medical Removal Programs
 - d. Health Effects of Exposure (specific to male and female)
 - e. Engineering controls and work practices
 - f. Any other Compliance Plan in Effect
 - g. Chelation
 - h. Respiratory and Personal Protection
 - i. Right to Access of Records
10. Records shall be kept for a period of 30 years. Records are transferred to the new Owner if employee ceases to do business prior to 30 years. If employer discontinues business with no new Owner, prior to 30 years, records are transferred to the Commissioner. Records shall be maintained for the following:
- a. Exposure Assessment
 - b. Exposure Monitoring
 - c. Respiratory Protection
 - d. Medical Surveillance
 - e. Medical Removals
 - f. Employee Records
11. Records shall be made available for examination and copying to:
- a. Affected Employees
 - b. Former Employees
 - c. OSHA Assistant Secretary and Director

3.2 MINIMUM SAFE WORK PRACTICES REQUIREMENTS

- A. In addition to 29 CFR, Part 1926.62, the Contractor shall implement the minimum safe work practices, as developed by the USEPA and the United States Department of Housing and Urban Development (HUD), which includes and shall apply to coatings that could contain lead and for general construction practices that produce dust, debris, airborne particulates, etc. Procedures referenced herein also incorporate those of OSHA, N.J.A.C. 5:17 and general industry practices, as applicable, for guidance.

1. Isolate all openings between the exterior work areas and building interiors and/or interior work areas and interior non-work areas, such as windows, doors, HVAC fresh air intakes, etc., with a minimum of two (2) layers of six (6) mil polyethylene sheeting secured airtight with duct tape, and where necessary, spray-glue.
2. Utilize drop cloths, consisting of two (2) layers of six (6) mil polyethylene sheeting within work areas; for exterior work areas, extend the polyethylene sheeting at least five (5) feet from the building's perimeter for exterior related work, to capture any dust, paint chips, debris, etc., generated from the work.
3. Outside work area ingress/egress points, shall have "sticky pads" placed to capture residual dust, including lead dust, from workers footwear/shoes to minimize tracking dust from outside the control area.
4. Treatment Methods for Surfaces Coated with Paint
 - a. Mist surfaces prior to wet scraping in preparation for painting and/or when components are removed for disposal or restoration.
 - i. Lightly mist the component to be removed. Do not apply water to components containing electrical circuits.
 - ii. Using a utility knife or other sharp instrument, carefully score all affected painted seams.
 - iii. Remove any screws or other fasteners.
 - iv. Using a flat pry instrument and a hammer, carefully pry the affected building component away from the surface to which it is attached. The pry bar should be inserted into the seam at the nail or other fastening device at one end of the component and prying pressure applied. This process should be repeated at each subsequent fastening location until the end of the component is reached as the component is freed.
 - v. Carefully remove or bend back all nails (or other fastening devices) and wrap removed components and nails in polyethylene sheeting and seal airtight with high quality spray-glue and duct tape.
 - vi. HEPA vacuum any dust that may have accumulated behind the component removed.
 - b. Preparation for torch cutting of components.
 - i. Perform the limited removal of lead-based paint coatings and primers, at increments of four (4) feet, to facilitate the removal of lead-based paint for the use of cutting torches on bare metal to removal sections of components.
 - ii. The limited paint removal shall expose bare metal, free of all coatings, four (4) inches out from the area to be cut.
 - iii. Limited paint removal shall be accomplished using HEPA vacuum needle guns and/or chemical paint remover.
 - iv. Utilize torches to cut through bare metal for component removal, ensuring that heat from the torch does not impact any adjacent lead-based paint.
 - c. Vacuum Water Blasting
 - i. The Contractor shall utilize the equipment in strict conformance with the Manufacturer's specifications.
 - ii. The blast head shall remain in contact with the surface at all times.

- iii. The Contractor shall implement control measures to capture and/or prevent the migration of water from outside the work area.
 - iv. Waste water generated from the project shall be containerized and undergo a Toxicity Characteristic Leachate Procedure (TCLP) test to determine the method of waste disposal (hazardous versus non-hazardous).
- d. Strippable Chemical Solvent
- i. The chemical stripper shall be troweled, brushed or spray applied. Application thickness of the material shall be determined by the sample test patches.
 - ii. The dwell-time for the paint stripper shall be determined by the evaluation of the sample test patches. Once a proper dwell time is determined, the Contractor shall remove the paint and chemical stripping compound onto the polyethylene ground cover or directly into 55-gallon drums. Any remaining residue shall then be washed down with a detergent and water to reveal the bare surface. Wash down of these surfaces is required to remove any remaining residue left by the chemical stripper. The washdown water shall be contained as specified in Section 4.0. All water and residue shall be removed by using a wet vacuum system.
 - iii. Apply paste type chemical stripper material to the existing painted surfaces by spray application, and simultaneous application of fibrous laminated cloth, where applicable.
 - iv. Remove all spent chemical stripper, fibrous laminated cloth, and old paint from the substrate manually.
 - v. Provide low pressure fresh water rinse for cleaning of the substrate to remove any visible residual of remover and old paint.
 - vi. Special care must be taken to remove chemical stripper materials before they dry or harden, to prevent damaging the surfaces being treated during the removal process. Any tools used shall be made of natural, non-abrasive materials.
 - vii. When utilizing a chemical stripper, the Contractor must determine (by contacting the Manufacturer) if the abated surface must be neutralized prior to subsequent paint application. The Contractor must also determine if neutralization of the surface is required even if the surface will remain unpainted after paint removal.
 - viii. Waste water generated from the project shall be containerized and undergo a Toxicity Characteristic Leachate Procedure (TCLP) test to determine the method of waste disposal (hazardous versus non-hazardous).
- e. HEPA Vacuum Needle Gun
- i. Maintain HEPA vacuum attachment in operation during removal operation. Select proper shroud to match the configuration of the surface being treated.
 - ii. The shroud shall remain in contact with the surface at all times.
 - iii. HEPA vacuum needle guns shall only be utilized for metal surfaces.
- f. Core Penetrations and Drilling
- i. Maintain HEPA vacuum attachment in operation during the creation of core penetrations and/or drilling through surfaces coated with paint, shellac, varnish, etc. Select proper shroud to match the configuration of the surface being

- treated and for attachment to the coring/drilling device. The shroud shall remain in contact with the surface at all times.
- ii. Alternatively, core penetrations/drilling through surfaces shall be via contact through a wet sponge over the surface or viscous foam applied to the surface where the penetrations/drilling shall occur.
 - iii. Sponges utilized for procedures referenced herein shall only be used once per penetration. Viscous foam shall be collected and surfaces where the foam has potentially run along the surface due to gravity or residual shall be wet-wiped clean. All sponges, foam and cloths/rags used for wet-wiping off foam from surfaces shall be included with the waste stream for TCLP testing to determine if the waste is hazardous or non-hazardous.
5. Utilize High Efficiency Particulate Air (HEPA) filter equipped vacuums to clean surfaces at the completion of the require work and to extract dust/debris from polyethylene sheeting used for isolation and/or as drop cloths.
 6. Roll polyethylene sheeting drop cloths inward after misting with water prior to disposal.
 7. Wet-mop/wipe all horizontal surfaces within proximity to the work area, both inside and outside the building, depending on the work area location, with a trisodium phosphate (TSP) in water solution. Follow the Manufacturer's recommendations for dilution ratio. Prior to and after wet-mopping/wiping, HEPA vacuum all horizontal surfaces, accounting for drying time from wet-mopping/wiping.
 8. Utilize personal protection equipment as required by 29 CFR, Part 1926.62. Remove protective clothing on "sticky pads," and have waste bags in proximity to this area to place disposable protective equipment.
 9. Coordinate with the Owner and/or Owner's Representative for a restroom that can be dedicated to workers for hygiene purposes, inclusive of washing hands, arms, face, etc., at the completion of each shift. These restrooms shall be HEPA vacuumed, wet-wiped clean and HEPA-vacuumed at the end of each work shift, to remove all visible dust and debris from floors, sinks, urinals, toilets, etc.
 10. All disposable items, including mop heads, rags, personal protection equipment, etc., shall be treated as referenced in these Technical Specifications.

3.3 MINIMUM NEW JERSEY AIR QUALITY REQUIREMENTS

- A. Where general ventilation is inadequate to control air contaminants emitted from point sources within work spaces to below the Permissible Exposure Limit, such as that outlined above for lead by OSHA, other control measures shall be implemented, such as, but not limited to, negative pressure filtration equipment or an equivalent substitution.
- B. Renovation/demolition work that creates dust and particulates, gases, or other harmful substances in quantities hazardous to health shall be controlled by local ventilation or other protective measures for worker/occupant safety.
- C. Renovation activities in occupied buildings shall be isolated, so as to confine contaminants, dust and debris within the work area. Means of isolation include, but are not limited to, physical barriers (hard construction and/or polyethylene sheeting), work area negative pressure differentials, completing work during minimal periods of occupancy, etc.
- D. Prior to re-occupancy, work areas shall be cleaned and ventilated, as necessary.

- E. Occupants/Trades shall be notified at least 24-hours prior, or promptly for emergencies, of work to be performed on the building that may introduce air contaminants.

3.4 WORKER SAFETY

- A. The Contractor is responsible for ensuring all appropriate worker protection regulations are followed, inclusive of those of OSHA, Corporate policies and procedures, the project job site requirements, etc. Project job site requirements shall be provided to the Contractor upon Contract Award, or the day the project commences. Provision herein apply to all Trade related work.
- B. Enforcement of the Contractor's on-site staff to comply with Health and Safety Compliance shall be the sole responsibility of the Contractor's supervisory personnel. The Owner's Representative, the Owner and the Owner's consultants/professional services, shall not be liable for the Contractor's non-compliance with Health and Safety requirements. The exception shall be when the Contractor's actions pose a potential health and safety risk to the Owner and its personnel and/or clients, and/or the Owner's Representative. The exception shall also apply for failure for the Contractor to comply with site rules and regulations. If such a risk occurs, the Owner, Facility and/or Owner's Representative shall Stop Work immediately to rectify the situation.
- C. At a minimum, the Contractor shall ensure the following, which includes provisions within these Technical Specifications.
 - 1. Respiratory Protection Program: Furnish each employee with a half face negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 12 months thereafter, as required by 29 CFR, Part 1926.62, 29 CFR, Part 1926.103, and 29 CFR, Part 1910.134. Establish and implement a respiratory protection program. Upon completion of the initial employee exposure assessment, adjust respiratory protection as required by 29 CFR, Part 1926.62.
 - 2. Hazard Communication Program: The Contractor shall establish and implement a Hazard Communication Program as required by 29 CFR, Part 1926.59, and 29 CFR, Part 1910.1200.
 - 3. Change Areas and Shower Facilities: Provide clean change areas within the physical boundary around the designated Lead Control Area. Upon completion of initial employee exposure assessment, adjust requirements in accordance with 29 CFR, Part 1926.62.
 - 4. Personnel Protection: Personnel shall wear and use protective clothing and equipment, such as respirators, protection suits, eye protection, hard hats, appropriate foot and hand protection, etc. Eating, smoking, or drinking is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been given appropriate training and protective equipment.
 - 5. It is anticipated that the Contractor will be utilizing power tools. The Contractor shall ensure compliance with the requirements of a hearing protection and conservation, as outlined in 29 CFR, Part 1910.95.
- D. Safety and Health Compliance: In addition to the detailed requirements of this Specification, comply with laws, ordinances, rules and regulations of federal, state and local authorities regarding removing, handling, storing, transporting and disposing of lead waste materials. Comply with applicable requirements of the current issue of 29 CFR, Part 1910.1025. Submit

matters regarding interpretation of standards to the owners for resolution before starting work. Where specification requirements and referenced documents vary, the most stringent requirement shall apply.

3.5 ADDITIONAL REQUIREMENTS

- A. Construction work shall not generate visible emissions, as required by 40 CFR, Part 61, the National Emissions Standard for Hazardous Air Pollutants (NESHAP).

PART 4 – WASTE HANDLING AND DISPOSAL

4.1 HAZARDOUS WASTE MANAGEMENT PLAN

- A. The Hazardous Waste Management Plan shall comply with applicable requirements of federal, state and local hazardous waste regulations and addresses the following:
 - 1. Identification of hazardous wastes associated with the work as defined in 40 CFR, Part 261.
 - 2. Estimated quantities of wastes to be generated and disposed of.
 - 3. Names and qualifications of each Contractor that will be transporting, storing, treating and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of USEPA, state and local hazardous waste permit applications, permits and USEPA identification numbers.
 - 4. Names and qualifications (experience and training) of personnel who will be responsible for onsite management of hazardous wastes.
 - 5. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.
 - 6. Spill prevention, containment, and clean-up contingency measures to be implemented.
 - 7. Work plan and schedule for waste containment, removal and disposal. Hazardous wastes shall be collected and containerized daily.
 - 8. A locked dumpster or covered truck provided by the Contractor shall be used to store hazardous debris prior to removal at the conclusion of the job.

4.2 WASTE REQUIREMENTS

- A. Waste storage on-site, transportation and disposal shall comply with all applicable waste regulations, which include, but are not limited to, the federal USEPA, DOT and the State of New Jersey waste regulations.
- B. Collect a sample of the lead containing waste to determine if it is at or above the toxicity characteristic limit which classifies the waste as hazardous waste, defined as five (5) milligrams per liter (mg/L) lead concentration (USEPA regulation 40 CFR, Part 261.24). TCLP samples shall be analyzed via Test Method 1311 in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, USEPA publications SW-846.
- C. If the waste classifies as a hazardous waste (i.e., greater than or equal to 5 milligrams per liter of lead concentration), the Contractor shall follow and implement all applicable hazardous waste

regulations for the storage, labeling, transportation and disposal of the waste material. This includes, but is not limited to:

1. Labeling of the hazardous waste containers with the words “hazardous waste” and the waste accumulation date; the waste generator name and address.
2. The proper completion of the hazardous waste manifest for the off-site shipment.
3. Storage of the waste materials in USDOT approved containers.
4. Use of a licensed waste transporter and a treatment, storage and disposal facility (TSDF) authorized to accept the waste.

PART 5 – OWNER DIRECTED TESTING AND ANALYSIS

5.1 OWNER TESTING OPTIONS

- A. Testing for lead can be conducted by the Owner at any time during the Contractor’s activities and may contain but not be limited to air, wipe and soil sampling and analysis. Samples obtained will be compared to the most stringent Federal, State and Local standards as applicable.
- B. The Contractor shall be responsible for any and all testing and analysis as indicated in the standards noted in this Section. The Owner may, at its discretion, mirror testing and analysis being conducted by the Contractor.
- C. If lead contamination is discovered related to the Contractor’s activities, the Contractor shall rectify the contaminant issue by cleaning the area until satisfactory lead wipe or soil results are achieved (per HUD and N.J.A.C. 5:17 clearance criteria) at no additional cost to the Owner. The Contractor shall be responsible for the costs associated with the cleaning in addition to the costs associated with the Owner’s Representative.

5.2 SAMPLING COMPLIANCE

- A. Post Renovation Clearance Sampling
 1. At the Owner’s discretion, the Owner’s Representative may conduct post clearance sampling in accordance with Method SW-846-7000B. All laboratories which analyze samples shall be USEPA recognized, AIHA-LAP, LLC, Environmental Lead Laboratory Accreditation Program (ELLAP) accredited.
 2. Acceptable clearance sampling results shall be less than the HUD and N.J.A.C. 5:17 clearance criteria as follows:
 - a. Wipe Sample results collected inside the work area shall be less than the following micrograms per square foot ($\mu\text{g}/\text{sf}^2$):

i.	Floors	40 $\mu\text{g}/\text{sf}^2$
ii.	Interior Window Sills	250 $\mu\text{g}/\text{sf}^2$
iii.	Window Troughs	400 $\mu\text{g}/\text{sf}^2$

b. Soil Sample taken at the exterior of the work site shall be less than the following micrograms per gram ($\mu\text{g/g}$):

- i. Bare Soil 400 $\mu\text{g/g}$

END OF SECTION 028300

SECTION 028400 – NON-LIQUID POLYCHLORIANATED BIPHENYLS MATERIAL REMOVAL

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. This renovation Project will include the removal and disposal of non-liquid polychlorinated biphenyls (PCB) at the State Office Building, 135 West Hanover Street, Trenton, Mercer County, New Jersey.
- B. The work shall include but not be limited to the removal of the following.

Location	Material Description	Quantity
Exterior, Basement Window Well Grate Cover	Caulk/Sealant at Grate	16 Linear Feet

- C. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all work to be performed. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the work.
- D. All work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent shall apply.
- E. Working hours shall be as required and approved by the Owner. PCB material removal activities including, but not limited to, work area preparation, gross removal activities, cleaning activities, waste removal, etc. may need to be performed during ‘off-hours’ (including nights and weekends). In addition, multiple mobilizations may be required to perform the work identified in this project. The Contractor shall coordinate and schedule all Work with the facility and Owner’s representative.

1.2 PERMITS AND COMPLIANCE

- A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to work practices, protection of workers, authorized visitors to the site, persons, and property adjacent to the work.
- B. Perform PCB related work in accordance with 40 CFR 761, and 29 CFR 1926, as specified herein. Where more stringent requirements are specified, adhere to the more stringent requirements.
- C. The Contractor must maintain current licenses or registrations pursuant to EPA regulations for all Work related to this Project, including the removal, handling, transport, and disposal of hazardous and industrial waste.
- D. The Contractor shall be prepared to obtain an EPA ID number if so directed by the Owner.
- E. Failure to adhere to the Project Documents shall constitute a breach of the Contract and the Owner shall have the right to and may terminate the Contract provided, however, the failure of the Owner to so terminate shall not relieve the Contractor from future compliance.

1.3 SUBMITTALS

A. Pre-Work Submittals:

1. Abatement Work Plan: Provide plans that clearly indicate the following:
 - a. All Work Areas/containments numbered sequentially.
 - b. Entrances and exits to the Work Areas/containments.
 - c. Type of abatement activity/technique for each Work Area/containment.
 - d. Proposed location and construction of storage facilities and field office.
2. Disposal Site/Landfill Permit from applicable regulatory agency.
3. Letter identifying the presence of PCB bulk product waste, with Acknowledgement by the landfill. See section 4.1.A

B. On-Site Submittals: Refer to Part 3.1.B for all submittals, documentation, and postings required to be maintained on-site during abatement activities.

C. Project Close-out Submittals:

1. Copy of all waste disposal manifests and disposal logs. Original waste manifests shall be sent to the A/E with the closeout submittals.
2. Daily progress log.
3. Copy of Contractor's Acknowledgment Statement Forms.
4. Copy of PCB notification with acknowledgement from the disposal facility/landfill, if applicable.

1.4 PRE-CONSTRUCTION CONFERENCE

A. Prior to start of preparatory Work under this Contract, the Contractor shall attend a pre-construction conference attended by Owner, Facility Personnel, and Environmental Consultant.

B. Agenda for this conference shall include but not necessarily be limited to:

1. Contractor's scope of Work, Work plan, and schedule to include number of workers and shifts.
2. Contractor's safety and health precautions including protective clothing and equipment and decontamination procedures.
3. Environmental Consultant's duties, functions, and authority.
4. Contractor's Work procedures including:
 - a. Methods of job site preparation and removal methods.
 - b. Disposal procedures.

- c. Cleanup procedures.
 - d. Fire exits and emergency procedures.
5. Contractor's required pre-work and on-site submittals, documentation, and postings.
 6. Contractor's plan for twenty-four (24) hour Project security both for prevention of theft and for barring entry of unauthorized personnel into Work Areas.
 7. Temporary utilities.
 8. Handling of furniture and other moveable objects.
 9. Storage of removed PCB materials.
 10. Waste disposal requirements and procedures.
- C. In conjunction with the conference the Contractor shall accompany the Owner and Environmental Consultant on a pre-construction walk-through documenting existing condition of finishes and furnishings, reviewing overall Work plan, location of fire exits, fire protection equipment, water supply and temporary electric tie-in.

1.5 APPLICABLE STANDARDS AND REGULATIONS

- A. The Contractor shall comply with the following codes and standards, except where more stringent requirements are shown or specified:
- B. Federal Regulations:
1. 29 CFR 1910.1200, "Hazard Communication" (OSHA)
 2. 29 CFR 1910.134, "Respiratory Protection" (OSHA)
 3. 29 CFR 1910.145, "Specification for Accident Prevention Signs and Tags" (OSHA)
 4. 29 CFR 1926, "Construction Industry" (OSHA)
 5. 29 CFR 1926.500 "Guardrails, Handrails and Covers" (OSHA)
 6. 40 CFR 761, "PART 761—POLYCHLORINATED BIPHENYLS (PCBs)" (EPA)
 7. 49 CFR 171-173, Transportation Standards (DOT)
- D. Standards and Guidance Documents:
1. American National Standard Institute (ANSI) Z88.2-80, Practices for Respiratory Protection

1.6 PROJECT MONITORING

- A. The Owner shall engage the services of an Environmental Consultant (the Consultant) who shall serve as the Owner's Representative in regard to the performance of the PCB abatement Project and provide direction as required throughout the entire abatement Project period.
- B. The Contractor is required to ensure cooperation of its personnel with the Consultant for the sampling and Project monitoring functions described in this section. The Contractor shall comply with all direction given by the Consultant during the course of the Project.
- C. The Consultant shall provide the following administrative services:
 - 1. Review and approve or disapprove all submittals, shop drawings, schedules, and samples.
 - 2. Assure that all notifications to governmental agencies or landfills by the Contractor are submitted in a timely manner and are correct in content.
 - 3. Review and approve the Contractor's compliance testing laboratory.
- D. The Consultant shall staff the Project with a trained and certified person(s) to act on the Owner's behalf at the job site. This individual shall be designated as the Abatement Project Monitor (APM).
 - 1. The APM shall be on-site at all times the Contractor is on-site. The Contractor shall not be permitted to conduct any Work unless the APM is on-site (except for inspection and planning purposes during non-working days).
 - 2. The APM shall have the authority to direct the actions of the Contractor verbally and in writing to ensure compliance with the Project documents and all regulations. The APM shall have the authority to Stop Work when gross Work practice deficiencies or unsafe practices are observed.
 - a. Such Stop Work order shall be effective immediately and remain in effect until corrective measures have been taken and the situation has been corrected.
 - b. Standby time required to resolve the situation shall be at the Contractor's expense.
 - 3. The APM shall provide the following services:
 - a. Inspection of the Contractor's Work, practices, and procedures, including temporary protection requirements, for compliance with all regulations and Project specifications.
 - b. Monitor the progress of the Contractor's Work, and report any deviations from the schedule to the Owner.
 - c. Monitor, verify, and document all waste load-out operations.
 - d. The APM shall maintain a log on site that documents all project related and Consultant and Contractor actions, activities, and occurrences.
 - e. The APM shall take air, swipe, wipe, or bulk samples upon the Owner's request.
 - 4. The following inspections shall be conducted by the APM. Additional inspections shall be conducted as required by Project conditions. Progression from one phase of Work to the next by the Contractor is only permitted with the written approval of the APM.
 - a. Pre-Construction Inspection: The purpose of this inspection is to verify the existing conditions of the Work Areas and to document these conditions.

- b. Pre-Commencement Inspection: This inspection shall take place only after the Work Area is fully prepped for removal.
 - c. Work Inspections: The purpose of this inspection is to monitor the Work practices and procedures employed on the Project and to monitor the continued integrity of the containment system. Inspections within the removal areas shall be conducted by the APM during all preparation, removal, and cleaning activities at least twice every Work shift. Additional inspections shall be conducted as warranted.
 - d. Visual Clearance Inspection: The purpose of this inspection is to verify that: all materials in the scope of work have been properly removed; no visible PCB material debris/residue remains.
 - e. Punch List Inspection: The purpose of this inspection is to verify the Contractor's certification that all Work has been completed as contracted and the existing condition of the area prior to its release to the Owner.
5. The Owner may, at his discretion, choose to conduct air sampling. If air samples collected during abatement indicate any airborne PCB concentration(s) above the OSHA PEL of 0.5 mg/m³ or EPA recommended thresholds, work shall be stopped immediately and Work methods shall be altered to reduce the airborne PCB concentration(s).

1.7 PROJECT SUPERVISOR

- A. The Contractor shall designate a full-time Project Supervisor who shall meet the following qualifications:
 3. The Project Supervisor shall be trained in PCB removal and hazardous waste management, via a 40-hour HAZWOPER/Supervisor training course.
 4. The Project Supervisor shall have a minimum of one year experience as a supervisor.
 5. The Project Supervisor must be able to read and write English fluently, as well as communicate in the primary language of the Workers.
- B. If the Project Supervisor is not on-site at any time whatsoever, all Work shall be stopped. The Project Supervisor shall remain on-site until the Project is complete. The Project Supervisor cannot be removed from the Project without the written consent of the Owner and the Environmental Consultant. The Project Supervisor shall be removed from the Project if so requested by the Owner.
- C. The Project Supervisor shall maintain a bound Daily Project Log.
- D. The Project Supervisor shall be responsible for the performance of the Work and shall represent the Contractor in all respects at the Project site. The Supervisor shall be the primary point of contact for the APM.

1.9 TRAINING

- A. As required by applicable regulations, prior to assignment to PCB Work instruct each employee with regard to the hazards of PCB, safety and health precautions, and the use and requirements of protective clothing and equipment.

1.10 RESPIRATORY PROTECTION

- A. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134. Provide respirator training.
- B. Select respirators from those approved by the Mine Safety and Health Administration (MSHA), and the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134.
- C. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist on a yearly basis. Fit-tested respirators shall be permanently marked to identify the individual fitted, and use shall be limited to that individual.
- D. The Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the work day.
- E. Any authorized visitor, Worker, or supervisor found in the Work Area not wearing the required respiratory protection shall be removed from the Project site and not be permitted to return.

1.11 DELIVERY AND STORAGE

- A. Deliver all materials to the job site in original packages with containers bearing manufacturer's name and label.
- B. Store all materials at the job site in a suitable and designated area.
 - 1. Store materials subject to deterioration or damage away from wet or damp surfaces and under cover.
 - 2. Protect materials from unintended contamination and theft.
 - 3. Storage areas shall be kept clean and organized.
- C. Remove damaged or deteriorated materials from the job site. Materials contaminated with PCB shall be disposed of as PCB material as specified herein.

1.12 TEMPORARY UTILITIES

- A. Where available, obtain power from Owner's existing system. Otherwise provide power from other sources (i.e. generator).
 - 1. Provide temporary wiring and "weatherproof" receptacles in sufficient quantity and location to serve all HEPA equipment and tools.
 - 2. Provide wiring and receptacles as required by the Environmental Consultant for air sampling equipment.
- B. Provide temporary lighting for all Work Areas.
 - 1. The entire Work Area shall be kept illuminated at all times.

2. Provide lighting as required by the Environmental Consultant for the purposes of performing required inspections.
- C. Utilize domestic water service, if available, from Owner's existing system.

PART 2 – PRODUCTS

2.1 PROTECTIVE CLOTHING

- A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, and foot coverings. Provide disposable plastic or rubber gloves, suitable to prevent PCB skin contact, to protect hands.
- B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing abatement Work.
- C. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.
- D. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Work Area.

2.2 SIGNS AND LABELS, CONTAINERS

- A. Provide warning signs and barrier tapes at all approaches to PCB Work Areas. Locate signs at such distance that personnel may read the sign and take the necessary protective steps required before entering the area.
- B. Provide the appropriate “Large PCB Marking” or “Small PCB Marking” (M_L or M_S per 40 CFR 761) as shown below, of sufficient size to be clearly legible, for display on waste containers (bags, boxes, rolloffs or drums) which will be used to contain or transport PCB contaminated material, in accordance with 40 CFR 761. In addition, U.S. Department of Transportation (DOT) 49 CFR Parts 171 and 172 requires the name and UN number of the material to be on the bags or drums, and, if shipped in bulk (rolloffs, Gaylord boxes, etc) the bulk container must also be labeled: Polychlorinated biphenyl, solid mixture UN 3432.



M_L



M_S

- C. Provide 6 mil plastic disposal bags with PCB caution labels.
 - 1. The “Small PCB Label” (M_S per 40 CFR 761) may be used as shown above. Bags shall also be labeled with U.S. DOT required markings per 49 CFR 172, Polychlorinated biphenyl, solid mixture UN 3432.
 - 2. Labeled PCB waste containers or bags shall not be used for non-PCB waste or trash. Any material placed in labeled containers or bags, whether turned inside out or not shall be handled and disposed of as PCB waste.

2.3 DAILY PROJECT LOG

- A. Provide a Daily Project Log. The log shall contain on title page the Project name, name, address and phone number of Owner; name, address and phone number of Environmental Consultant; name, address and phone number of Abatement Contractor; emergency numbers including, but not limited to local Fire/Rescue department.
- B. All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted.
- C. The Project Supervisor shall document all Work performed daily and note all inspections.

2.4 SCAFFOLDING AND LADDERS

- A. Provide all scaffolding and/or staging as necessary to accomplish the Work of this Contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding and ladders shall comply with all applicable OSHA construction industry standards.
- B. Provide scaffolding and ladders as required by the Environmental Consultant for the purposes of performing required inspections.

2.5 SHIPPING CONTAINERS AND PACKAGING

- A. Provide packaging in accordance with 49 CFR 173 Packaging Group 9, such as 30 or 55 gallon capacity fiber, plastic, or metal drums, Gaylord Boxes or other Intermediate Bulk Containers (IBCs), or non-siftable bulk containers, capable of being sealed air and water tight if PCB waste has the potential to damage or puncture disposal bags. Affix PCB caution labels on lids of drums, and opposite sides of drums or bulk containers, as well as the ends of bulk containers.

2.6 EQUIPMENT AND MATERIALS

- A. All dry vacuuming performed under this contract shall be performed with High Efficiency Particulate Air (HEPA) filter equipped industrial vacuums conforming to ANSI Z9.2.
- B. Any power tools used to drill, cut into, or otherwise disturb PCB material shall be manufacturer equipped with HEPA filtered local exhaust ventilation.
- C. All polyethylene (plastic) sheeting used on the Project (including but not limited to sheeting used for critical and isolation barriers, fixed objects, walls, floors, ceilings, waste container) shall be at least 6 mil fire retardant sheeting.

PART 3 – EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Should visible PCB debris be observed outside the Work Area, immediately stop Work notify the Owner; institute emergency procedures as directed. All costs incurred in decontaminating such non-Work Areas and the contents thereof shall be borne by the Contractor, at no additional cost to the Owner.
- B. The following submittals, documentation, and postings shall be maintained on-site by the Contractor during abatement activities at a location approved by the Abatement Project Monitor:
 - 1. Project documents (specifications and drawings.)
 - 2. Applicable regulations.
 - 3. Material Safety Data Sheets of supplies/chemicals used on the Project.
 - 4. Approved Abatement Work Plan.
 - 5. List of emergency telephone numbers.
 - 6. Waste Disposal Log.
 - 7. Daily Project Log.

- C. The following documentation shall be maintained on-site by the Abatement Project Monitor during abatement activities:

- 1. Project Monitor Daily Log.

3.2 WORK AREA PREPARATION

- A. PCB caution signs shall be posted at all approaches to the PCB Work Area. Post all emergency exits as emergency exits only on the Work Area side, post with PCB caution signs on the non-Work Area side. Provide all non-Work Area stairs and corridors accessible to the PCB Work Area with warning tapes at the base of stairs and beginning of corridors. Warning tapes shall be in addition to caution signs.
- B. Access to areas of work shall be regulated to prevent unauthorized visitors.
- C. Personal/Equipment Decontamination Room or Area. An existing room or area that is adjacent to the work area shall be used for the decontamination of personnel and equipment. The room or area shall be covered by an impermeable dropcloth on the floor or horizontal working surface. The room or area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment. Work clothing must be cleaned with a HEPA vacuum before it is removed. All equipment and surfaces of waste containers must be cleaned prior to removing them from the decontamination room or area. All personnel must enter and exit the PCB work area through the decontamination room or area.
- D. Work Area Preparation For Exterior Removal:
 - 1. All ground surfaces exterior to the work area shall have a layer of 6 mil fire retardant plastic sheeting, attached to the building face and laid down on the surface below the exterior abatement work area, at least 10 feet wide or to the furthest point of gravity fall for dislodged debris by methods used, whichever is further. For work at the second story and above, extend 6 mil fire retardant plastic sheeting as necessary. For work above third story, by sidewalk, street, or property boundary, scaffolding sides shall be covered in 6-mil fire retardant plastic sheeting.
 - 2. All operable windows within the work area and 25 ft. from all sides of the work area shall be closed.
 - 3. In the work area, isolate all HVAC equipment intakes by temporarily shutting down units during removals and installing plastic sheeting over the opening.

3.3 REMOVAL OF PCB MATERIALS - GENERAL

- A. PCB-containing materials shall be removed in accordance with the Contract Documents and the approved PCB Work Plan.
- B. Non-PCB items remaining such as windows, doors, masonry, and all other building construction and components from which PCB materials are removed shall be decontaminated by physical or chemical means (such as stripper) such that no visible residue remains. The removal of the PCB materials may require the use of scrapers,

solvents, mastic removal chemicals, or other methods/procedures to ensure complete removal.

- C. Use tools that generate the least amount of dust and will still complete the PCB caulk removal. See current EPA regulations and recommendations regarding tools and protective measures to be used for PCB caulk removals.
- D. Grinding electromechanical tools (e.g. angle grinders, masonry groove cutters, circular saws, and slot mills, etc.) are not allowed to be used for exterior open-air PCB caulk removals.
- E. For exterior removals, take appropriate precautions (e.g. install windscreens) to prevent dust and debris from migrating due to windy conditions.
- F. Remove accessible caulk that could be disturbed before cutting building components, such as window frames.
- G. All removed PCB material shall be placed into 6 mil plastic disposal bags or other suitable container upon detachment from the substrate. Large components with PCB material or PCB residue shall be wrapped in one layer of 6 mil plastic sheeting. Sharp components likely to tear disposal bags shall be placed in fiber drums or boxes and then wrapped with sheeting.
- H. Power or pressure washers are not permitted for PCB removal or clean-up procedures
- I. All construction and demolition debris determined by the Environmental Consultant to be contaminated with PCB shall be handled and disposed of as PCB waste. If non-porous (e.g. metal) removed components previously in contact with non-liquid PCBs are to be cleaned and decontaminated prior to disposal as non-PCB waste, the requirements of 40 CFR 761 Subpart D shall be met, including cleaning to Visual Standard No. 2, Near-White Blast Cleaned Surface Finish of the National Association of Corrosion Engineers (NACE). The APM shall verify compliance with Standard No. 2, by visually inspecting all cleaned removed components. The Contractor shall note that a near-white metal blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter.
- J. All PCB waste must be located at or near the point of generation, under the control of the Project Supervisor.
- K. The Contractor is required to provide temporary protection of the building (i.e. roof, window openings, construction joints, etc.) at the end of each Work shift so as to maintain the building in a watertight condition.
- L. Personal protective equipment, including respirators, shall be utilized and worn during all removal operations until the Work Area is cleared by the APM.
- M. Following completion of gross abatement and after all accumulations of PCB waste materials have been containerized, the decontamination procedures in Section 3.4 shall be followed.
- N. Finishes damaged by PCB abatement activities shall be restored prior to final payment. Finishes unable to be restored shall be replaced under this Contract.

- O. Dry sweeping and any other methods that raise dust shall be prohibited.

3.4 EQUIPMENT AND AREA DECONTAMINATION

- A. When removal of PCB materials is completed, the decontamination process shall consist of vacuuming (with a HEPA filter), wet wiping/mopping and a repeated vacuuming (with a HEPA filter) of the entire work area. All surfaces in and around the work area must be free of dust generated during the work.
- B. Decontaminate all tools and equipment before removal from the work area.
- C. If dust or debris has migrated to areas of the building other than the immediate work area, those areas shall be incorporated into the work area and thoroughly decontaminated to ensure all visible dust generated by the activity is eliminated.
- D. Uncontaminated dust barriers and other protective sheeting shall be placed in disposable construction bags and disposed of as normal trash.
- E. Visually inspect the area for any remaining dust or debris. Vacuum (with HEPA filter) and wet wipe until space is clean. Dispose of vacuum contents as PCB waste.
- F. Upon completion of decontamination and removing temporary dust barriers, a final inspection shall be performed by the Contractor and Abatement Project Monitor. As a result of any visual inspection by the Abatement Project Monitor, the Contractor will clean or reclean the affected areas at no additional expense to the Owner.

PART 4 – DISPOSAL OF PCB WASTE

4.1 TRANSPORTATION AND DISPOSAL SITE

- A. The Contractor's Hauler and Disposal Site shall be approved by the Owner. For any permitted out-of-state landfill not specifically authorized for disposal of PCBs, written notice must be provided 15 days prior to the first shipment of the same waste stream that the waste may contain PCBs greater than 50ppm, in accordance with 40 CFR 761.62. The letter shall be acknowledged via a disposal facility representative's signature, printed name and title. If the facility is permitted to accept PCB waste, no letter is required.
- B. The Contractor shall give twenty-four (24) hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal working hours unless otherwise specified. No waste may be taken from the site unless the Contractor and Environmental Consultant are present and the Environmental Consultant authorizes the release of the waste as described herein.
- C. All waste generated as part of the PCB project shall be removed from the site within ten (10) calendar days after successful completion of all PCB abatement work.

- D. Upon arrival at the Project Site, the Hauler must possess and present to the Environmental Consultant a Waste Hauler's Permit. The Environmental Consultant may verify the authenticity of the hauler's permit with the proper authority.
- E. The Hauler, with the Contractor and the Environmental Consultant, shall inspect all material in the transport container prior to taking possession and signing the Hazardous Waste Manifests.

4.2 WASTE STORAGE CONTAINERS

- A. All waste containers shall be fully enclosed and lockable (i.e. enclosed dumpster, trailer, etc.).
- B. The container shall be plasticized and sealed with one layer of 6 mil plastic. Once on site, it shall be kept locked at all times, except during load out. The waste container shall not be used for storage of equipment or contractor supplies.
- C. While on-site, the container shall be labeled with PCB Warning Labels as specified in Section 2.2.
- D. The container is not permitted to be loaded unless it is properly plasticized, has the appropriate danger signage affixed, and has the permit number appropriately stenciled on the container.
- E. The Owner may initiate random checks at the Disposal Site to insure that the procedures outlined herein are complied with.

4.3 HAZARDOUS WASTE MANIFESTS

- A. The Manifest shall be completed by the Contractor and verified by the Environmental Consultant that all the information and amounts are accurate and the proper signatures are in place.
- B. The Manifest shall have the appropriate signatures of the Owner's Representative (the Generator) and the Hauler representative prior to any waste being removed from the site.
- C. Copies of the completed Manifest shall be retained by the Environmental Consultant and shall remain on site for inspection.
- D. Upon arrival at the Disposal Site, the Manifest shall be signed by the Disposal Facility operator to certify receipt of PCB materials covered by the manifest.
- E. The Disposal Facility operator shall return the original Manifest to the Owner's Representative (the Generator) within 45 days.
- F. Originals of all waste disposal manifests disposal logs shall be submitted by the Contractor to the Owner with the final close-out documentation.

END OF SECTION 028400

SECTION 040120 - MAINTENANCE OF UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes unit masonry assemblies consisting of the following:
 - 1. Face brick; new, repair, replacement, restoration and repointing.
 - 2. Mortar.
 - 3. Terracotta repair, restoration and repointing.
 - 5. Miscellaneous masonry accessories.
 - 6. Masonry joint reinforcement.

1.3 SUBMITTALS

- A. Provide samples of proposed matching mortar for Architect's and State's review and approval prior to continuing masonry work. Contractor must not proceed with work until the State has reviewed and approved sample. For the following:
 - 1. Face brick; in the form of straps of five or more bricks.
 - 2. Terracotta; to match existing size, profile and color.
 - 3. Mortar; to match original in constituent composition, hardness, texture, color and workmanship.
 - a. Contractor shall be required to hire a testing agency to provide testing of twelve (12) existing samples of mortar to identify the existing composition.
- B. Mix Designs: For each type of mortar, grout, and parage. Include description of type and proportions of ingredients.
 - 1. Include test reports, per ASTM C 780, for mortar mixes required to comply with property specification.
- C. Provide sample panel 2' high by approximately 3' wide illustrating masonry repair, including tinted mortar patching, and mortar appearance and tooling for approval by Architect and the State. Contractor must not proceed with work until the State has reviewed and approved the sample. Sample may be part of overall repairs.

1. Number of sample panels required: One (1) for each material repair (brick and terracotta), and one (1) for sample crack repairs.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, DPMC Prequalified, and qualified according to ASTM C 1093 for testing indicated, as documented according to ASTM E 548.
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer, who has product that has been in similar use for three years, for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.
- D. Installers: Installers shall have five years experience with similar work.
- E. All masonry work shall be in conformance with American Building Standard Code Requirements for Masonry, ASA 41.1, and NCMA current specification.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.3 BRICK

- A. General: Provide Sizes and shapes to match existing.
- B. Face Brick: ASTM C 216, Grade SW, Type FBS.
 1. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
 2. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
 3. Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing per ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet.
 4. Size: to match existing size - 2 1/8 x 3 3/4 x 8 1/4.
 5. Application: Use where brick is exposed, unless otherwise indicated.
 6. Provide face brick matching color range, texture, and size of existing adjacent brickwork. Obtain from a single source.
 7. Products:
 - a. Carolina Ceramics
 - b. Glen Gary Brick
 - c. Hudson Brick
 - d. or approved equal.
- C. Building brick, if required for the work, shall be solid clay units, Grade NW, ASTM C 62, size, texture and color as selected or to match existing.
- D. Terracotta: Match existing.

2.4 INITIAL MASONRY CLEANING

- A. Only potable water and natural bristle or nylon brushes may be utilized for cleaning..
- B. After tooling, remove mortar from edges of joints.

- C. No chemicals may be utilized.

2.5 MORTAR MIXES

- A.. Mortar mix proportions shall be in accordance with mortar analysis to be performed by the Contractor's Testing Agency. Color and texture of mortar shall match that of existing adjacent mortar.

2.6 REINFORCEMENT

- A. Masonry Joint Reinforcement, General: ASTM A 951.
 - 1. Exterior Walls: Hot-dip galvanized, carbon steel.
 - 3. Wire Size for Reinforcement: W1.7 or 0.148-inch diameter.
 - 4. Spacing of Reinforcement: Continuous horizontally and 8" vertically.
 - 5. Provide in lengths of not less than 10 feet.
- B. Masonry Joint Reinforcement for Masonry: Either ladder or truss type with single pair of side rods.

2.7 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in subsequent paragraphs that are made from materials that comply with subparagraphs below, unless otherwise indicated.
- B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.

2.8 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

2.9 ACCESSORY MATERIALS

- A. Setting Buttons and shims: Resilient plastic: nonstaining to brick and terracotta, sized to suit joint thickness and bed depths, less the required depth for pointing materials unless removed before pointing.
- B. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 - 1. Previous effectiveness in performing the work involved.

2. Minimal possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could leave residue on surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
 1. No work in this section shall be executed when the ambient temperature is less than 40 degrees F and rising or 45 degrees F and falling, or higher than 80 degrees F.
 2. No pointing shall be executed when freezing temperatures are expected within 48 hours.
 3. No additives shall be used to extend these acceptable temperature ranges.
 4. Heat materials and provide temporary protection of completed portions of the work in accordance with the governing code and with "Construction and Protection Recommendations for Cold Weather Masonry Construction" of *Technical Notes on Brick and Tile Construction* by the Brick Institute of America.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- B. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- C. Wetting: Wet units before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.
- D. Comply with construction tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:
 1. For conspicuous vertical lines, such as external corners, do not vary from plumb by more than 1/8 inch in 20 feet.
 2. For conspicuous horizontal lines, such as caps, do not vary from level by

more than 1/8 inch in 20 feet.

3. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.

3.3 REPAIRING, POINTING, AND CLEANING

- A. Rake out deteriorated mortar joints of masonry by hand using a 1/4" or less in width. Clean mortar from surfaces within the joint so that the new pointing mortar bonds to the building material, not old mortar. Do not chip or spall edges of the brick. If work is found unacceptable, raking shall cease, without additional cost to the Owner, until deficiencies in tools, workmanship, or methodologies have been corrected to the Architect's satisfaction.
- B. Where brick deterioration does not exceed 1/2" in depth, use a tinted, high-lime patching material to fill voids to create a flush surface. Patching material must match the color texture, hardness, and surface finish of the original brickwork.
- C. Where brick deterioration exceeds 1/2" in depth over more than 2 square inches of any one brick, replace deteriorated brick with new or salvaged brick to match existing.
- D. Joint depth shall be at least 2 1/2 times joint width, but no less than 1/2", and in all cases rake back to expose sound mortar. If voids are found in bedding mortar during raking operations beyond the 1 inch depth, fill all voids to 1 inch depth in same manner as pointing mortar installation.
- E. Brush, vacuum, or flush joints or cracks to remove dirt and loose debris. Joints shall be left in a damp condition, but without standing water, for repointing.
- F. Apply mortar in 1/4" thick layers, allowing each layer to reach thumbprint hardness before applying succeeding layer. Final layer shall be slightly below face of masonry. Do not allow mortar to spread over edges or to featheredge.
- G. Discard batch of mortar when easy workability is lost. Do not retemper.
- H. When the final layer of mortar is thumbprint hard, tool joint to match existing. Do not overlap face of masonry with new mortar. Remove excess mortar from joint edge by brushing. Pointing mortar shall be slightly below brick surface, not over brick surface. Do not, under any circumstances, use a chemical cleaning product to remove excess mortar without submitting information and a request for approval to the Architect.
- I. Keep joints damp for 72 hours after repointing.
- J. When masonry cleaning is to take place after repointing, allow new pointing

mortar to cure for at least 30 days before beginning cleaning operation.

- K. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- L. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
 - 1. Rinse joints, install pointing mortar in 1/4" deep layers and cure mortar for not less than 72 hours. Lay brickwork to match existing joint thicknesses. Pointing and tooling is to match existing. Do not overlap brickface with new mortar. Remove all splatters before hardened with stiff natural bristle brush after dry.
- M. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- N. Existing brickwork:
 - 1. Repair spalled and damaged brick as required using a high-lime patching material tinted to match brick or, where necessary, new or salvaged brick to match original.
 - 2. Provide all necessary ties and reinforcing, horizontal reinforcing, brick to concrete masonry ties and reinforcing bars.
 - 3. Provide weeps for drainage as required (plastic tubes, rope wicks or open head joints).
- O. Final Cleaning: Allow the mortar to cure for at least 30 days prior to cleaning. Follow manufacturer's instructions for cleaning system. After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove old mortar by hand chisel and mallet, unless Contractor can demonstrate how each operator's skilled use of power tools will not damage masonry. Even if use of power tools has been approved, the power tools shall only be used to remove the center portion of the mortar; the edges shall be removed by hand chisel to prevent the saw from overshooting and cutting into the bricks above and below. Saws may not be used directly adjacent to the brick as any slip would cut into the brick. Rake out old mortar to depth equal to 2 1/2 times joint width and in no case less than 1/2 inches or depth required to expose sound mortar. Do not damage masonry units.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of

- sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

END OF SECTION 040120

SECTION 040140.61 - STONE REPAIR

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes repairing Limestone masonry.

1.2 RELATED DOCUMENTS

- A. Division 04 Section "Masonry Repairs" for mortar sampling.

1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

1.4 DEFINITIONS

- A. Rebuilding (Setting) Mortar: Mortar used to set and anchor masonry in a structure, distinct from pointing mortar installed after masonry is set in place.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and locations of replacement stone units on the structure and their jointing.
 - 2. Show partial replacement stone units (dutchmen).
 - 3. Show provisions for expansion joints or other sealant joints.
 - 4. Show replacement and repair anchors, including drilled-in pins.
- C. Samples: For each exposed product and for each color and texture required.

1.7 INFORMATIONAL SUBMITTALS

- A. Quality-control program.

1.8 QUALITY ASSURANCE

- A. Stone Repair Specialist Qualifications: Engage an experienced stone repair firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing standard unit masonry or new stone masonry is insufficient experience for stone repair work.
- B. Quality-Control Program: Prepare a written quality-control program for this Project to systematically demonstrate the ability of personnel to properly follow methods and use materials and tools without damaging stonework. Include provisions for supervising performance and preventing damage.
- C. Mockups: Prepare mockups of stone repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
 - 1. Stone Repair: Prepare sample areas for each type of stone indicated to have repair work performed. If not otherwise indicated, size each mockup not smaller than two adjacent whole units or approximately 48 inches (1200 mm) in least dimension. Construct sample areas in locations in existing walls where directed by Architect unless otherwise indicated. Demonstrate quality of materials, workmanship, and blending with existing work.

PART 2 - PRODUCTS

2.1 STONE MATERIALS

- A. Stone Matching Existing: Natural building stone of variety, color, texture, grain, veining, finish, size, and shape that match existing stone.

2.2 LIMESTONE

- A. Material Standard: Comply with ASTM C568/C568M.
 - 1. Classification: II Medium-Density.
- B. Description: Match existing limestone.
- C. Varieties and Sources: Provide products that comply with the physical requirements to match the existing materials in strength, color and texture. Retain last option in "Finish" Paragraph below for Indiana limestone.
- D. Finish: Match existing.
 - 1. For existing stone that exhibits a range of colors, texture, grain, veining, finishes, sizes, or shapes, provide stone that proportionally matches that range rather than stone that matches an individual color, texture, grain, veining, finish, size, or shape within that range.

2. Quarry: Subject to compliance with requirements, provide stone from a quarry that matches the existing materials.
- E. Cutting New Stone: Cut each new stone so that, when it is set in final position, the rift or natural bedding planes will match the rift orientation of existing stones.
- F. Carving and Decorative Aspects: Employ skilled carvers and match existing from models cast in the field.

2.3 MORTAR MATERIALS

- A. Mortar shall be based on samples and analysis performed under Division 04 Section "Masonry Repairs".
- B. Utilize a Mix Design that is consistent with the mortar composition analysis.
- C. No additives are permitted except stable, non-fading tinting agents if approved by the Architect to obtain exact mortar mix color.
- D. Portland Cement: Type and quantity to match the composition analysis. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C114.
- E. Aggregate for Mortar: ASTM C144, to match existing composition.
 1. Use washed aggregate consisting of natural sand or crushed stone; to match existing composition.
 2. For joints less than ¼-inch thick, use aggregate graded with 100 percent passing the No. 16 sieve, to match existing composition.
- F. Hydrated Lime: ASTM C207, Type S, to match existing composition.
- G. Mortar Pigments: ASTM C979/C979M, compounded for use in mortar mixes, and having a record of satisfactory performance in stone mortars.
 1. Use formulation that is vapor and water permeable (equal to or more than the stone), exhibits low shrinkage, has lower modulus of elasticity than stone units being repaired, and develops high bond strength to all types of stone.
 2. Formulate patching compound in colors, textures, and grain to match stone being patched.
- H. Cementitious Crack Filler: Ultrafine superplasticized grout that can be injected into cracks, is suitable for application to wet or dry cracks, exhibits low shrinkage, and develops high bond strength to all types of stone.
- I. Stone-to-Stone Adhesive: Two-part polyester or epoxy-resin stone adhesive with a 15- to 45-minute cure at 70 deg F (21 deg C), recommended in writing by adhesive manufacturer for type of stone repair indicated, and matching stone color.

2.4 ACCESSORY MATERIALS

- A. Setting Buttons and Shims: Resilient plastic, nonstaining to stone, sized to suit joint thicknesses and bed depths of stone units, less the required depth of pointing materials unless removed before pointing.
- B. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:
 - 1. Previous effectiveness in performing the work involved.
 - 2. Minimal possibility of damaging exposed surfaces.
 - 3. Consistency of each application.
 - 4. Uniformity of the resulting overall appearance.
 - 5. Do not use products or tools that could leave residue on surfaces.

2.5 MORTAR MIXES

- A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer. Mortar mix shall match existing composition.
- B. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
 - 1. Mortar Pigments: Where mortar pigments are indicated, do not add pigment exceeding 10 percent by weight of the cementitious or binder materials, except for carbon black which is limited to 2 percent.
- C. Do not use admixtures in mortar unless otherwise indicated.
- D. Mixes: Mix mortar materials in proportions that are consistent with the existing composition.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect windows, doors and other building components.

3.2 STONE REMOVAL AND REPLACEMENT

- A. At locations indicated, remove stone that has deteriorated or is damaged beyond repair or is to be reused. Carefully remove entire units from joint to joint, without damaging surrounding stone, in a manner that permits replacement with full-size units.
- B. Support and protect remaining stonework that surrounds removal area.
- C. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.

- D. Notify Architect of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing stone or unit masonry backup, rotted wood, rusted metal, and other deteriorated items.
- E. Remove in an undamaged condition as many whole stone units as possible.
 - 1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes, and water.
 - 2. Remove sealants by cutting close to stone with utility knife and cleaning with solvents.
- F. Clean stone surrounding removal areas by removing mortar, dust, and loose particles in preparation for stone replacement.
- G. Replace removed damaged stone with other removed stone in good condition, where possible, matching existing stone, including direction of rift or natural bedding planes. Do not use broken units unless they can be cut to usable size.
- H. Install replacement stone into bonding and coursing pattern of existing stone. If cutting is required, use a motor-driven saw designed to cut stone with clean, sharp, unchipped edges. Finish edges to blend with appearance of edges of existing stone.
 - 1. Maintain joint width for replacement stone to match existing joints.
 - 2. Use setting buttons or shims to set stone accurately spaced with uniform joints.
- I. Set replacement stone with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter vertical joints for full width before setting, and set units in full bed of mortar unless otherwise indicated. Replace existing anchors with new anchors matching existing configuration.
 - 1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing stonework.
 - 2. Rake out mortar used for laying stone before mortar sets according to Division 04 Section "Masonry Repairs". Point at same time as repointing of surrounding area.
 - 3. When mortar is hard enough to support units, remove shims and other devices interfering with pointing of joints.
- J. Curing: Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours, including weekends and holidays.
 - 1. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.

3.3 PARTIAL STONE REPLACEMENT

- A. Remove defective portion of existing stone unit (backing stone). Carefully remove defective portion of stone by making vertical and horizontal saw cuts at face of backing stone and removing defective material to depth required for fitting partial replacement (dutchman).
 - 1. Make edges of backing stone at cuts smooth and square to each other and to finished surface; essentially rectangular. Make back of removal area flat and parallel to stone face.

2. Do not overcut at corners and intersections. Hand trim to produce clean sharp corners with no rounding and no damage to existing work to remain.
 3. If backing stone becomes damaged further, remove damaged area and enlarge partial replacement as required.
- B. Remove mortar from joints that abut area of stone removal to same depth as stone was removed. Remove loose mortar particles and other debris from surfaces to be bonded and surfaces of adjacent stone units that will receive mortar by cleaning with stiff-fiber brush.
 - C. Cut and trim partial replacement to accurately fit area where material was removed from backing stone. Fabricate to size required to produce joints between partial replacement and backing stone of no more than **1/16 inch (1.6 mm)** in width, and joints between partial replacement and other stones that match existing joints between stones.
 - D. Concealed Pinning: Before applying adhesive, prepare for concealed mechanical anchorage consisting of **1/4-inch- (6-mm-)** diameter, threaded stainless-steel pins set into **1/4-inch- (6-mm-)** diameter holes drilled into backing stone and into, but not through, the partial replacement.
 - E. Apply stone-to-stone adhesive according to adhesive manufacturer's written instructions. Coat bonding surfaces of backing stone and partial replacement, completely filling all crevices and voids.
 - F. Apply partial replacement while adhesive is still tacky and hold securely in place until adhesive has cured. Use temporary shims, clamps, wedges, or other devices as necessary to align face of partial replacement with face of backing stone.
 - G. Clean adhesive residue from exposed surfaces and patch chipped areas and exposed drill holes.

3.4 STONE PLUG REPAIR

- A. Remove cylindrical piece of damaged stone by core-drilling perpendicular to stone surface.
- B. Prepare a replacement plug by core-drilling replacement stone. Use a drill sized to produce a core that will fit into hole drilled in damaged stone with only minimum gap necessary for adhesive.
- C. Apply stone-to-stone adhesive according to adhesive manufacturer's written instructions. Coat bonding surfaces of existing stone and plug, completely filling all crevices and voids.
- D. Apply plug while adhesive is still tacky and hold securely in place until adhesive has cured.
- E. Clean adhesive residue from exposed surfaces.

3.5 STONE-FRAGMENT REPAIR

- A. Carefully remove cracked or fallen stone fragment indicated to be repaired. Reuse only stone fragment that is in sound condition.

3.7 STONE PATCHING

- A. Remove deteriorated material and remove adjacent material that has begun to deteriorate. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least **1/4 inch (6 mm)** thick, but not less than recommended in writing by patching compound manufacturer.
- B. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of stone unit.
- C. Mix patching compound in individual batches to match each stone unit being patched. Combine one or more colors of patching compound, as needed, to produce exact match.
- D. Brush-coat stone surfaces with slurry coat of patching compound according to manufacturer's written instructions.
- E. Place patching compound in layers as recommended in writing by patching compound manufacturer, but not less than **1/4 inch (6 mm)** or more than **2 inches (50 mm)** thick. Roughen surface of each layer to provide a key for next layer.
 - 1. Simple Details: Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the stone. Shape and finish surface before or after curing, as determined by testing, to best match existing stone.
 - 2. Carved Details: Build patch up **1/4 inch (6 mm)** above surrounding stone, and carve surface to match adjoining stone after patching compound has hardened.
- F. Keep each layer damp for 72 hours or until patching compound has set.
- G. Remove and replace patches with hairline cracks or that show separation from stone at edges, and those that do not match adjoining stone in color or texture.

3.8 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, applied by low-pressure spray.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners.

END OF SECTION 040140.61

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General and Conditions, and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 1. Fire-retardant treated wood blocking.
 2. Gypsum Wall Sheathing and Weather Resistant Barrier.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a DPMC prequalified independent testing agency.
 2. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a DPMC prequalified independent testing agency according to ASTM D 5664.
 3. Submit product data for gypsum wall sheathing and weather resistant barrier that show compliance with requirements.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
 1. Fire-retardant-treated wood.
 2. Power-driven fasteners.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, a DPMC prequalified inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Dress lumber, S4S, unless otherwise indicated.
 - 3. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.
- C. Kiln-dry lumber after treatment to maximum moisture content of 15 percent. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
 2. Rooftop equipment bases and support curbs.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:
1. Mixed southern pine or southern pine; SPIB.
 2. Hem-fir; WCLIB or WWPA.

2.4 WOOD FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC as appropriate for the substrate.
1. Material: Screws; hot-dipped galvanized steel.

2.5 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.
1. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

2.6 GYPSUM WALL SHEATHING

- A. Glass Mat Gypsum Wall Sheathing: ASTM C 1177 gypsum sheathing. Basis of Design is "SECUROCK Brand Glass Mat Sheathing" as manufactured by US Gypsum Company or approved equal. Comparable products that meet or exceed the specifications will be considered, including the following:
1. CertainTeed
 2. Georgia-Pacific
 3. Gold Bond
 4. Or approved equal
- B. Fasteners:
1. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and application.

1. Screws for Fastening Sheathing to Metal Framing: #6 x 1-5/8 inch with corrosion-resistance of more than 800 hours per ASTM B117 (minimum).

2.7 WEATHER RESISTANT BARRIER

- A. Building Wrap: ASTM E 1677, Type I air retarder, with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84, UV stabilized and acceptable to authorities having jurisdiction. Barrier shall be 30-mil thick, high temperature, self-adhering product.
- B. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building wrap manufacturer for sealing joints and penetrations in building wrap.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- C. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 1. Table 2304.10.1, "Fastening Schedule," in 2018 International Building Code, NJ Edition..

3.2 GYPSUM WALL SHEATHING INSTALLATION

- A. Comply with ASTM C 1280, GA-253 and manufacturer's written instructions.
 1. Fasten sheathing to cold-formed metal framing with screws spaced 16-inches on center horizontally, 12-inches on center vertically and 8-inches maximum from edges.
 2. Install boards with a 3/8-inch gap where load-bearing construction abuts structural elements.
 3. To prevent wicking, install boards with 1 1/4-inch gap where they abut masonry or similar materials that might retain moisture.
 4. Apply fasteners so heads bear tightly against face of sheathing boards but do not cut into facing.
- B. Sheathing may be installed with the long dimension of the sheathing either parallel or perpendicular to framing. Abut ends and/or edges of the boards centered over face of framing members. Offset board joints by not less than one stud spacing

- C. Install Building Wrap: Comply with manufacturer's written instructions.
 - 1. Seal seams, edges, fasteners, and penetrations with tape.
 - 2. Extend into jambs of openings and seal corners with tape.

3.3 PROTECTION

- A. Protect materials from weather. If, despite protection, materials become wet, apply EPA-registered borate treatment by spraying to comply with EPA-registered label.
- B. Replace sheathing and weather resistant barrier damaged by weather.

END OF SECTION 061000

SECTION 07 42 13 –METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes
 - 1. Factory-formed: concealed-fastener, metal wall panels.
 - 2. Finish must conform to the "Metal Construction Association Certified Premium Painted™" designation
- A. Division 5 Section "Cold Formed Metal Framing"
- B. Division 6 Section "Rough Carpentry"
- C. Division 7 Section "Sheet Metal Flashing and Trim"

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide metal wall panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B. System shall meet performance criteria as installed. Either test data or signed and sealed engineering calculations shall document the performance of the panel system to meet design loads required.
- E. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of wall area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24lbf/sq. ft.
- F. Water Penetration: No water penetration when tested according to ASTM E 331 at a minimum differential pressure of 20 percent of inward-acting, wind-load design pressure of not less than 6.24 lbf/sq. ft. and not more than 12 lbf/sq. ft.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's current product specifications and installation instructions.
- B. Shop Drawings: Include small-scale elevations, as required. Show details of trim and

flashing conditions, fastening and anchorage methods, weatherproofing techniques, terminations, and penetrations.

C. Samples:

1. Selection Samples: Submit actual metal chips with full range of colors available for Architect's selection.
2. Verification Samples: Submit two samples of each type of metal panel required, not less than 12 inches (305mm), and illustrating finished panel profile.

D. Product Test Reports: Submit copies of test reports or load tables verifying performance capability of panel system:

1. Metal Wall Panels: Include reports for UL 790/ASTM E 108, UL 580, ASTM E 283, ASTM E 331, Field Tested, ASTM E 84 Flame Spread Rating, Paint Performance Tests, AAMA 2605.
2. Fastener test and pull-out calculations
3. Load tables
4. Maintenance Data

1.6 QUALITY ASSURANCE

- A. Installer: Company specializing in the type of work required for this project.
- B. Pre-Installation meeting: Convene meeting not less than one week prior to beginning installation between general contractor, installing contractor, owner's representative and manufacturer.

1.7 DELIVERY, STORAGE & HANDLING

- A. Do not deliver materials of this section to project site until suitable facilities for storage and protection are available.
- B. Protect materials from damage during transit and at project site. Store under cover, but sloped to provide positive drainage. Do not expose materials with strippable protective film to direct sunlight or extreme heat.
- C. Do not allow storage of other materials or allow staging of other work on installed metal panel system.
- D. Upon receipt of delivery of metal panel system, and prior to signing the delivery ticket, the installer is to examine each shipment for damage and for completion of the consignment.

1.8 WARRANTY

- A. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal roofing that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish Warranty Period: 30 years from date of Substantial Completion.
- B. Special Installer's Warranty: Specified form in which Wall Installer agrees to repair or replace components of custom-fabricated sheet metal wall that fail in materials or workmanship within 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer's Qualifications: All panels are to be factory formed and packaged per job requirements.
 - 1. Manufacturer must be certified to ISO 9001:2008 with design.
- B. Specification Basis of Design manufacturer is ATAS International, Inc; see below for product and other manufacturers.
- C. Coordinate with insulation requirements as noted by Architect.
- D. Secondary framing members as required for load criteria and wind requirements.

2.2 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

- A. Concealed-fastener, Lap seam Metal Wall Panels: Provide factory-formed metal wall panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation
- B. Wide-Reveal-Joint, Concealed-Fastener Metal Wall Panels. Formed with vertical panel edges and stepped profile between panel edges resulting in wide reveal joint between panels.
 - 1. Basis-of Design Product: ATAS International, Inc.; Multi-Purpose Panels™ - MPN
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ATAS International, Inc.
 - b. MBCI Inc
 - c. Centria
 - d. Or approved equal.
 - 3. Material: Aluminum - .032 thick
 - a. Texture: Smooth

- b. Finish: KYNAR 5000® PDVF or HYLAR 5000® Finish
- c. Color: Patina Green (12)

- 4. Panel Coverage: 16"
- 5. Panel Height: 1-1/4"
- 6. Panel Application Orientation: Vertical.

2.3 FABRICATION

A. Panels:

- 1. Panels to be Factory fabricated in a controlled environment.
- 2. Panels to be tension leveled during roll forming process.
- 3. Panels to be produced in longest lengths possible, except when modular units are utilized.

B. Form all components true to shape, accurate in size, square and free from distortion or defects. Cut panels to precise lengths indicated on approved shop drawings or as required by field conditions.

C. Accessories: Factory fabricates trim and flashing components in standard 12-foot lengths.

- 1. Form panel lines, breaks, and angles to be sharp and true, with surfaces free from warp and buckle.
- 2. Fabricate wall panels as required to maintain fabrication tolerances and to withstand design loads.

D. Fabricate metal wall panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.

E. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

F. Panels, fabrication and installation shall meet the requirements of the Metal Construction Association Preformed Metal Wall Guidelines

PART 3 - EXECUTION

3.1 PREPARATION

A. Field Measurements

- 1. Field measurements should be taken by the installer for verification of dimensional correctness in relationship to original plans, prior to providing manufacturer with a bill of material.

B. Delivery, Storage and Handling

1. Do not deliver materials of this section to project site until suitable facilities for storage and protection are available.
2. Protect materials from damage during transit and at project site. Store under cover, but sloped to provide positive drainage. Do not expose materials with strippable protective film to direct sunlight or extreme heat.
3. Do not allow storage of other materials or allow staging of other work on installed metal panel system.
4. Upon receipt of delivery of metal panel system, and prior to signing the delivery ticket, the installer is to examine each shipment or damage and for completion of the consignment.

C. Sequencing and Scheduling

1. Installer shall coordinate with general contractor as to scheduled delivery time after receipt of field verified bill of material by manufacturer as it relates to actual project scheduling.

3.2 METAL WALL PANEL INSTALLATION, GENERAL

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and subgirts, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cutting of metal wall panels by torch is not permitted.
2. Rigidly fasten metal wall panels and allow for thermal expansion and contraction as required by the panel manufacturer. Pre-drill panels as required.
3. Install screw fasteners.
4. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
5. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated or, if not indicated, as necessary for waterproofing and material compatibility.
6. Provide weatherproof seals for pipe and conduit penetrating exterior walls.

B. Fasteners: Use fasteners of size and length as required for compatibility with substrate.

1. Aluminum Wall Panels: Use stainless-steel fasteners or metallic coated fasteners for surfaces exposed to the exterior and aluminum or galvanized steel fasteners for surfaces exposed to the interior.

2. Concealed fasteners shall have a high performance coating
 3. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal wall panel manufacturer.
 4. Coat back side of aluminum wall panels with bituminous coating where wall panels will contact wood, ferrous metal, or cementitious construction.
- C. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal wall panel assemblies.

3.3 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete sheet metal roofing assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 2. Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual" and NRCA Waterproofing Manual. Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 3. Panels, fabrication and installation shall meet the requirements of the Metal Construction Association Preformed Metal Wall Guidelines.
- B. Coordinate with installation of:
1. Cold Formed Metal Framing, as noted in Section 5
 2. Rough Carpentry, as noted in Section 6
 3. Sheet Metal Flashing and Trim, as noted in Section 7
 4. Metal Copings, as noted in Section 07 71 13

3.4 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed. Maintain in a clean condition during construction.
- B. Protection:
1. Provide as required completed work of this section will be without damage or

deterioration at date of substantial completion.

- C. Touch up minor abrasions with matching paint provided by panel manufacturer. Remove and replace panels that cannot be satisfactorily touched up. See Metal Construction Association Technical Bulletin #95-1051.
- D. Sweep and remove chips, shavings and dust from roof on a daily basis during installation period. Leave installed work clean, free from grease, finger marks and stains. Remove all protective masking from material immediately after installation of product.
- E. Upon completion of installation, remove scraps and debris from project site.
- F. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt and sealant.

END OF SECTION 07 42 13

SECTION 075200 – SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

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.
- B. Attached Drain Visions Report dated 02.14.2020 indicating approximate storm water piping locations and findings (6 pages).

1.2 SUMMARY

- A. Section Includes:
 - 1. Styrene-butadiene-styrene (SBS)-modified bituminous membrane roofing.
 - 2. Roof insulation.
 - 3. Cover board.
 - 4. Walkways.
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry and Sheathing for wood nailers, curbs, and blocking, and for wood-based, structural-use roof deck panels.
 - 2. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings, counterflashings, copings, scuppers and downspouts, and miscellaneous metal components.
 - 3. Section 079200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

1.4 PRECONSTRUCTION MEETING

- 1. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.
 - 1. Meet with Owner, Construction Manager, Architect, inspecting agency representative, roofing Installer, roofing system manufacturer's representative, HVAC installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.
- B. Shop Drawings: Include plans, sections, details, and attachments to other work, including the following:
 1. Layout and thickness of insulation.
 2. Base flashings and membrane terminations.
 3. Flashing details at penetrations.
 4. Tapered insulation, including slopes.
 5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
 6. Crickets, saddles, and tapered edge strips, including slopes.
 7. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
 8. Tie-in between existing and new roof systems.
- C. Samples for Verification: For the following products:
 1. Cap Sheet: Samples of manufacturer's standard colors for selection by Architect.
 2. Flashing Sheet: Samples of manufacturer's standard colors for selection by Architect.
 3. Aggregate surfacing material in gradation and color required.
 4. Walkway Pads or Rolls: Samples of manufacturer's standard colors for selection by Architect.
- D. Wind Uplift Resistance Submittal: For roofing system indicating compliance with wind uplift performance requirements.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Manufacturer Certificates:
 - 1. Performance Requirement Certificate: Signed by roof membrane manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a) Submit evidence of complying with performance requirements.
 - 2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.
- C. Product Test Reports: For roof membrane and insulation, tests performed by a qualified testing agency, indicating compliance with specified requirements.
- D. Evaluation Reports: For components of membrane roofing system, from ICC-ES
- E. Field Test Reports
 - 1. Fastener-pullout test results and manufacturer's revised requirements for fastener Patterns.
- F. Field quality-control reports.
- G. Sample Warranties: For manufacturer's special warranties.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is listed in FM Approvals' RoofNav] for roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
 - 1. Protect stored liquid material from direct sunlight.
 - 2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources.
 - 1. Store in a dry location.
 - 2. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.10 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.11 WARRANTY

- A. Special Warranty: Manufacturer special No Dollar Limit (NDL) Warranty, and agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes membrane roofing, base flashings, roof insulation, and other components of roofing system.
 - 2. Warranty Period: Twenty (20) years from date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
 - 1. Warranty Period: Five (5) years from date of Substantial Completion. When warranties are required, verify with Owner's counsel that warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure

due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.

- a. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 - b. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746/D3746M, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897
1. Roof System Design Pressures: Calculated in accordance with ASCE 7, or applicable standard, for the specified roof system attachment requirements.
 2. Approval Rating: FM I-90.
- D. Roof Slope: ¼-inch per foot (2%) minimum for roof drainage.
- E. Impact Resistance:
1. Performance testing for impact resistance shall be in accordance with FM4450, FM4470, ASTM D3746 or CGSB 37-GP 56M to meet the specified impact resistance requirements.
 - a. Meets requirements for FM-SH (Severe Hail), ASTM D3746, or CGSB 37-GP 56M.
 - b. Energy Performance: Roofing system shall have an initial solar reflectance index (SRI) of not less than 81 and an initial thermal emittance of 0.91 when tested according to CRRC-1
- F. Exterior Fire-Test Exposure: UL790, ASTM E108, FM4450, or FM4470.
- G. Cyclic Fatigue: The roof system shall pass ASTM D5849 Standard Test Method for Evaluating Resistance of Modified Bituminous Roofing Membrane to Cyclic Fatigue (Joint Displacement). Passing results shall show no signs of cracking, splitting or tearing over the joint.

2.2 MANUFACTURER AND ROOF SYSTEMS

- A. Basis of Design Manufacturer and Roof System: Soprema “Soprafix”, located at 310 Quadral Drive, Wadsworth, OH 44281; telephone 800-356-3521; 330-334-0066. Other manufacturers and roof systems that meet or exceed the properties of the Basis of Design will be considered after review and approval by the Architect, including:
1. Firestone.
 2. Manville.
 3. Siplast.
 4. Or approved equal.

2.3 BASE SHEET MATERIALS – ADHERED

- A. Basis of Design: “Soprafix Base 622, as manufactured by Soprema. Other products that meet or exceed the properties of the Basis of Design will be considered after review and approval by the Architect, including:
1. Firestone.
 2. Manville.
 3. Siplast.
 4. Or approved equal.
- B. Product Data: SBS-modified bitumen membrane ply with plastic burn-off film in side-laps only, and sanded top and bottom surface. Non-woven polyester reinforcement. Mechanically fastened in 4 in (minimum) heat-welded side-laps. Base ply for cold adhesive-applied and self-adhered cap sheet applications. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods:
1. Thickness: 110 mils (2.5 mm)
 2. Width: 39.4 in (1 m)
 3. Length: 32.8 ft (10 m)
 4. Roll weight: 74 lb (33.6 kg)
 5. Net mass per unit area, lb/100 sq ft (g/m²):
 - a) 68 lb (2855 g)
 6. Peak load @ 0°F (-18°C), lbf/in (kN/m).
 - a) MD 115 lbf/in (20.1 kN/m), XMD 85 lbf/in (14.9 kN/m)
 7. Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m):
 - a) MD 35%, XMD 40%
 8. Peak load @ 73.4°F (23°C), lbf/in (kN/m):
 - a) MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
 9. Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m):
 - a) MD 55%, XMD 65%
 10. Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m):
 - a) MD 65%, XMD 80%
 11. Tear Strength @ 73.4°F (23°C), lbf (N):
 - a) MD 125 lbf (556 N), XMD 85 lbf (378 N)
 12. Low temperature flexibility, °F (°C):
 - a) MD/XMD: -15°F (-26°C)
 13. Dimensional stability, %:
 - a) MD/XMD: Less than 0.5%
 14. Compound stability, °F (°C): MD/XMD: 240°F (116°C):

2.4 FLASHING BASE PLY, FLASHING CEMENT APPLIED

- A. Basis of Design: “Sopralene 180 Sanded”, as manufactured by Soprema. Other products that meet or exceed the properties of the Basis of Design will be considered after review and approval by the Architect, including:
1. Firestone.
 2. Manville.
 3. Siplast.
 4. Or approved equal.

- B. Product Data: SBS-modified bitumen membrane sanded on both top and bottom surfaces. Non-woven polyester reinforced. Meets or exceeds ASTM D6164, Type I, Grade S, per ASTM D5147 test methods:

1. Thickness: 118 mils (3.0 mm)
2. Width: 39.4 in (1 m)
3. Length: 32.8 ft (10 m)
4. Roll weight: 84 lb (38.1 kg)
5. Net mass per unit area, lb/100 sq ft (g/sq m):
 - a) 78 lb (4060 g)
6. Peak load @ 0°F (-18°C), lbf/in (kN/m).
 - a) MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
7. Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m):
 - a) MD 35%, XMD 40%
8. Peak load @ 73.4°F (23°C), lbf/in (kN/m):
 - a) MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
9. Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m):
 - a) MD 55%, XMD 60%
10. Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m):
 - a) MD 65%, XMD 80%
11. Tear Strength @ 73.4°F (23°C), lbf (N):
 - a) MD 125 lbf (556 N), XMD 85 lbf (378 N)
12. Low temperature flexibility, °F (°C):
 - a) MD/XMD: -15°F (-26°C)
13. Dimensional stability, %:
 - a) MD/XMD: Less than 0.5%
14. Compound stability, °F (°C):
 - a) MD/XMD: 240°F (116°C)

2.5 MODIFIED BITUMINOUS CAP SHEET – COLD ADHESIVE APPLIED

- A. Basis of Design: “Sopralene 180 FR GR”, as manufactured by Soprema. Other products that meet or exceed the properties of the Basis of Design will be considered after review and approval by the Architect, including:

1. Firestone.
2. Manville.
3. Siplast.
4. Or approved equal.

- B. Product Data: SBS-modified bitumen membrane Cap Sheet with a sanded bottom surface and mineral granule top surface. Non-woven polyester reinforced. UL Class A, meets or exceeds ASTM D6164, Type I, Grade G:

1. Thickness: 157 mils (4.0 mm)
2. Width: 39.4 in (1 m)
3. Length: 32.8 ft (10 m)
4. Roll weight: 117 lb (53.1 kg)
Net mass per unit area, lb/100 sq ft (g/sq m): 109 lb (5322 g)
5. Peak load @ 0°F (-18°C), lbf/in (kN/m).

- MD 115 lbf/in (20.1 kN/m), XMD 90 lbf/in (15.8 kN/m)
6. Elongation at peak load @ 0°F (-18°C), lbf/in (kN/m):
MD 35%, XMD 40%
 7. Peak load @ 73.4°F (23°C), lbf/in (kN/m):
MD 85 lbf/in (14.9 kN/m), XMD 65 lbf/in (11.4 kN/m)
 8. Elongation at peak load @ 73.4°F (23°C), lbf/in (kN/m):
MD 55%, XMD 60%
 9. Ultimate Elongation @ 73.4°F (23°C), lbf/in (kN/m):
MD 65%, XMD 80%
 10. Tear Strength @ 73.4°F (23°C), lbf (N):
MD 125 lbf (556N), XMD 85 lbf (378N)
Low temperature flexibility, °F (°C): MD/XMD: -15°F (-26°C)
Dimensional stability, %: MD/XMD: Less than 0.5%
 11. Compound stability, °F (°C): MD/XMD: 240°F (116°C):
 12. Granule Surfacing: White mineral granules.

2.6 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components
- B. Primers: As manufactured by roofing system manufacturer for the intended application and conditions.
- C. Membrane Adhesives: As manufactured by roofing system manufacturer for the intended application and conditions.
- D. Mopping Asphalt: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.
- E. Flashing Cement: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.
- F. General Purpose Roofing Cement and Mastic: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.
- G. General Purpose Sealant: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.
- H. Base Sheet/Anchor Sheet Fasteners: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.
- I. Membrane Fasteners and Plates: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.
- J. Liquid Applied Reinforced Flashing System: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.
- K. Mineral Granules: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.

- L. Expansion Joint: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions.
- M. Walkway Protection: As manufactured or as recommended by roofing system manufacturer for the intended application and conditions

2.7 SUBSTRATE BOARDS

- A. Substrate Board: ASTM C 1177C/C1177M, Type X gypsum board; Thickness: 1/2 inch.
 - 1. Fasteners: Adhered.

2.8 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by TPO roof membrane manufacturer, and approved for use in FM Approvals' RoofNav-listed roof assemblies.
- B. Polyisocyanurate Board Insulation Basis of Design: "Sopra ISOr" as manufactured by Soprema. Other manufacturers and roof systems that meet or exceed the properties of the Basis of Design will be considered after review and approval by the Architect, including:
 - 1. Firestone.
 - 2. Manville.
 - 3. Siplast.
 - 4. Or approved equal.
- C. Product Data: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces. Insulation must be approved by roofing system manufacturer.
 - 1. Insulation Thickness and R-Value:
 - a. Base and top layers; refer to drawings for locations:
 - 1) 2.5-inches; R = 14.4
 - 2) 3.5-inches; R = 20.5.
- D. Polyisocyanurate Tapered Insulation Basis of Design: "Sopra-ISOr Tapered as manufactured by Soprema. Subject to compliance with requirements, provide comparable product by one of the following:
 - 1) Carlisle.
 - 2) GAF.
 - 3) Manville.
 - 4) Or approved equal.
- E. Tapered Insulation: Provide factory-tapered insulation boards.
 - 1. Material: Match roof insulation.
 - 2. Minimum Thickness: 1/4 inch (6.35 mm).
 - 3. Slope:

- a) Roof Field: 1/4 inch per foot (1:48) unless otherwise indicated on Drawings.
- b) Saddles and Crickets: 1/2 inch per foot (1:24) unless otherwise indicated on Drawings.

2.9 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components. Retain "Fasteners" Paragraph below if insulation requires mechanical fastening. Retain option if separate cover boards require fastening.
- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 1. Modified asphaltic, asbestos-free, cold-applied adhesive.
 2. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
 3. Full-spread, spray-applied, low-rise, two-component urethane adhesive.
- C. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum board or ASTM C 1278/C 1278M fiber-reinforced gypsum board.
 1. Thickness: 1/2-inch (16 mm), R = 0.56.
 2. Surface Finish: Factory primed.

2.10 VAPOR RETARDER

- A. Laminated Sheet: Polyethylene laminate, two layers, reinforced with cord grid, with maximum permeance rating of 0.06 perm (3.5 ng/Pa x s x sq. m).
 1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions remain satisfactory throughout the project.
- B. The contractor shall examine all roofing substrates including, but not limited to: insulation materials, roof decks, walls, curbs, rooftop equipment, fixtures, and wood blocking.
- C. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing materials.

- D. During the application of specified materials, the applicator shall continue to examine all project conditions to ensure conditions remain satisfactory to complete the specified roofing system.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PROTECTION AND REMOVALS

- A. Protect existing building and site components from damage during and throughout the duration of work. Contractor is responsible to repair any damage to exterior or interior surfaces.
- B. Utilize covered chutes to convey debris from the roof to dumpsters. Protect ground and paving to receive dumpsters. Protect canopies, skylight and greenhouse.
- C. Do not remove any more roofing that can be replaced in a single work day. Leave the building in a water-tight condition at the end of each work day.
- D. Remove all roofing materials down to the existing concrete roof deck. Clean all roofing materials from deck to allow proper fastening. New roof system manufacturer must accept the condition of the existing deck prior to initiating roof installation.
- E. Provide night tie-ins between existing and new roofing to assure water-tight conditions.

3.3 PREPARATION

- A. Before commencing work each day, the contractor shall prepare all roofing substrates to ensure conditions are satisfactory to proceed with the installation of specified roofing materials. Preparation of substrates includes, but is not limited to, substrate repairs, securing of substrates, eliminating all incompatible materials, and cleaning.
- B. Where conditions are found to be unsatisfactory, work shall not begin until conditions are made satisfactory to begin work. Commencing of work shall indicate contractor's acceptance of conditions.

3.4 PRIMER APPLICATION

- A. Examine all substrates, and conduct adhesion peel tests as necessary, to ensure satisfactory adhesion is achieved.
- B. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified roofing materials.
- C. Apply primer using brush, roller, or sprayer at the rate published on the product data sheet. Lightly prime for uniform coverage, do not apply heavy or thick coats of primer.

- D. Asphalt Primer: Apply primer to dry compatible masonry, metal, wood and other required substrates before applying asphalt and heat-welded membrane plies. Primer is optional for solvent based solvent-based SBS adhesives and cements. Refer to product data sheets.
- E. Project conditions vary throughout the day. Monitor changing conditions, monitor the drying time of primers, and monitor the adhesion of the membrane plies. Adjust primer and membrane application methods as necessary to achieve the desired results.

3.5 BASE SHEET/VAPOR BARRIER INSTALLATION

- A. Follow material product data sheets and published general requirements for installation instructions.
- B. Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application.
- C. Unroll the sheet onto the roof surface and allow time to relax prior to installation
- D. Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- E. Cut sheet to working lengths and widths as required, conforming to rooftop conditions.
- F. Align sheet at side-laps to produce a consistent overlap required for wind uplift resistance approvals.
- G. Install in accordance with manufacturer's recommendations.

3.6 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and roof insulation manufacturer's written instructions for installing roof insulation.
- C. Adhered Insulation: Install first layer of insulation to deck with adhesives recommended by manufacturer and approved by FM-Global
 - 1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.
 - 2. Set each subsequent layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

3.7 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction.
 - 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 2. At internal roof drains, conform to slope of drain sump.
 - 3. Trim cover board so that water flow is unrestricted.
 - 4. Cut and fit cover board tight to nailers, projections, and penetrations.
 - 5. Loosely lay cover board over substrate.
 - 6. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:
 - 7. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 - 8. Install slip sheet over cover board and beneath roof membrane.

3.8 FLASHING

- A. The ambient temperature shall be above 50°F (10°C), and the flashing cement temperature shall be a minimum of 70°F (21°C) at the point of membrane application.
- B. To ensure the flashing cement is applied at 70°F (21°C), during cold weather, pails shall be stored in heated areas. Pails exposed to cold temperature on the roof shall be provided with heaters when necessary to ensure the minimum application temperature is Maintained
- C. Priming substrates is optional when solvent-based membrane adhesives are used. Primer may be applied to reduce adhesive consumption rates for some absorptive substrates.
- D. Manufacturer's flashing cement may be applied using ¼ inch notched trowel. Apply 2.0 – 2.5 gallons per square to each surface. Primer may be used to reduce consumption of solvent based flashing cement.
- E. Application rates vary based on substrate porosity and roughness.

3.9 SBS MASTIC AND GENERALPURPOSE ROOFING CEMENT APPLICATION

- A. Apply manufacturer's general purpose SBS mastic and roofing cement to seal drain leads, metal flanges, seal along membrane edge at terminations, and where specified and required in detail drawings.

- B. Do not use general purpose SBS mastics and roofing cement where flashing cement applications are required. Do not use SBS mastics and roofing cement beneath SBS-modified bitumen membrane and flashing plies.
- C. Apply general purpose SBS mastic and elastic roofing cement using caulk gun, or notched trowel at 2.0 – 2.5 gallons per square on each surface. Application rates vary based on substrate porosity and roughness. Tool-in as necessary to seal laps 10. Embed matching granules into wet cement where exposed.

3.10 COLD ADHESIVE-APPLIED MEMBRANE APPLICATION

- A. Follow material product data sheets and published general requirements for installation instructions.
- B. Ensure environmental conditions are satisfactory, and will remain satisfactory, during the application of the membrane adhesive and membrane plies.
- C. Unroll membrane onto the roof surface and allow the membrane to relax prior to installing the membrane.
- D. Re-roll the membrane in order for the plies to be rolled into the adhesive while ensuring the specified side and end-laps are maintained
- E. Starting at the low point of the roof, lay out the membrane to ensure the plies are installed perpendicular to the roof slope, shingled to prevent back-water laps.
- F. Cut rolls to working lengths and widths to conform to roof conditions, and lay out to always work to a selvage edge.
- G. Ensure all roofing and flashing substrates are prepared as necessary, and all substrates are acceptable to receive the specified adhesive and membrane.
- H. Install the specified membrane adhesive ahead of the membrane application. Do not allow the adhesive to skin-over before the membrane is applied into the adhesive. The membrane will not adhere where adhesive has skinned over.
- I. Where laps are adhered using membrane adhesive, apply sufficient adhesive coverage to ensure 1/8 to 1/4 in bleed-out is present at all laps.
- J. Once set in place, ensure specified side-laps and end-laps are maintained.
- K. At end-laps, cut a 45 degree dog-ear away from the selvage edge for all T-joints.

- L. For low-slope areas where the roof slope falls below 1/4 in per foot, and where otherwise specified, leave all membrane side and end-laps dry in order to hot-air weld or torch all laps watertight. Embed granules, where present, when heat welding sheets.
- M. Use a follow tool, weighted roller or broom the leading edge of the membrane to the substrate, working forward and outward as necessary to remove wrinkles. Avoid walking over the membrane during application.
- N. Each day, physically inspect all side and end-laps, and ensure the membrane is sealed watertight. Where necessary, use a torch or hot-air welder and a clean trowel to ensure all laps are fully sealed.
- O. Inspect the installation each day to ensure the plies are fully adhered. Repair all voids, wrinkles, open laps and all other deficiencies.
- P. Offset cap sheet side and end-laps away from the base ply laps so that cap sheet laps are not located within 18 in of base ply laps.
- Q. Immediately broadcast matching granules into adhesive bleed-out at cap sheet laps, or otherwise treat bitumen bleed-out once adhesive has dried and cured.

3.11 FLASHING APPLICATION, HEAT WELDED

- A. Refer to SBS manufacturer's membrane application instructions, flashing detail drawings, and follow product data sheets and other published requirements for installation instructions. Refer to manufacturer's membrane flashing detail drawings.
- B. The contractor is responsible for project safety. Refer to NRCA CERTA recommendations and building owner requirements for hot work operations.
- C. Where required to seal substrates for fire safety, install specified adhered, self-adhered or fastened backer ply to the substrate. Ensure backer-ply covers and seals all substrates requiring protection from exposure to torch operations.
- D. Ensure all flashing substrates that require primer are primed, and the primer is fully dry.
- E. Unroll the flashing base ply and flashing cap sheet onto the roof surface to their complete length. Once relaxed, cut the membrane to the required working lengths to accommodate the flashing height, cants and the required over-lap onto the horizontal roof surface.
- F. Cut the flashing membrane from the end of the roll in order to always install flashings to the side-lap line or selvage edge line.

- G. Lay out the flashing base ply and flashing Cap Sheet to offset all side-laps a minimum of 12 inches so that side-laps are never aligned on top of the ply beneath. Shingle the flashing ply laps to prevent back-water laps.
- H. Install non-combustible cant strips at transitions where required.
- I. Ensure correct membrane and flashing sequencing to achieve redundant, multi-ply, watertight flashings.

3.12 ROOF MEMBRANE BASE PLY INSULATION

- A. Before installing flashings, install the roof membrane base ply in the horizontal field of the roof, and extend the base ply up to the top of the cant, where present, at roof terminations, transitions and penetrations.

3.13 FLASHING BASE PLY:

- A. Install the flashing base ply starting at the top leading edge of the vertical flashing substrate, down over the cant and onto the horizontal surface of the roof a minimum of 3 inches beyond the of base of the cant onto the roof. Cut the base ply at corners to form 3 inch side-laps. Install gussets to seal corner transitions.
- B. Install one or more flashing base ply(s) at all roof terminations, transitions and penetrations.

3.14 ROOF MEMBRANE CAP SHEET:

- A. Install the roof membrane Cap Sheet in the horizontal field of the roof over the flashing base ply up to the roof termination, transition or penetration, and up to the top of cants where present.
- B. Using a chalk line, mark a line on the membrane cap sheet a minimum of 4 inches from the base of the cant onto the roof. Where granules are present, embed the cap sheet granules using a torch and trowel or granule embedder to prepare the surface to receive the flashing cap sheet.

3.15 FLASHING CAP SHEET:

- A. Install the flashing Cap Sheet starting at the top leading edge on the vertical substrate, over the cant and onto the roof surface 4 inches from the base of the cant onto the roof.
- B. Install the flashing Cap Sheet to ensure a minimum two (2) ply flashing system is present at all roof terminations, transitions and penetrations.

- C. During the membrane and flashing installation, ensure all plies are completely adhered into place, with no bridging, voids or openings. Ensure bitumen or flashing cement bleed-out is present at all flashing side and end-laps.
- D. Use a damp sponge float or damp rag to press-in the heat-welded flashing plies during installation.
- E. Where sufficient bitumen bleed-out is not present, and for all self-adhered plies, apply specified gun-grade sealant or mastic to seal the membrane termination along all roof terminations, transitions and penetrations. These include gravel stop edge metal, pipe penetrations, along the top edge of curb and wall flashing, and all other flashing terminations where necessary to seal flashings watertight.
- F. Fasten the top leading edge of the flashing 8 in on-centers with appropriate 1 in metal cap nails or other specified fasteners and plates. Seal fastener penetrations watertight using specified sealant or mastic.
- G. Manufacturer's liquid-applied, reinforced flashing systems shall be installed where conditions are not favorable to install SBS modified bitumen flashings. Such conditions include irregular shapes penetrating roof surfaces (I-beams), confined areas and low flashing heights. Manufacturer's liquid-applied, reinforced flashing systems are recommended in lieu of pitch pans and lead pipe flashings.
- H. Refer to manufacturer's installation guidelines for FLASHING INSTALLATION.
- I. For SBS modified bitumen flashings that are self-adhesive, heat-welded, installed using hot asphalt or SOPREMA COLPLY EF adhesive and/or flashing cement, refer to manufacturer's installation guidelines for SOPREMA ALSAN FLASHING and SOPREMA ALSAN RS.

3.16 WALKWAYS

- A. At areas outlined on the drawings, and around the perimeter of all rooftop equipment and at all door and stair landings, install walkway protection.
- B. Cut walkway from end of rolls. No piece shall be less than 24 in.
- C. Spot adhere walkway protection with SOPREMA SOPRAMASTIC SP1.
- D. Provide a 2 in space between sheets for drainage.

3.17 CLEAN UP

- A. Clean-up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

3.18 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
1. Owner: **<Insert name of Owner>**.
 2. Address: **<Insert address>**.
 3. Building Name/Type: **<Insert information>**.
 4. Address: **<Insert address>**.
 5. Area of Work: **<Insert information>**.
 6. Acceptance Date: _____.
 7. Warranty Period: **<Insert time>**.
 8. Expiration Date: _____.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Roofing Installer will, at Roofing Installer's own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. peak gust wind speed exceeding **<Insert mph (m/s)>**;
 - c. fire;
 - d. failure of roofing system substrate, including cracking, settlement, excessive e. deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 - h. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

- E. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 - F. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 - G. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 - H. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
 - I. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
 - J. WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.
1. Authorized Signature: _____.
 2. Name: _____.
 3. Title: _____.

END OF SECTION 075216



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Video Pipe Inspection Report

JOB LOCATION	NAME Lammey & Giorgio		JOB START DATE 02/04/2020		COMPLETION DATE 02/12/2020	
	ADDRESS		POINT OF ENTRANCE: Basement		DIRECTION OF FLOW: <input checked="" type="checkbox"/> WITH <input type="checkbox"/> AGAINST	
	CITY Trenton	STATE NJ	ZIP 08618	TECHNICIAN: Bob Bader		
	HOME PHONE 856-833-0010 Michael					

Video Pipe Inspection Log

CODE	DESCRIPTION	CODE	DESCRIPTION	CODE	DESCRIPTION
ABS	Plastic Pipe	TER	Terracotta Pipe	CT	Curb Trap
CI	Cast Iron Pipe	WF	With Flow	MH	Man Hole
OB	Orange Berg Pipe	AF	Against Flow	SC	Service Connection
PVC	Plastic Pipe	CO	Clean Out	TR	Transition

Starting Footage	Code	Description
0'	CO	From cleanout in the wall in the file room to 132' which ended in the boiler room where it ties into the main from the other side of the building via a wye. We also see the outside window well drain dumping into the line at about where the outside of where the dog kennel was as indicated by the maintenance personnel on site.
132'		
0'	CO	From the trap in the generator room, after the plumber from the state free'd the trap by breaking up scaling in the pipe. I was able to camera up to 78' where it was located in the men's bathroom where another cleanout was found inside the wall. We then ran the camera from that point to approximately 70' into the boiler room where it dumps into the main tie in where they all head to the main via a wye. The location is in the floor
148'		
Roots		Two lines were found to be compacted by root infiltration as well as believed to have broken traps and section of pipe. 1. First drain is in a window well facing capital street in the bushes. 2. Is right around the corner from the aforementioned drain on the side of the building.
Final		All drains meet in the basement, from that point the drains tie in together and exit the basement to Hanover Street. The flow was verified using dye tablets placed in drain lines in the basement then exposing manhole on Hanover Street. Line is showing a combined system of sewer and storm given the bathrooms tie into the rest of the drainage system and exit together to Hanover Street. Drain 1 had some root



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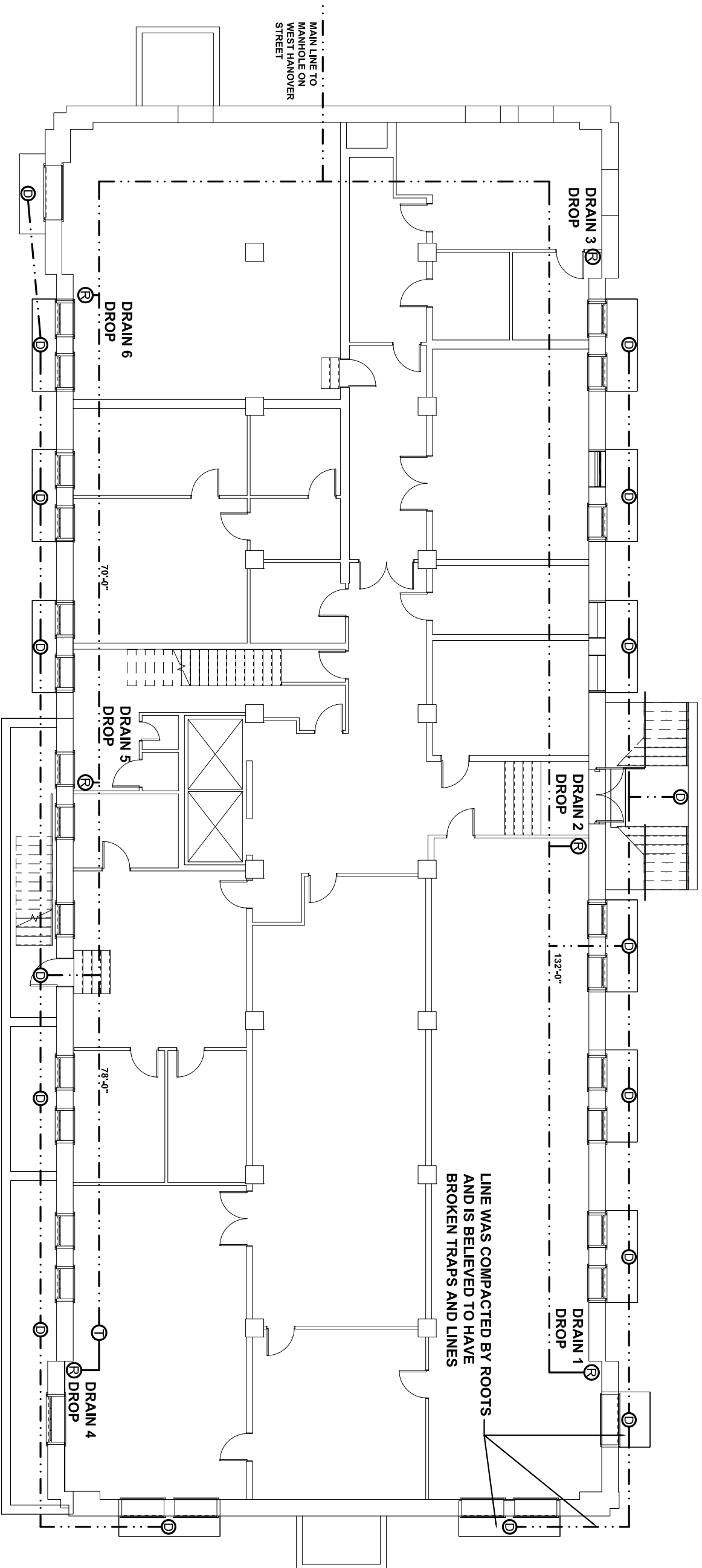
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1. All drains on the roof are free flowing and are in good condition.
2. The window well drains were clogged at the time of inspection. The drain lines were jetted to dislodge and clear obstructions. All window drains are now free flowing and are in good condition, except for the two lines that were found to be compacted by root infiltration. This area is also believed to have two broken traps and one broken section of pipe. The first drain is in the window well facing capital street in the bushes. The second drain is in the window well right around the corner from the aforementioned drain on the side of the building. Repair of the broken traps and drain line in this area is recommended.

LEGEND

- DRAIN LINE
- Ⓜ ROOF DRAIN
- Ⓞ WINDOW WELL DRAIN
- Ⓣ TRAP



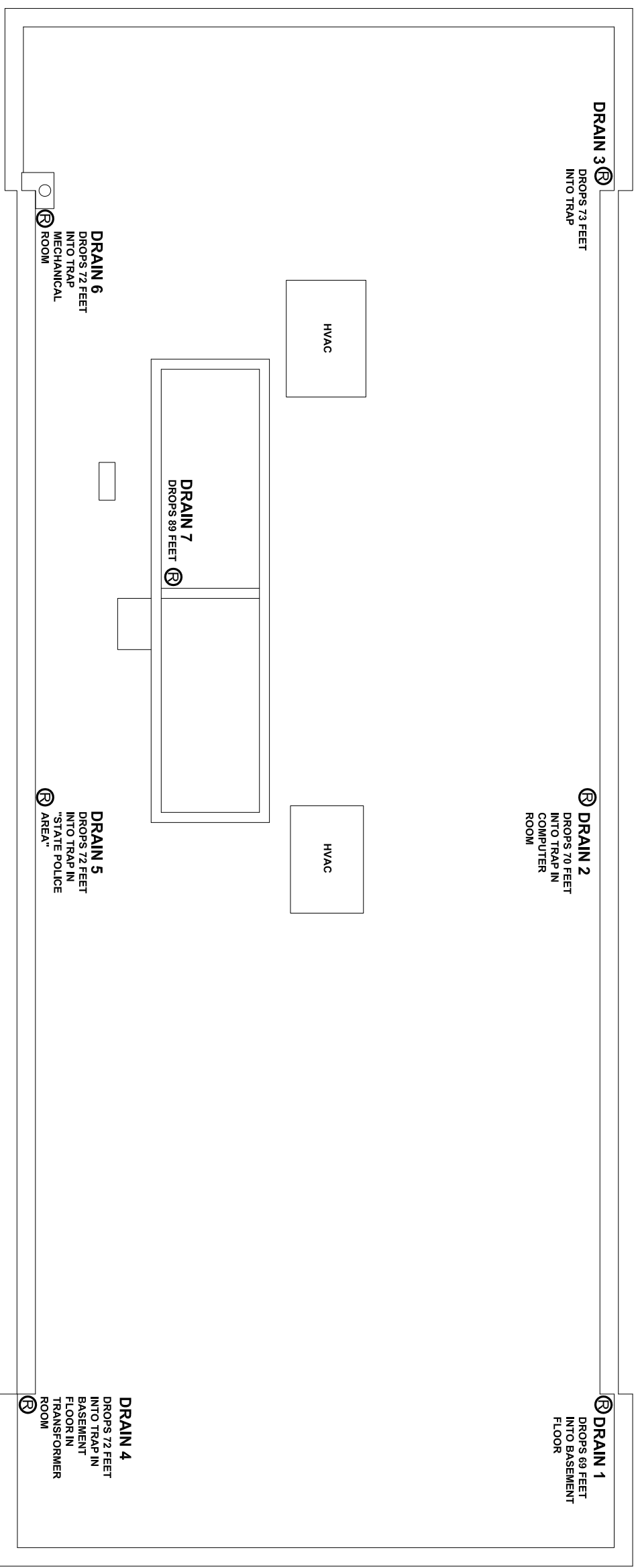
BASEMENT PLAN
 NO SCALE



DRAIN INVESTIGATION
02/04/2020 - 02/12/2020

LEGEND

---	DRAIN LINE
Ⓜ	ROOF DRAIN
Ⓞ	WINDOW WELL DRAIN
Ⓟ	TRAP



ROOF PLAN
NO SCALE



SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Manufactured termination bars with snaplock receiver.
2. Counterflashings..
3. Formed metal copings.
4. Scuppers, overflow and connected to downspouts.
5. Underlayment materials for galvanic protection.

- B. Related Requirements:

1. Division 06 Section "Rough Carpentry", for wood nailers, curbs, and blocking.
2. Division 07 Section "Modified Bitumen SBS Roofing".
3. Division 08 Section "Hollow Metal Doors & Frames"; for Underlayment Materials – Galvanic Protection.
4. Division 08 Section "Aluminum Framed Entrances"; for Underlayment Materials – Galvanic Protection.
5. Division 08 Section "Single Hung Wood Windows"; for Underlayment Materials – Galvanic Protection.

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.

3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: For sheet metal flashing and trim.
 1. Include plans, elevations, sections, and attachment details.
 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 6. Include details of termination points and assemblies.
 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 8. Include details of roof-penetration flashing.
 9. Include details of edge conditions, termination bars and counterflashings as applicable.
 10. Include details of special conditions.
 11. Include details of connections to adjoining work.
 12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches .
- C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- D. Samples for Verification: For each type of exposed finish.
 1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
 3. Copings: Exterior corner (12-inch on each side) indication construction, fasteners, and sample of welded corner.
 4. Copings: Typical concealed joint: 12-inch long section indicating construction, fasteners, concealed joint, etc.
 5. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
 6. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of coping and flashing.
- C. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. For copings and roof edge flashings, shop shall be listed as able to fabricate required details as tested and approved.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof coping and termination bar/counterflashings, approximately 10 feet (3.0 m) long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. FM Approvals Listing: Manufacture and install copings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping. Second option in "Aluminum Sheet" Paragraph below may diminish oil-canning effect.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with embossed surface.

1. Exposed Coil-Coated Finish:
 - a. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions. Retain "Color" Subparagraph below for factory-coil-coated finish.
2. Color: As selected by Architect from manufacturer's full range.
3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

2.3 UNDERLAYMENT MATERIALS – GALVANIC PROTECTION

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

- D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187..

2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Copings: Aluminum copings specifically designed to withstand SPRI/FM 4435 ES-1 Wind Design Standard. Basis of Design: “Permasnap 2 Parapet Wall coping” as manufactured by Hickman. Products manufactured by the following that meet or exceed the requirements of the Basis of Design product will be considered:
 - 1. Architectural Products, Inc.
 - 2. Northern Manufacturing Co.
 - 3. Petersen Aluminum.
 - 4. Or approved equal.
 - a. Aluminum Thickness: 0.63-inch thick.
 - b. Support Cleat: 16-gauge galvanized steel with 26 gauge stainless steel spring.
 - c. Joint Cover: Concealed type, 6-inches wide with pre-finished channel on top surface to channel water.
 - d. Corners: Fully welded.
 - e. Lengths: 10-feet typical; shortest length allowable is 4-feet.
 - f. Front and Back Coping Legs: As indicated on drawings.
 - g. Wind Category Warranty: 25-year, 155 MPH Category 5 Warranty.
 - h. UL Classification: ANSI/SPRI ES-1.
 - i. Finish: Kynar 500; color as selected by Architect from full range of available colors.
- B. Termination Bars/Surface Mounted Reglets: Basis of Design is Frye Reglet Architectural Metals Company Model “SM” Surface Mounted Reglet. Products manufactured by the following that meet or exceed the requirements of the Basis of Design product will be considered:
 - 1. Hickman.
 - 2. Hohmann & Barnard.
 - 3. W.R. Meadows.
 - 4. Or approved equal.
 - a. Material: Aluminum.
 - b. Thickness: 0.40-inch.
 - c. Finish: Polyester coating; grey color.
- C. Overflow Scuppers: Stainless steel sheet, ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.

1. Finish: ASTM A480/A480M, No. 2D, dull, cold rolled, profiles indicated on drawings.
- D. Scuppers Connected to Downspouts: Stainless steel sheet, ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.
1. Finish: ASTM A480/A480M, No. 2D, dull, cold rolled, profiles indicated on drawings.
- E. Downspouts: Stainless steel sheet, ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.
1. Finish: ASTM A480/A480M, No. 2D, dull, cold rolled, profiles indicated on drawings.

2.6 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 2. Obtain field measurements for accurate fit before shop fabrication.
 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

- H. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- I. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- J. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- K. Do not use graphite pencils to mark metal surfaces.

2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, weld watertight. Shop fabricate interior and exterior corners.
 - 1. Coping Profile: As indicated.
 - 2. Joint Style: Butted with expansion space and 6-inch- (150-mm-) wide, concealed backup plate.
 - 3. Fabricate from the Following Materials:
 - a. Aluminum: 0.063 inch thick.
- B. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
 - 1. Aluminum: 0.032 inch (0.81 mm) thick.
- C. Flashing Receivers: Fabricate from the following materials:
 - 1. Aluminum: 0.040 inch thick.
- D. Roof-Penetration Flashing: Fabricate from the following materials:
 - 1. Copper: 16 oz./sq. ft. (0.55 mm thick).
- E. Roof-Drain Flashing: Fabricate from the following materials:
 - 1. Copper: 12 oz./sq. ft. (0.41 mm thick). Retain paragraphs in this article to suit Project. Although the most common fabrications are included, insert descriptions of others if required.
- F. Overflow Scuppers: Fabricate to dimensions indicated, with closure flange trim to exterior, 4-inch wide wall flanges to interior, and base extending 4-inches beyond cant or tapered strip onto field of roof.
 - 1. Stainless Steel: 0.019-inch thick minimum.
- G. Scuppers Connected to Downspouts: Fabricate to dimensions indicated, with closure flange trim to exterior, 4-inch wide wall flanges to interior, and base extending 4-inches beyond cant or tapered strip onto field of roof.

1. Stainless Steel: 0.019-inch thick minimum.
- H. Downspouts: Fabricate to dimensions indicated with mitered elbows and matching fastening brackets.
1. Stainless Steel: 0.019-inch thick.

2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following materials:
1. Copper: 16 oz./sq. ft. (0.55 mm thick).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
1. Verify compliance with requirements for installation tolerances of substrates.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION AND GALVANIC PROTECTION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.
- B. Install underlayment as galvanic protection between dissimilar metals at hollow metal door frames, aluminum frames and windows to insure material separation. Install so that there are no joints between dissimilar metals.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective

coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
 6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
- H. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.
- C. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification. Comply with manufacturer's installation requirements for 155 MPH Category 5 Warranty.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of snap-in installation and sealant unless otherwise indicated.
- F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Surface Mounted Reglets: Install in accordance with manufacturer's recommendations. Anchor to wall surfaces at 32-inches on center maximum.

3.6 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.
- B. Overhead-Piping Safety Pans: Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

3.7 INSTALLATION OF OTHER ITEMS

- A. Overflow and Scuppers Connected to Downspouts:
 - 1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
 - 2. Anchor scupper closure trim flange to exterior wall and solder to scupper. Seal with elastomeric sealant.
 - 3. Loosely lock front edge of scupper with conductor head.
 - 4. Solder and elastomeric seal exterior wall scupper flanges into back of conductor head.
- B. Downspouts:
 - 1. Join sections with 1-1/2-inch (38-mm) telescoping joints.
 - 2. Provide hangers with fasteners designed to hold downspouts securely to walls.
 - 3. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.
 - 4. Provide elbows at base of downspout to direct water away from building.
 - 5. Connect downspouts to underground drainage system.

3.8 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.9 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On

completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes joint sealants for the applications indicated in the Joint-Sealant Schedule at the end of Part 3.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

2. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
3. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
4. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Multi-component Non-sag Urethane Sealant:
 1. Available Products:
 - a. Pecora Corporation; Dynatrol II.
 - b. Tremco; Dymeric 511.

- c. Tremco; Vulkem 922.
- d. Approved equal.
2. Type and Grade: M (multi-component) and NS (non-sag).
3. Class: 50.
4. Use Related to Exposure: NT (non-traffic).

2.4 PICK-PROOF SEALANT

- A. Use Pick-Proof Sealants at exterior conditions from grade to a height of 8-feet above grade.
- B. Pick-proof adhesive/sealant, clear, high-strength, hard setting, one-part, weather resisting, paintable; meet or exceed the following standards:
 1. ASTM C679, ASTM D412, ASTM D624.

2.5 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), O (open-cell material), B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A.. Joint-Sealant Application JS-#1: Exterior perimeter joints between metals.
1. Joint Sealant: Multicomponent nonsag urethane sealant.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- B. Joint-Sealant Application JS-#2: Exterior perimeter joints between metal and masonry.
1. Joint Sealant: Multicomponent nonsag urethane sealant.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range

- C. Joint-Sealant Application JS#3: Exterior control and repair joints a brick, concrete, stone, and other exterior masonry type surfaces:
1. Joint Sealant: : Multicomponent nonsag urethane sealant.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION 07920

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes hollow-metal work.
- B. Related Requirements:
 - 1. Division 8 Section "Door Hardware" for door hardware for hollow-metal doors.
 - 2. Division 8 Section "Sheet Metal Flashing & Trim"; for Underlayment Materials - Galvanic Protection.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 SECTION REQUIREMENTS

- A. Assembly Maximum U-Factor: U-0.77

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.
 - 5. Details of each different wall opening condition.

6. Details of anchorages, joints, field splices, and connections.
 7. Details of accessories.
 8. Details of moldings, removable stops, and glazing.
 9. Details of conduit and preparations for power, signal, and control systems.
- C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Door Type "D" as noted on Door Schedule: Basis of Design is Ceco "Mercury Energy Efficient Door and Thermal Break Frame" or approved equal. Subject to compliance with requirements, the following manufacturers will be considered:
1. Commercial Door & Hardware Inc.
 2. Curries Company; an Assa Abloy Group company.
 3. North American Door Corp.
 4. Pioneer Industries, Inc.
 5. Or approved equal.
- B. Door Type "E" as noted on Door Schedule: Basis of Design is Ceco "Trio-E" or approved equal. Subject to compliance with requirements, the following manufacturers will be considered:
1. Commercial Door & Hardware Inc.
 2. Curries Company; an Assa Abloy Group company.
 3. North American Door Corp.
 4. Pioneer Industries, Inc.
 5. Or approved equal.
- C. Frame Type "D" as indicated on Door Schedule: Basis of Design is Ceco "Mercury Series TQB and TRB Thermal Break Frames" or approved equal. Subject to compliance with requirements, the following manufacturers will be considered:

1. Commercial Door & Hardware Inc.
2. Curries Company; an Assa Abloy Group company.
3. North American Door Corp.
4. Pioneer Industries, Inc.
5. Or approved equal.

D. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Commercial Doors and Frames: NAAMM-HMMA 861. At locations indicated in the Door and Frame Schedule.

1. Physical Performance: Level A according to SDI A250.4.
2. Door Type "D" as indicated on Door Schedule:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: 16 gauge face sheets with 16 gauge inverted end channels welded to both face sheets.
 - d. Closer reinforcement: 14-gauge
 - e. Materials: cold-rolled or galvanized steel.
 - f. Core: 22 gauge steel stiffeners spaced 6-inches apart with injected polyurethane foam.
 - g. Edge Construction: Mechanically interlocked, hemmed vertical edge seams.
 - h. Hardware reinforcements: 7 gauge steel hinge reinforcement and reinforcing for specified locks.
 - i. Paint: Electrostatically applied prime base coat.
 - j. Thermal Performance: The Door Assembly U-factor shall be 0.37 when tested in accordance with ASTM 1362.
 - k. Embossed panel design as indicated.
3. Door Type "E" as indicated on Door Schedule:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: 16 gauge face sheets with 16 gauge inverted end channels welded to both face sheets.
 - d. Closer reinforcement: 14-gauge
 - e. Materials: cold-rolled or galvanized steel.
 - f. Core: 22 gauge steel stiffeners spaced 6-inches apart with injected polyurethane foam.
 - g. Edge Construction: Mechanically interlocked, hemmed vertical edge seams.
 - h. Hardware reinforcements: 7 gauge steel hinge reinforcement and reinforcing for specified locks.

- i. Paint: Electrostatically applied prime base coat.
 - j. Thermal Performance: The Door Assembly U-factor shall be 0.36 when tested in accordance with ASTM 1362.
4. Frames - Type "D" as indicated on Door Schedule:
- a. Materials: Fabricated of 14 gauge hot-dipped zinc coated steel that complies with ASTM A 653.A 653M, Coating Designation A60.
 - b. Construction: Full profile welded.
 - c.. Exposed Finish: Prime.

2.3 FRAME ANCHORS

A. Jamb Anchors:

- 1. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

2.4 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

- I. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.5 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. All fire doors and frames shall be fabricated in accordance with NFPA 80.
- C. Hollow-Metal Doors (Fully Welded):
 - 1. Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.
 - 2. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
 - 3. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
 - 4. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 - 5. Astragals: Provide overlapping astragal on one leaf of pairs of doors. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
- D. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
 - 4. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- E. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

- F. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

2.8 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Install galvanic protection underlayment materials specified in Division 07 Section "Sheet Metal Flashing & Trim between dissimilar metals.

- C. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 2. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 3. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- D. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Fire-Rated Steel Doors: Install in accordance with NFPA 880.
 2. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
 - c. At Bottom of Door: 3/4 inch plus or minus 1/32 inch.
 - d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 081433 – WOOD DOOR RESTORATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including State of New Jersey Instructions to Bidders and General Conditions, and other Division 1 Specification Sections apply to this Section.
- B. Division 08 Section “Door Hardware”.

1.2. WORK INCLUDED

- A. Work includes the in-place restoration of the existing door No. 1, including but not limited to the following:
 - 1. Restore door, frame and hardware.
 - 2. Restore associated casings, moldings and trim.
 - 3. Put hardware into good operating condition.

1.3. ACTION SUBMITTALS

- A. Product Data on all materials that are planned for use. Shall be submitted for approval.
- B. Work Sequence and Protection: Submit written plan for approval.
- C. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- D. Product Data: For each type of product indicated.
- E. Replacement Member Shop Drawings: Show fabrication and installation of replacement wood members. Indicate materials and profiles of each replacement member, joinery, finish, and method of splicing or attaching to existing.
- E. Samples for Verification: For each type of replacement component required, prepare Samples of minimum lengths of 18-inches in the matching size and thickness.
 - 1. Repaired and Refinished Components: Prepare Samples using existing wood members, prepared and repaired with patching compound, and refinished.
 - 2. Hardware: Full-size units with factory-applied finish for damaged or unusable hardware..
 - 3. Weather Stripping: 12 inch long sections.
- G. Qualification Data: For historic treatment specialists.
- H. Historic Treatment Program: For each phase of historic treatment process, including protection of surrounding materials on the building and Project site during operations.

Describe in detail the materials, methods, equipment, and sequence of operations to be used for each phase of historic treatment work.

1. If materials and methods alternative to those indicated are proposed for any phase of historic treatment work, provide a written description, including evidence of successful use on other comparable projects, and a testing program to demonstrate their effectiveness for this Project.

1.5 QUALITY ASSURANCE

- A. Historic Treatment Specialist Qualifications: A firm or individual experienced in historic treatment of windows similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
 1. Field Supervision: Require that an experienced full-time supervisor be at Project site during times that historic treatment of wood windows is in progress.
- B. Mockups: Prepare sections of doors, frames, casings, trim, hardware, etc. to serve as a mockup to demonstrate historic treatment methods and procedures for aesthetic effects and qualities of materials and execution. Use materials and methods proposed for completed Work.
 1. Doors: One (1) 24 x 36-inch section of door.
 2. Frame, casings, moldings and trim: One (1) 24-inch long section of each.
 3. Hardware: One (1) of each hardware type.
- C. AWI Quality Standard: Comply with applicable requirements in AWI's "Architectural Woodwork Quality Standards" for construction, finishes, grades of wood windows, and other requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver miscellaneous patching and repair compounds, and repaired windows to Project site in manufacturer's original and unopened containers, labeled with description of contents and name of manufacturer.
- B. Comply with manufacturer's written instructions for minimum and maximum temperature requirements for storage of patching materials.

1.7 SEQUENCING AND SCHEDULING

- A. Perform historic treatment of wood windows in the following sequence:
 1. Prepare components for restoration.
 2. Repair deteriorated and damaged wood members.
 3. Reglaze existing door lites and transom.
 4. Repair all components.
 5. Repair or replace existing hardware.
 6. Install new weather stripping.
 7. Apply finishes.
 8. Mount hardware
 9. Test and adjust door and hardware operation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to products specified.
 2. Products: Subject to compliance with requirements, provide one of the products specified.
 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified in other sections.
 4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 REPLACEMENT WOOD MATERIALS

- A. Wood for all Components (except where noted otherwise): Clear, fine-grained lumber; kiln dried to a moisture content of 6 to 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch deep by 2 inches wide; and treated with water-repellent preservative.
1. Species: Mahogany.
- B. Exterior Trim and Frame Parts, Including Heads and Jambs: Mahogany
- C. Exterior and Interior Trim: Mahogany.

2.3 WOOD PATCHING MATERIALS

- A. Wood Pretreatment: Ready-to-use product designed for hardening and sealing soft fibers of wood materials that have deteriorated due to weathering and exposure and designed specifically to enhance the bond of wood patching compound to existing wood.
1. Available Products:
 - a. Abatron, Inc.; Liquidwood.
 - b. Advanced Repair Technology; Primatrate.
 - c. Wood Care Systems; Liquid TIMBR.
- B. Wood Patching Compound: 2-part epoxy-resin wood compound with a 10- to 15-minute cure at 70 deg F, in knife grade formulation and recommended by manufacturer for type of wood repair indicated. Compound shall be designed for filling damaged wood materials that have deteriorated due to weathering and exposure. Compound shall be capable of filling deep holes and capable of spreading to feather edge.
1. Available Products:
 - a. Abatron, Inc.; Liquidwood with WoodEpoxy.
 - b. Advanced Repair Technology; Primatrate with Flex-Tec HV.
 - c. Gougeon Brothers, Inc.; West System.

- d. Polymeric Systems Inc.; Quickwood.
- e. Wood Care Systems; Liquid TIMBR with TIMBR Flex.

2.4 GLAZING MATERIALS

- A. Glazing System: Provide oil-based glazing putty and glazing points.

2.5 HARDWARE

- A. Butts: Repair and Refinish existing.
- B. Exit Devices, Cylinders, Trim, Closers, Weatherstripping, and Door Bottom: Refer to Division 08 Section "Door Hardware".

2.6 MISCELLANEOUS MATERIALS

- A. Cleaning Materials:
 - 1. Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium polyphosphate (TSPP), ½ cup of laundry detergent, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for each 5 gal. of solution required.
 - 2. Mildewcide: Provide commercial proprietary mildewcide or a solution prepared by mixing 1/3 cup of household detergent, 1 quart of 5 percent sodium hypochlorite bleach, and 3 quarts of warm water.
- B. Adhesive: Wood adhesive with a 15- to 45-minute cure at 70 deg F, in gunnable formulation and recommended by adhesive manufacturer for exterior wood repair.
- C. Anchors, Clips, and Accessories: Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel complying with requirements in ASTM B 633 for SC 3 (Severe) service condition.

2.7 FABRICATION OF REPLACEMENT MEMBERS

- A. General: Fabricate replacement members and units to comply with AWI Section 1000 requirements for Custom grade and to match existing sizes, thicknesses and profiles.
 - 1. Fabricate replacement components and dutchmen to sizes and profiles of existing.
 - 2. Glazing Stops: Provide replacement glazing stops coordinated with glazing system; to match existing.
 - 3. Molded Profiles of Replacement Members: Match existing profiles.
 - 4. Frame Members: Dado, rabbet, and plant assemble.
 - 5. Ease edges of replacement members as necessary to match existing members.

PART 3 - EXECUTION

3.1 HISTORIC TREATMENT PROCEDURES, GENERAL

- A. Identify removed components with numbering system to ensure reinstallation in same location. Key components to Drawings showing location of each removed unit. Mark units in a location that will be concealed after reinstallation.

3.2 GENERAL REQUIREMENTS

- A. Protect adjacent materials from damage caused by historic treatment of wood windows
- B. Remove doors and provide a temporary weatherproof barrier while doors are being restored.
- C. Remove all existing door hardware from doors and frames.
- D. Clean the components to be restored prior to initiating work.
- E. Use an orbital sander to remove existing varnish and sun-baked wood flakes. Initial sanding should be with an 80-grit paper followed by passes with 100-grit and 120-grit paper.
- F. Scrape moldings using small, razor sharp scrapers that are designed for this work. Extend into corners, across narrow profiles, and on the end grain of raised panels. Pull the scraper with the grain and apply gentle downward pressure. Trapezoidal scrapers for flat sections, and teardrop type for narrow crevices should be utilized.
- G. Hand-sand profiles using sanding sponge to sections of the profile such as inside corners.

3.3 REPAIR AND PATCHING

- A. Allow wet wood to thoroughly dry prior to initiating any repair and patching work.
- B. Patch wood members that have been damaged and exhibit depressions, holes, or similar voids, and that have limited rotted or decayed wood. Remove rotted or decayed wood down to sound wood.
 - 1. Clean wood surfaces prior to consolidation treatment and patching.
 - 2. Treat wood members with wood pretreatment prior to application of patching compound according to repair and patching material manufacturer's written instructions.
 - 3. If rotted or soft wood remains, remove down to sound wood according to patching manufacturer's written instructions.
 - 4. Use hand molds to duplicate missing sections and profiles.
 - 5. Apply wood pretreatment to soft wood fibers to remain, complying with manufacturer's written instructions. Coat surface of wood with consolidation treatment by brushing, applying multiple coats until wood is saturated. Allow treatment to harden before filling void with patching compound.
 - 6. Mix only as much patching compound as can be applied according to manufacturer's written instructions.
 - 7. Apply patching compound to fill depressions, nicks, cracks, and other voids created by removed or missing wood. Apply compound in layers as recommended in writing by manufacturer until the void is completely filled. Sand patching compound smooth and flush and matching contour of existing wood member.

8. Clean spilled compound from adjacent materials immediately.

3.4 WOOD WINDOW MEMBER REPAIR AND REPLACEMENT OF DETERIORATED COMPONENTS

- A. Repair by Wood Member Replacement: If approved by the State and Architect, custom fabricate new wood members to replace missing members or members deteriorated beyond repair. Wherever possible splice new wood member into existing member; size and profiles shall match existing. If Contractor believes that entire member must be replaced they shall notify the State and Architect for review and approval.
- B. Cut out deteriorated or damaged sections of wood members and replace them by splicing replacement wood members into existing remaining wood members.
 1. Anchor new wood members by nailing and adhesive.
 2. Install wood members with concealed fasteners. Fill nail holes and touch up the finish to match surrounding wood finish.
- C. Glazing: Remove and mill existing glazed members to accommodate existing glass thickness. Brush glazing recesses with boiled linseed oil prior to the application of bed glazing compound.
- D. Before reglazing apply a bead of linseed oil putty around the rabbet to cushion and seal the glass. Press glass into place and push glazing points into the wood around the perimeter of the glass pane.
- E. Apply an additional layer of glazing compound or putty and bevel. Painting can be completed once the glazing compound has developed a "skin".
- F. Coordinate repairs or replacement with sanding preparation to remove existing finish and

3.5 WEATHERIZATION

- A. Apply weatherstripping.
- B. Prime, back-prime, stain and seal in accordance with Division 09 Section - Exterior Painting.

3.6 ADJUSTMENT

- A. Adjust existing and replacement components to provide a tight fit at contact points and with weather stripping, and to provide smooth operation and a weathertight closure. Lubricate hardware and moving parts as necessary.

3.7 CLEANING AND PROTECTION

- A. Protect restored window surfaces from contact with contaminating substances resulting from construction operations.
- B. Monitor restored surfaces adjacent to exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants.

If contaminating substances contact window surfaces, remove contaminants immediately according to glass manufacturer's written recommendations.

- C. Clean exposed surfaces immediately after historic treatment of components is completed. Avoid damaging coatings and finishes. Remove excess sealants, glazing and patching materials, dirt, and other substances.
- D. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period after approval by the State and Architect.

3.9 REPAIR SCHEDULE

- A. Conduct the following for existing door and frame No.1:
 - 1. Follow Historic Treatment Procedures and General Requirements.
 - 2. Remove and reinstall existing glazing.
 - 3. Stabilize, repair and patching of all deteriorated doors, frames, casings, moldings, trim, and other components.
 - 4.. Partial component replacement where deteriorated beyond the ability to repair.
 - 5. Reglazing using existing glass.
 - 6. Replace all deteriorated wood casings and trim with products of specified species, and size, profile, and thickness to match existing.
 - 7. Repair butts to an operating condition. Replace hardware that is deteriorated beyond repair.
 - 8. Replace all weatherstripping and adjust operation.
 - 9. Clean and protect glass.
- C. Refer to Bid Proposal Form for estimated quantities and Unit Prices to be included In Contractor's Bid.

END OF SECTION 081433

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Structural Performance: Provide systems, including anchorage, capable of withstanding loads indicated.
 - 1. Main-Framing-Member Deflection: Limited to 1/175 of clear span or 3/4 inch (19 mm), whichever is smaller.
 - 2. Structural Testing: Systems tested according to ASTM E 330 at 150 percent of inward and outward wind-load design pressures do not evidence material failures, structural distress, deflection failures, or permanent deformation of main framing members exceeding 0.2 percent of clear span.
- B. Air Infiltration: Limited to 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of system surface area when tested according to ASTM E 283 at a static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa).
- C. Water Penetration: Systems do not evidence water leakage when tested according to ASTM E 331 at minimum differential pressure of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- D. Assembly Maximum U-Factor: U-0.77
- E. Submittals: Product Data, Shop Drawings, and color Samples.
 - 1. For entrance systems, include hardware schedule and locations.

1.2 RELATED DOCUMENTS

- A. Division 07 Section "Sheet Metal Flashing & Trim"; for Underlayment Materials – Galvanic Protection.

PART 2 - PRODUCTS

2.1 ALUMINUM-FRAMED ENTRANCES

- A. Available Products: Basis of Design - Kawneer; TriFab, VersaGlaze 451 with 2 inch sightline; thermal break option; and Standard 500 Wide Stile Entrance, supplied with manufacturer's hardware as indicated herein. Subject to compliance with requirements, products by one of the following will be considered for substitution:
 - 1. EFCO Corporation.
 - 2. Tubelite Inc.
 - 3. Vistawall Architectural Products.

4. Or approved equal.
- B. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated; ASTM B 209 (ASTM B 209M) sheet; ASTM B 221 (ASTM B 221M) extrusions.
- C. Glazing: Insulated safety glazing, Type II Category that complies with CPSC 16 CFR Part 1201.
 1. Provide etched identification label marked "CPSC 16 CFR Part 1201" and shall include the manufacturer and installer.
- D. Sealants and Joint Fillers: For joints at perimeter of systems as specified in Division 07 Section "Joint Sealants."
- E. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
- F. Doors: 1-3/4-inch- (44.5-mm-) thick glazed doors with minimum 0.125-inch- (3.2-mm) thick, extruded tubular rail and wide stile members, mechanically fastened corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie-rods, snap-on extruded-aluminum glazing stops, and preformed gaskets.
 1. Exterior Doors: Provide compression weather stripping at fixed stops. At other locations, provide sliding weather stripping retained in adjustable strip mortised into door edge.

Hardware: Provide and install hardware as specified at the end of this Section. Egress Doors shall be readily openable from the egress side without the use of a key or special knowledge or effort.

 - a. Cylinders: Basis of Design manufacturer's cylinder is Corbin Russwin. Coordinate with Owner's hardware requirements. Other manufacturers who meet the requirements of the specified hardware will also be considered:
 - 1) Schlage Lock Co.
 - 2) Yale.
 - 3) Sargent.
 - 4) Or approved equal.
 - b. Door Closers: Adjustable surface closer with back-check and with barrier-free delayed action and adjustable hold-open.
 - c. Pivots: Single acting; top and bottom offset pivots with intermediate offset pivot.
 - d. Exit Device: Concealed rod exit device for pairs of doors with a mortised type cylinder designed to fit within an intermediate door panel.
 - e. Exit Device Pulls: Architects classic "wire" pull handle.
 - f. Handicapped Accessible Door Openers:
 - g. Threshold: ½ inch x 4 inch (12.7mm x 101.6mm) aluminum mill finish at exterior and vestibule doors only.
 - h. Weatherstripping: Weathering system in the door and frame consisting of a dense, bulb polymeric material, which remains resilient and retains its weathering ability under temperature extremes. Provide with EPDM blade gasket sweep strip applied to the bottom door rail with concealed fasteners.

2.2 FASTENERS AND ACCESSORIES

- A. Fasteners and Accessories: Compatible with adjacent materials, corrosion-resistant, nonstaining, and nonbleeding. Use concealed fasteners.

2.3 FABRICATION

- A. Fabricate framing in profiles indicated for flush glazing (without projecting stops). Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system. Factory assemble components to greatest extent possible. Disassemble components only as necessary for shipment and installation.
 - 1. Door Framing: Reinforce to support imposed loads. Factory assemble door and frame units and factory install hardware to greatest extent possible. Reinforce door and frame units for hardware indicated. Cut, drill, and tap for factory-installed hardware before finishing components. Class I anodic finishes below are heavier than Class II finishes and are recommend for exterior applications.

2.4 FINISH AND COLOR

- A. Aluminum Finish: Comply with NAAMMs "Metal Finishes Manual for Architectural and Metal Products." Color anodic, Architectural Class I: AA-M12C22A42/A44, complying with AAMA 611.
- B. Color: Clear Anodized or Duranodic; as selected by Architect from full range of manufacturer's options.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Isolate dissimilar metal surfaces in accordance with galvanic protection underlayment materials specified in Division 07 Section "Sheet Metal Flashing & Trim".
- B. Install components to provide a weatherproof system.
- C. Install framing components true in alignment with established lines and grades to the following tolerances:
 - a) Variation from Plane: Limit to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
 - b) Alignment: For surfaces abutting in line, limit offset to 1/16 inch (1.5 mm). For surfaces meeting at corners, limit offset to 1/32 inch (0.8 mm).
 - c) Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).
- C. Install doors without warp or rack. Adjust doors and hardware to provide tight fit at contact points and smooth operation.

3.2 ALUMINUM ENTRANCE HARDWARE SCHEDULE

- A. General: Refer to Division 08 Sections “Door Hardware” for hardware for Wood Door Restoration and Hollow Metal Doors.

- B. Products: Note that unless noted otherwise, products listed below are from the Basis of Design manufacturer. Subject to compliance with requirements, products by one of the following will be considered for substitution:
 - 1. EFCO Corporation.
 - 2. Tubelite Inc.
 - 3. Vistawall Architectural Products.
 - 4. Or approved equal.

- B. HW-2; Door No. 2:
 - 1. Pivots: Top, Intermediate, and Bottom with access control capability.
 - 2. Exit Device: “Paneline MEL” Concealed Rod Device x Wire Pull x Cylinder.with access control application. Note that there is an existing access control to this door which shall be retained; any modifications required will be completed by the Owner.
 - 3. Handicapped Door Opener: Basis of Design is ADH “Select Heavy Duty Low Energy Dual Door Opener”. Provide outside and inside activation buttons, and door mounted safety sensor. Subject to compliance with requirements, products by one of the following will be considered for substitution:
 - a. Besam
 - b. LCN Benchmark/Senior Swing
 - c. Stanley Majic Access/Majic
 - d. Or approved equal.
 - 4. Saddle: Handicapped type.
 - 5. Weatherstripping
 - 6. Coordinate with Owner’s existing access control system. Any modifications to the access control system shall be completed by the Owner.

- C. HW-3; Door No. 3:
 - 1. Pivots: Top, Intermediate, and Bottom with access control capability.
 - 2. Exit Device: “Paneline” Concealed Rod Device x Wire Pull x Cylinder.
 - 3. Closer: Handicapped Accessible Type.
 - 4. Saddle: Handicapped type.
 - 5. Weatherstripping.

END OF SECTION 084113

SECTION 085250 – SINGLE HUNG WOOD WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Clad Traditional Single Hung windows complete with hardware, glazing, weatherstripping, screens, jamb extensions, performance divided lites, and standard or specified anchorages, trim, attachments, and accessories.

1.02 RELATED SECTIONS

- A. Division 1 Section – Submittal Procedures.
- B. Division 1 Section - Execution.
- C. Division 6 Section - Rough Carpentry.
- D. Division 7 Section - Joint Sealants.
- E. Division 7 Section – Sheet Metal Flashing & Trim; for Underlayment Materials – Galvanic Protection.

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. ASTM E283-04' - Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
 2. ASTM E330-02' - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 3. ASTM E547-00' - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
 4. ASTM E1425-07' or AAMA 1801 - Certification of Acoustical Performance.
 5. ASTM F588-07' or AAMA 1302.5 - Standard for Forced-Entry Resistance.
 6. AAMA 1423-99, 1503.1-98 and 1504-97 - Standard for Thermal Transmittance.
- B. American Architectural Manufacturers Association/Window and Door Manufacturers Association (AAMA/WDMA), American National Standards Institute/Window and Door Manufacturers Association (ANSI/WDMA), Canadian Standards Association (CSA).
 1. AAMA/WDMA/CSA 101/I.S.2/A440-05', 101/I.S.2/A440-08' Standard / Specification for Windows, Doors and Skylights
 2. WDMA I.S. 4-07'A Water Repellant Preservative Treatment for Millwork
- C. National Fenestration Rating Council (NFRC)
 1. NFRC 100-2004' & 2010' - Determining Fenestration U-Factor.
 2. NFRC 100-2004' & 2010' - Test Procedure for Thermal Transmittance of Fenestration.
 3. NFRC 200-2004' & 2010' Determining Fenestration SHGC & Tv.
 4. ASTM E1423-06' - Determining Thermal Transmittance of Fenestration Systems.
 5. AAMA 1503.1-98 - Test Derived CRF.

6. NFRC 500-2010' - Determining Fenestration Product Condensation Resistance.

D. WDMA Hallmark Program

1. WDMA Hallmark Program Procedural Guide C.S.-1.

E. Consumer Product Safety Commission (CPSC)

1. CPSC 16 CFR 1201 - Safety Glazing Standards.

2. ANSI Z-97.1 - Safety Glazing Standards for Tempered Glass.

1.04 SUBMITTALS

A. Product Data, Shop Drawings, Samples, and Glazing: Submit in accordance with Division 01 Section Submittals.

B. Installation Instructions: Submit in accordance with Division 01 Section Submittals.

C. Quality Control Submittals: Certificates: Submit performance test results reported by independent laboratory or manufacturer's Statement of Qualification indicating compliance with specified performance and design requirements.

1.05 QUALITY ASSURANCE

A. Insulating Glass: Certifications are required from IGCC and IGMAC.

B. Safety Glass: Certification is required from CPSC 16 CFR 1201. Glazing shall comply with the test criteria specified. Provide etched labels.

C. NFRC Certification Program for Energy Rating of Fenestration.

D. WDMA Hallmark Program and Air-Water-Structural Test Reports
<http://www.kolbewindows.com>.

D. IGMAC-Insulating Glass Manufacturer's Association Canada.

E. Mock Up: Provide full size installed sample of Window Type "B" sample for review and approval prior to ordering remainder of windows, including moldings, sealants, and other components to represent a complete installation. If the mock-up window and installation are approved it may remain in place. If not approved it shall be immediately removed or modified prior to ordering the remainder of windows.

1.06 WARRANTY

A. Warranty: Provide manufacturer's limited two year warranty.

PART 2 PRODUCTS

2.01 MANUFACTURED UNITS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Basis of Design: Kolbe & Kolbe Millwork Co., Inc., “Ultra Traditional Double Hungs”, or approved equal. Comparable products that meet or exceed the specifications will be considered, including the following:
 - a. Pella Windows
 - b. Winco Windows
 - c. Or approved equal
2. Energy Performance: Assembly Maximum U-factor =0.33.

2.02 MATERIALS

- A. Frame: Constructed of kiln-dried pine, with pine interior stops and mull casings on muller units, water repellent, preservative treated in accordance with WDMA I.S. 4-07'A. Ultra assembled frames have factory installed heavy vinyl nailing fins at head, side jambs, and sill. Nailing fin at head has integral drip cap. Transom head drip cap to be field applied to frame. Units with brickmould or casing do not have a vinyl nailing fin factory applied as standard.
 1. Jamb Thickness: 3/4 inch (19mm) at the side jambs and head.
 2. Standard overall jamb with extensions applied: 4-9/16 inch (116mm).
 3. Sill thickness: 1-3/16 inch (30mm) with 14° slope.
 4. Exterior: All frame parts are .050 inch (1.3mm) thick 6063 extruded aluminum alloy with accessory grooves, press fit onto the wood frame.
 5. Corner Construction: Head and side jambs have mitered corners and use internal corner keys with sealer. Sill end has a profile cut and utilizes an end key with sealer.
- B. Sash: Constructed of kiln dried pine, water repellent, preservative treated in accordance with WDMA I.S. 4-07'A.
 1. Thickness: 1-3/8 inch (35mm) [1-23/32 inch (44mm) Transom].
 2. Exterior: Sash parts are completely covered by a .019 inch (0.5mm) thick 5052 roll formed aluminum alloy with all corners lap jointed and sealed.
 3. Corner Construction: Mortise-and-tenon.
 4. Other wood species available:
 5. Interior glazed.
 6. Sash Lift Handles: Manufacturer’s “Curved Sash Lift Handles”; two (2) per sash. Color shall be as selected by Architect from full range of colors.
- C. Surface Finish:
 1. Exterior Finish – Aluminum
 2. Standard Paint Colors: Exterior aluminum frame and sash components, and PDL bars are to have a 70% fluoropolymer based coating in compliance with AAMA 2605-13 specifications. Color is to be as selected by Architect from full range of colors available.
 3. Interior Finish - Wood:
 - a. Interior wood is to have a water based stain with a clear water based top coat. Stain color is to be as selected by Architect from full range of colors available.
- D. Hardware:

1. Lock and keeper: Pick resistant Entry-Gard® cam locks with concealed locking mechanism including alignment lugs. Sash lock and keeper constructed of high-pressure die-cast zinc with aluminum back plate. Finishes: As selected by Architect from full range of options available. of colors available.
 2. Balancing system: Spring loaded block and tackle mechanical balancing system with polyester cord. Balance case is painted to match liner. Zinc die-cast pins engage and release balance clutches allowing the sash to be tilted in and removed for cleaning.
- E. Weatherstripping:
1. Frame Head Parting Stop: Rigid weatherable PVC parting stop with flexible fins. Beige.
 2. Top Rail, Check Rail, and Bottom Rail: Black TPE compression bulb.
 3. Sill: Rigid weatherable, UV resistant PVC water seal/weatherstrip. Passes drop dart test. Color as selected by Architect.
 4. Head Pad: Polyurethane and polyethylene foam pad.
 5. Jambliners: Made of weatherable, UV resistant PVC. Passes drop dart test. Color as selected by Architect.
 6. Transom Frame Nosing: Full perimeter 7/8 inch (22mm) closed cell foam backer rod.
- F. Screens: Sent loose as standard on all units.
1. Surrounds: Full
 2. Screen cloth: Basis of Design Manufacturer's BetterVue® Black fiberglass; color as selected by Architect.
 3. Screen Channels: .024 inch (0.6mm) thick roll formed aluminum.
 4. Attachment: Spring loaded plungers.
 5. Corner Construction and Finish Color: Screen channel colors to match exterior colors. Channels are joined and reinforced with a corner key. Screens are available for segment head and 1/2 circle top units.
- G. Performance Divided Lites (PDL): PDL system utilizes a permanently adhered wood grille bar to the interior and a permanently adhered aluminum grille bar to the exterior glass.
1. Material: Muntin is constructed of .050 inch (1mm) thick 6063 extruded aluminum alloy on exterior, pine on interior 5/8 inch (16mm) wide, beveled profile.
 2. Spacer bar between the glass. Finish as selected by Architect from full range of options.
 3. Exterior surface finish: To match frame and sash exterior.
- H. Accessories & Trim
1. Casings
 - a. 3-1/2 inch (89mm) profiled brickmould.
 2. Nosings
 - a. 2-1/8 inch (54mm) projected sill nosing with end caps.
 3. Frame Expanders
 - a. To suit conditions.

2.03 GLAZING

- A. Type 1: Double Pane. Basis of Design manufacturer's LoE insulating glass, with a stainless steel spacer bar, 20-year warranty; 9/16 inch (14mm) thick with LoE²-270, argon filled.
- B. Type 2: Double Pane. Manufacturer's LoE insulating Safety glass; 9/16 inch (14 mm) thick with a stainless steel spacer bar, option on surface 2 and a hard coat on surface 4 plus permanent coating (interior pane).
 - 1. Glazing shall comply with the test criteria for Category Classification II per CPSC 16 CFR Part 1201.
 - 2. Provide etched labels.
 - 3. Patterned, bronze, or gray-lite.
 - 4. Protective film.
- B. Glazing Methods:
 - 1. High Performance option operating units and fixed units have silicone-glazed structural silicone bedding sealant on #1 surface with a 0.5 inch (13mm) bite, and supplemental siliconized latex sealant on #4 surface at bottom wood glazing bead.
- C. Glass Options:
 - 3. Manufacturer's "ThermaPlus" LoE glass with LoE²-270 option on surface 2 and a LoE hard coat on surface 4 plus permanent coating (interior pane)].
 - 4. Patterned, bronze, or gray-lite.
 - 5. Safety glass available for Type 2 glazing.
 - 6. Protective film.
- D. Glazing Bead Options:
 - 1. Beveled profile

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Before installation, verify that openings are plumb and square and of proper dimension. Report frame defects or unsuitable conditions to the General Contractor before proceeding.
- B. Acceptance: Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Isolate dissimilar metal surfaces in accordance with galvanic protection underlayment materials specified in Division 07 Section “Sheet Metal Flashing & Trim”.
- B. Install windows according to manufacturer’s installation instructions, reviewed shop drawings and in accordance with Division 01 Section – Execution.
- C. Install sealant and related flashing materials at perimeter of assembly in accordance with Division 7 Section - Joint Sealants.
- C. Install accessory items as required.

3.03 ADJUSTING AND CLEANING

- A. Adjust operable sash to work freely with hardware functioning properly. Re-adjust at completion of the project if directed.
- B. Remove visible labels.
- C. Leave windows in a job clean condition. Final cleaning of glass will be done in accordance with Section 01740 – Cleaning.

3.04 PROTECTION

- A. Cover windows, in accordance with Division 1 Section – Execution.
- B. Protect Installed Construction, during masonry repair work, muratic acid washing, or other work that might cause damage.

END OF SECTION

SECTION 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
- C. Related Sections:
 - 1. Division 08 Section “Hollow Metal Doors and Frames”.
 - 2. Division 08 Section “Wood Door Restoration” for hardware associated with existing doors to be restored.
 - 3. Division 08 Section “Aluminum Framed Entrances” for hardware associated with aluminum entrances.
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate

the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- D. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- E. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.4 QUALITY ASSURANCE

- A. **Manufacturers Qualifications:** Engage qualified manufacturers with documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. **Installer Qualifications:** Installers, trained by the primary product manufacturers, with experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. **Door Hardware Supplier Qualifications:** Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
 - 1. **Scheduling Responsibility:** Preparation of door hardware and keying schedules.
- D. **Source Limitations:** Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.
- E. **Regulatory Requirements:** Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following.
 - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
 - a. **Handles, Pulls, Latches, Locks, and other Operating Devices:** Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. **Door Closers:** Comply with the following maximum opening-force requirements indicated:
 - 1. **Interior Hinged Doors:** 5 lbf applied perpendicular to door.
 - c. **Thresholds:** Not more than 1/2 inch high. Bevel both sides of raised thresholds with a slope of not more than 1:2.
- F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.

- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware for wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Review and finalize construction schedule and verify availability of materials.
 - 3. Review the required inspecting, testing, commissioning, and demonstration procedures

- I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site.

- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package

- C. Deliver, as applicable, permanent keys, cylinders, cores, and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements..

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Seven years for heavy duty mortise locks and latches.
 - 2. Five years for exit hardware.
 - 3. Twenty five years for manual surface door closers.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

- B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 – PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
 - 1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
 - B. Substitutions: Requests for substitution and product approval for mechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required
 - a. Widths up to 3'0": 4-1/2", heavy weight.
 - b. Sizes from 3'1" to 4'0": 5", heavy weight.
 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges.
 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 1. Out-swinging exterior doors.
 2. Out-swinging lockable doors.
 5. Acceptable Manufacturers:
 1. Bommer Industries (BO).
 2. Hager Companies (HA).
 3. McKinney Products (MK).
 4. Or approved equal.

2.3 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
1. Acceptable Manufacturers:

- a. Corbin Russwin; no substitutions, interchangeable cores that are compatible with the client's State-wide system.
- C. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Rim Type: Cylinders with tailpieces to suit locks.
 - 3. Keyway: Per facility request.
- D. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner. Incorporate decisions made in keying conference, and as follows:
 - 1. Existing System: Master key or grand master key locks to Owner's system.
 - 2. Keyed Alike: Key all cylinders to same change key.
- E. Key Quantity: Provide the following minimum number of keys:
 - 1. Per Owner's requirements.
- F. Construction Keying: Provide construction master keyed cylinders or temporary keyed construction cores where specified. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Furnish permanent cores for installation as directed under specified "Keying Conference".
- G. Key Registration List: Provide keying transcript list to Owner's representative in the proper format for importing into key control software.

2.4 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Exit Device at Hollow Metal Doors: Mortise Exit Device, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified lockset furnished in the functions as specified in the Hardware Sets. Lock chassis fabricated of heavy gauge steel, zinc dichromate plated, with through-bolted application, wrought brass, bronze or stainless steel armored front. Furnish with solid cast levers, standard 2 3/4" backset, 5/8" throw brass or stainless steel latchbolt. Locks are to be non-handed and fully field reversible. Coordinate with access control electric strikes.
 - 1. Basis of Design: Von Duprin 98 Series Fire Rated Mortise Exit Device with Heavy Protection; interchangeable cores that are compatible with the client's State-wide system, UL-Listed. Subject to compliance with requirements, products by one of the following will be considered for substitution:
 - a. Corbin Russwin
 - b. Dorma
 - c. Adams Rite
 - d. Or approved equal.

2. Lock Trim Design: Lever (where specified); style as selected by Architect.
- C. Exit Door Alarm: Basis of Design is Von Duprin “ALK Alarm Kit”; 85 decibel, mortise cylinder control, 9-volt battery, color as selected by Architect. Comparable products that meet or exceed the specifications will be considered, including the following:
1. Corbin Russwin
 2. Sargent
 3. Schlage
 4. Or approved equal.
- D. Exit Device at Wood Door to be Restored: Basis of Design: Von Duprin “9827/9927 Surface Vertical Rod Exit Device”, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified lockset furnished in the functions as specified in the Hardware Sets. Lock chassis fabricated of heavy gauge steel, zinc dichromate plated, with through-bolted application, wrought brass, bronze or stainless steel armored front. Furnish with solid cast levers, standard 2 3/4” backset, 5/8” throw brass or stainless steel latchbolt. Locks are to be non-handed and fully field reversible.
1. Basis of Design: Von Duprin “9827/9927 Vertical Rod Exit Device”. Subject to compliance with requirements, products by one of the following will be considered for substitution:
 - a. Corbin Russwin
 - b. Dorma
 - c. Adams Rite
 - d. Or approved equal.
 2. Lock Trim Design: Lever (where specified) ; style as selected by Architect.

2.5 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated.

2.6 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use.

Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.
 - b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.
 - c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
 - d. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics. Provide drop plates or other accessories as required for proper mounting.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.

B. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA 156.4, Grade 1 certified surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Unitrol arms to have door stop mechanism to absorb dead stop shock on arm and top hinge. Hold-open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width.

1. Acceptable Manufacturers

- 1) Corbin Russwin Hardware (RU) - Unitrol DC8000 Series.
- 2) Norton Door Controls (NO) - Unitrol 7500 Series.
- 3) Yale Locks and Hardware (YA) - Unitrol 4400 Series.
- 4) Or approved equal.

2.7 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Metal Protection Plates: ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following:

- a. Stainless Steel: 300 series, .050-inch thick, with countersunk screw holes (CSK).
- 4. Fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets.
- 5. Metal Door Edging: Door protection edging fabricated from a minimum .050-inch thick metal sheet, formed into an angle or "U" cap shapes, surface or mortised mounted onto edge of door. Provide appropriate leg overlap to account for protection plates as required. Height to be as specified in the Hardware Sets.
- 6. Acceptable Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).
 - d. Or approved equal.

2.8 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
 - 1. Basis of Design Saddles: Pemko 273x3AFG Thermal Barrier Saddle; 1/2-inch maximum height with beveled edges that have a 1:2 maximum slope on both sides, or approved equal. Comparable products from the below manufacturers that meet or exceed the requirements of the Basis of Design will be considered:
 - 1. Reese (RE)
 - 2. Zero (ZO).
 - 3. Or approved equal.
 - 2. Basis of Design Weatherstripping: Pemko S44 or approved equal. Comparable products from the below manufacturers that meet or exceed the requirements of the Basis of Design will be considered:
 - 1. Reese (RE)
 - 2. Zero (ZO)
 - 3. Or approved equal.

2.9 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.10 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Door Frames: Comply with ANSI/DHI A115 series.

3.3 INSTALLATION

- A. Install each item of mechanical hardware to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Door Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: If determined to be required because of operational problems with hardware, the hardware supplier or manufacturer's representative shall provide field inspections of installation. Supplier to prepare a written report to confirm that work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain door hardware.

3.8 DOOR HARDWARE SCHEDULE

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule.

Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

HW-1; Door No. 1:

Butts: Restore existing.

Exit Device: Surface Vertical Rod x Cylinder x Coordinator x Entrance x Lever x Bronze

Closer: Handicapped Accessible Type.

Saddle: Handicapped type.

Weatherstripping.

HW-4; Door Nos. 4 and 11:

Butts x 32D

Exit Device: Rim Type x Storeroom x Cylinder x Lever.

Exit Door Alarm x Cylinder

Closer: Handicapped Accessible Type.

Saddle: Handicapped Type.

Weatherstripping.

Armor plates x 32D

HW-5; Door Nos. 5,6,7,8,9,10:

Butts x 32D

Exit Device: Rim Type x Classroom x Cylinder x No operating Trim at Exterior.

Exit Door Alarm x Cylinder

Closer: Handicapped Accessible Type.

Saddle: Handicapped Type.

Weatherstripping.

Armor plates x 32D

END OF SECTION 087100

SECTION 089119 - FIXED LOUVERS

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. Fixed drainable sight proof aluminum louvers.

1.3 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
 - 1. Show weep paths, gaskets, flashings, sealants, and other means of preventing water intrusion.
 - 2. Show mullion profiles and locations.
- C. Samples: For each type of metal finish required.
- D. Delegated-Design Submittal: For louvers indicated to comply with structural performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.
- B. Sample Warranties: For manufacturer's special warranties.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.2/D1.2M.
 - 2. AWS D1.3/D1.3M.
 - 3. AWS D1.6/D1.6M.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 WARRANTY

- A. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.
 - 1. Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain fixed louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

2.2 PERFORMANCE REQUIREMENTS

- A. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length

and width according to AMCA 511 and AMCA Certified Ratings Seal for air performance and water penetration ratings.

- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

2.3 FIXED EXTRUDED-ALUMINUM LOUVERS

- A. Drainable Sightproof Architectural Line Louver: Basis of Design is Construction Specialties Model B5157 or approved equal. Products that meet the Basis of design including the following may be submitted for approval:
 - 1. Airolite
 - 2. Carnes
 - 3. Ruskin
 - 4. Or approved equal
- B. Physical Features:
 - 1. Louver Depth: 5 inches (100 mm).
 - 2. Extrusion Thickness:
 - a. Heads, Sills, Jambs, and Mullions: Not less than 0.081 inch (2.06 mm) for blades and 0.080 inch (2.03 mm).
 - b. Fixed Blades: Not less than 0.060 inch (1.52 mm).
 - 3. Louver Performance Ratings:
 - a. Free Area: Not less than 52.6%.
 - b. Structural Design: Structural supports shall be designed and furnished by the louver manufacturer to carry a wind speed of not less than 100 MPH.
 - 4. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
 - 1. Screen Location for Fixed Louvers: Interior face.
 - 2. Screening Type: 5/8-inch flattened expanded mesh, aluminum bird screen with a 0.055-inch (1.4 mm) thick extruded aluminum frame.
- B. Secure screen frames to louver frames with stainless-steel machine screws with heads finished to match louver, spaced a maximum of 6 inches (150 mm) from each corner and at 12 inches (300 mm) o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Reinforce extruded-aluminum screen frames at corners with clips.
2. Finish: Same finish as louver frames to which louver screens are attached.
3. Type: Rewirable frames with a driven spline or insert.

2.5 BLANK-OFF PANELS

A. Insulated Blank-Off Panels: Laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver.

1. Thickness: 2 inches (50 mm).
2. Metal Facing Sheets: Aluminum sheet, not less than 0.032-inch (0.81-mm) nominal thickness.
3. Insulating Core: Rigid, glass-fiber-board insulation.
4. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard extruded-aluminum-channel frames, not less than 0.080-inch (2.03-mm) nominal thickness, with corners mitered and with same finish as panels.
5. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.
6. Panel Finish: Same finish applied to louvers.
7. Attach blank-off panels with sheet metal screws.

2.6 MATERIALS

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T5, T-52, or T6.

B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
2. For color-finished louvers, use fasteners with heads that match color of louvers.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.7 FABRICATION

A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.

1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern.

- C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
 - 1. Frame Type: Exterior flange unless otherwise indicated.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide subsills made of same material as louvers.
- G. Join frame members to each other and to fixed louver blades with fillet welds concealed from view unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.8 ALUMINUM FINISHES

- A. Finish louvers after assembly.
- B. High-Performance Organic Finish: Two-coat Powder Coat, 1.5 to 3 mil thick Fluoropolymer finish, with zero VOC's to be emitted into the facility of application. Finish to adhere to to a 4H Hardness rating.
- C. All finishing procedures shall be one continuous operation in the plant of the louver manufacturer, and the coating shall meet or exceed the requirements of AAMA specification 2605 "Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels."
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 089119

SECTION 099113 – EXTERIOR PAINTING

PART 1- GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION REQUIREMENTS

- A. Summary: Paint exposed disturbed and uncovered existing surfaces unless otherwise indicated.
 - 1. Do not paint prefinished items, items with an integral finish, operating parts, and labels unless otherwise indicated.
- C. Submittals:
 - 1. Product Data.
 - 2. Samples.
- D. MPI Standards:
 - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
 - 2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.
- E. Mockups: Full-coat finish Sample of each type of coating, color, and substrate, applied where directed.
- F. Extra Materials: Deliver to Owner 1 gal. of each color and type of finish coat paint used on Project, in containers, properly labeled and sealed.

PART 2 - PRODUCTS

2.1 PAINT

- A. Manufacturers:
 - 1. Finnaren & Haley, MAB, Sherwin Williams or approved equal.
- B. Material Compatibility: Provide materials that are compatible with one another and with substrates.

1. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Colors: As selected by the Owner from the manufacturer's full range of colors. Color to match existing adjacent trim/soffit.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove hardware and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.
- B. Clean and prepare surfaces in an area before beginning painting in that area. Schedule painting so cleaning operations will not damage newly painted surfaces.
- C. Remove all paint down to bare metal and prime as noted.

3.2 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
 1. Use brushes only for exterior painting and where the use of other applicators is not practical.
- B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
 1. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

3.3 EXTERIOR PAINT APPLICATION SCHEDULE

- A. Existing and New Metal Surfaces:
 1. Alkyd primer: One coat
 2. Latex enamel: Two coats over alkyd primer.
- B. Wood Doors, Frame and Trim (natural) – Interior and Exterior Surfaces:
 1. Stain: Two (2) coats) to match color selected by Architect.
 2. Sealer: Two (2) coats Clear Satin Spar Varnish

END OF SECTION 099113