

Invitation to Bid
for
Roof Replacement, Repair, and Renovation
John Silber Early Learning Center (ELC)

For the City of Chelsea, MA

Contract # 2017-11

June 2016

IFB Contact:

City of Chelsea, MA
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MANDATORY SUBMITTALS:

RESPONDER INFORMATION FORM (To be first page of Proposal)
PRICE PROPOSAL FORM
CERTIFICATE OF NON-COLLUSION
STATEMENT OF CORPORATE AUTHORITY
WAGE THEFT CERTIFICATION
REFERENCE FORM
OSHA COMPLIANCE CERTIFICATION

IFB ATTACHMENTS:

SAMPLE CITY OF CHELSEA CONTRACT FOR
SERVICES OVER \$10,000

MASSACHUSETTS PREVAILING WAGE RATES

DRAWINGS

**CITY OF CHELSEA
MASSACHUSETTS
NOTICE TO BIDDERS**

**ROOF REPLACEMENT, REPAIR, AND RENOVATION
JOHN SILBER EARLY LEARNING CENTER (ELC) A.K.A.
SHURTLEFF SCHOOL, 99 HAWTHORNE ST
CHELSEA, MASSACHUSETTS**

The City of Chelsea, Chelsea, Massachusetts invites sealed proposals from Contractors to replace (selective), repair and renovate the roof of John Silber Early Learning Center, Chelsea, MA. The work consists of, but is not limited to, removing and replacing select areas of roof, repairing the entirety of the roof, and selectively renovating the roof.

The estimated cost of the work is \$ 450,000.

Plans, specifications and other Contract Documents may be obtained at the Purchasing Office, City of Chelsea, City Hall, Room 206, 500 Broadway, Chelsea, MA, **after 11:00 AM., E.D.T., June 30, 2016.** Copies of the documents for the project may be obtained by email for the purposes of bidding from the City of Chelsea.

Sealed general bids for this project will be accepted from eligible bidders at the City of Chelsea, Purchasing Office, **ATTN:** Chief Procurement Officer, City Hall – Room 206, 500 Broadway, Chelsea, MA 02150 until **11:00 AM, E.D.T July 14, 2016** at which place and time they shall be publicly opened, read aloud and recorded for presentation by the Awarding Authority.

A pre-bid conference will be held for all interested parties on-site at the Shurtleff School, 99 Hawthorne St, Chelsea, MA on **July 6, 2016 at 10:00 AM, E.D.T.** Attendance at this pre-bid conference is strongly recommended for parties submitting a bid.

Each bid shall be accompanied by a bid deposit in the form of a bid bond, or cash, or a certified check on, or a treasurers or cashier's check issued by a responsible bank or trust company, payable to the City of Chelsea in the amount of five percent (**5%**) of value of the bid. Bid deposits will be dealt with as provided in Massachusetts General Laws, Chapter 149, Section 44B.

To be given consideration, all general bids must be accompanied by a copy of the Bidder's Certificate of Eligibility (DCAM&M Form) and an Update Statement (DCAM&M Form).

The certification category of work is: Roofing and Flashing.

Bids shall be made on the basis of the Minimum Wage Rates as determined by the Commissioner of Labor and Industries, Pursuant to the Provisions of Chapter 149, Sections 26 to 2W inclusive of Massachusetts General Laws, a copy of which is attached to and is made a part of the Contract.

Bidders' selection procedures and contract award shall be in conformity with applicable statutes of the Commonwealth of Massachusetts.

Performance, and Labor and Materials Payment Bonds in the full amount of the contract price will be required from the successful bidder.

The Awarding Authority reserves the right to reject any or all general bids, if it be in the public interest to do so, and to reject any sub-bid on any sub-trade if it determines that such sub-bid does not represent the sub-bid of a person competent to perform the work as specified or that less than three such sub-bids were received and that the prices are not reasonable for acceptance without further competition.

City of Chelsea

Dylan Cook
Chief Procurement Officer

Section 1 PROCUREMENT SCOPE

1.1 Authority

Invitation to Bid Procedures and award of the Contract shall be in accordance with Massachusetts General Law, Chapter 149, plus all applicable Federal, State and Local laws and regulations.

1.2 Withdraw, Modify, And Amend Bids

Bidders who wish to withdraw, modify or amend their bid must do so in writing utilizing electronic mail to the City of Chelsea Chief Procurement Officer at dcook@chelseama.gov or via fax at 617-466-4225, no later than the time and date set forth herein for the receipt of the Bid for **Roof Replacement, Repair, and Renovation John Silber Early Learning Center (ELC)**. All such withdrawals, modifications or amendments must so state in the subject line of the email correspondence. Any withdrawal, modification or amendment arriving after the date and time set forth for accepting bids will not be considered. After the opening of the bids, a bidder may not change any provision of the bid in a manner prejudicial to the interests of the City of Chelsea or fair competition. Minor informalities will be waived at the discretion of the City of Chelsea.

1.3 Bid Bond

Each bid must be accompanied by a certified check: of the bidder or a bid bond duly executed by the bidder as principal and having as surety thereon a surety company approved by the City, in the amount of 5% of the bid, payable to the "City of Chelsea" and must be filed with the original bid.

1.4 Payment & Performance Bonds

The successful bidder is required to furnish performance bonds and payment bonds in the contract amount and with surety satisfaction to the City, in an award form this Invitation for Bids. The Bidder must pay all costs. The Performance Bond shall be in the sum of **100%** of the contract price. The Payment Bond shall be in the sum of **100%** of the contract price. The bonds shall be provided by the successful bidder to the City within five business days of the contract award.

1.5 Familiarity With Requirements

Bidders are to thoroughly familiarize themselves with the requirements of this Invitation for Bids. Ignorance of the requirements will not relieve the bidder from any obligations or liabilities of any contract(s) issued as a result of this Invitation for Bids.

1.6 Independent Party

Under this Invitation for Bids, the successful bidder declares itself to be at all times acting and performing as an independent party and nothing in this request for bid or any subsequent contract(s) is intended to constitute a partnership or joint venture between the bidder and the City of Chelsea.

1.7 Conflict of Interest

No officer or employee of the City of Chelsea shall participate in any decision relating to any contract which would affect their financial or personal interest or the interest of any corporation, partnership, sole proprietorship or association in which they are directly or indirectly interested.

1.8 Political Activity Prohibited

None of the services to be provided by any bidder shall be used for any partisan political activity or to further the election of any candidate for public office.

1.9 Assignment by Contractor

The successful bidder or contractor shall not assign in whole or in part or otherwise transfer any interest in any contract without the written consent of the City of Chelsea, provided however, that the present and prospective claims for money due owing to the Contractor from the City of Chelsea or any other Buyer may be assigned to a bank or trust company or to a financial institution insured by the Federal Deposit Insurance Corporation (FDIC) without such consent so long as notice of such assignment is promptly furnished to the City of Chelsea. Any complete or partial assignment of the contractor's or successful bidder's interest in any such contract shall require the assignee, at the City of Chelsea's discretion, to supply such further information as the City of Chelsea deems necessary to comply with the City of Chelsea rules and regulations governing contracts for services. Any such assignment, in whole or in part, shall also be expressly made subject to all defenses, set-offs or counter claims which would have been made available to the City of Chelsea against the successful bidder in the absence of such assignment.

1.10 Subcontracting

None of the services to be provided by the contractor pursuant to any contract shall be subcontracted or delegated in whole or in part to any other organization, association, individual, corporation, partnership, or any other such entity without the prior written approval of the City of Chelsea. All intended subcontracts must be in writing. All intended subcontracts shall be provisions, which are functionally identical to and consistent with the language of this Invitation for Bids.

1.11 Choice of Law

Any contracts awarded as a result of this Invitation for Bids shall be construed under the laws of the Commonwealth of Massachusetts. The successful bidder and agents thereof agree to bring any federal or state legal proceedings arising from any such contract in which the City of Chelsea is a party in a court of competent jurisdiction within the Commonwealth of Massachusetts. This section shall not be construed to limit any rights any party may have to intervene in any action in any court or wherever pending in which the other is a party.

1.12 Notices

Unless otherwise specified, any notice hereunder shall be in writing and shall be deemed delivered when sent via electronic mail (e-mail), given in person to either party or deposited in the U.S. Mail, postage prepaid and addressed to the persons indicated in any contract or as specified by any amendment hereto.

1.13 Severable Sections Do Not Affect Entire Contract

If any provision of the Invitation for Bids or any subsequent contract is declared or found to be illegal, unenforceable or void, then both parties shall be relieved of all obligations under the provision. The remainder of the Invitation for Bids and any subsequent contract shall remain in full force and effect and enforceable to the fullest extent provided by law.

1.14 Liquidated Damages for Failure to Enter Into Contract

The successful Responder, upon its failure or refusal to execute and deliver the Contract, Bond and Certificates of Insurance required within ten days after receipt of notice of the acceptance of the bid, shall forfeit to the City of Chelsea, as liquidated damages for such failure or refusal, the security deposited with its bid, provided that the amount forfeited shall not exceed the difference between its bid price and the bid price of the next lowest responsive and responsible Responder. In case of death, disability, bona fide clerical or mechanical error of a substantial nature or similar unforeseen circumstances affecting the Responder, its bid deposit shall be returned.

1.15 Liquidated Damages for Failure to Perform Under Terms of the Contract

Should the successful Responder fail to commence or diligently perform according to the terms of the contract, the successful Responder agrees to pay to the City of Chelsea, as liquidated damages, Two Hundred Fifty Dollars (\$250.00) per calendar day that the successful Responder fails to commence or diligently perform the work in accordance with the contract documents and/or is in violation of the contract. Liquidated damages assessed under this provision shall be deducted from any payment(s) due to the successful Responder.

1.16 Contract Performance

The failure of any party to insist in any one or more situations, upon performance of any of the terms or provisions of any part of this Invitation for Bids or resulting contract shall not be considered as a waiver or relinquishment of the right of either party to future performance of any such term or provision, and the rights and obligations of the parties to such future performance shall continue in full force and effect.

1.17 Prevailing/Minimum Wages

Prevailing/Minimum Wage Rates as determined by the Commissioner of the Division of Occupational Safety of the Executive Office of Labor and Workforce Development under the provisions of Massachusetts General Laws Chapter 149, Section 26 to 27D, as amended, apply to this project. It is the responsibility of the Bidder, before the bid opening, to request, if necessary, any additional information on Prevailing/Minimum Wage Rates for those trades' people who may be employed for the proposed work under this contract.

1.18 Funding & Fiscal Year Appropriation

Appropriations for expenditures by the City of Chelsea and authorizations to spend for a particular purpose are ordinarily made on a fiscal year basis. The fiscal year for the City of Chelsea, MA begins on July 1st and ends June 30th of the following year. The obligations of the City of Chelsea under any contract resulting from this Invitation for Bids for any subsequent fiscal year following the fiscal year in which the initial contract is awarded is subject to the appropriations to the City of Chelsea of funds sufficient to discharge its obligations, which accrue in such subsequent fiscal year, and to the authorization to spend such funds for the purposes of this Invitation for Bids. In the absence of such appropriation or authorization, any contract resulting from this Invitation for Bids shall be terminated immediately without liability for damages, penalties or other charges arising from early termination. Expenditures for contracted services, which will extend beyond a single fiscal year shall not exceed in any fiscal year the amount appropriated and authorized for the said fiscal year.

1.19 Procurement Calendar

The City of Chelsea invites bids that will result in a contract. The IFB schedule of events for this solicitation, subject to amendment by the City of Chelsea is:

EVENT	DATE
IFB Released	6/30/2016
<u>Optional Pre-Bid Conference (99 Hawthorne St)</u>	7/6/2016 at 10:00AM
Deadline for Written Inquiries	7/8/2016
Response to Written Inquiries	7/11/2016
Due Date for Responses	7/14/2016 at 11:00AM

1.20 Duration of Contract

The contract term will commence upon signature of agreement and end no later than October 31, 2016.

End of Section

Section 2 General Bid Information

2.1 Required IFB Sections

The Responder must provide, in its bid, a reply to the particular specifications included in the Invitation for Bids.

2.2 Minority or Woman Business Enterprise Participation

In accordance with the Minority Business Enterprise Plan for the City of Chelsea, all qualified Minority-Owned Business Enterprises (MBE) or Woman-Owned Business Enterprises (WBE) are strongly encouraged to submit bids in response to this Invitation for Bids. For the purpose of this IFB, the term MBE or WBE shall mean a vendor who is certified as a minority business enterprise by the State Office of Minority and Women-Owned Business Assistance (SOMWBA), and who is certified at the time the vendor's bid is submitted.

All minority owned businesses are encouraged to apply for SOMWBA certification. For further information on SOMWBA qualifications or access to SOMWBA vendor lists, contact the Supplier Diversity Office, Commonwealth of Massachusetts Operational Services Division at 617-720-3300.

2.3 The Contract Award

Based upon the bids received, the contract will be awarded to the lowest responsible and eligible Bidder.

2.4 ADA, Regulatory, Compliance and Standards

Responders are expected to provide services and commodities that are in compliance with Section 504 of the Federal Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, the Telecommunications Act of 1996, and all successor federal and related legislation throughout the term of any contract resulting from this solicitation.

2.5 Indemnification

Any successor in exchange for entering into an agreement or contract resulting from this Invitation for Bids shall indemnify and hold harmless the City of Chelsea and all persons acting for or on behalf of either of them from all suits and claims against them, or either of them, arising from or occasioned by the use of any service, material, equipment or apparatus, or any part thereof, which infringes or is alleged to infringe on any patent rights. In case such service, material, equipment or apparatus, or any part thereof in any suit is held to constitute infringement, the successful Responder, within a reasonable time, will at its expense, and as the City of Chelsea may elect, replace such material, equipment or apparatus with non-infringing material, equipment or apparatus or remove

the material, equipment or apparatus and refund the amounts paid therefore. Said indemnification includes reasonable attorney's fees related thereto.

Furthermore, any successful Responder in exchange for entering into any agreement or contract resulting from this Invitation for Bids agrees to indemnify and hold harmless, release and forever discharge the City of Chelsea as well as their officers, agents and employees as well as their successors and assigns from any and all manner of actions, suits, claims, demands, judgments, damages and liability in law and in equity which may arise or result from performance under this contract. This includes any discrimination, labor or employment claims against the successful Responder and the City of Chelsea and any and all manners of legal action brought against the successful Responder and /or the City of Chelsea. Said indemnification includes reasonable attorney's fees related thereto.

2.6 Federal, State and Local Laws

The successful Responder will comply with all applicable Federal, State and Local laws and regulations.

2.7 Tax Exempt

Purchases made by municipalities and government are exempt from Federal Excise Taxes and Massachusetts Sales Taxes and bid prices must show the exclusion of such taxes. Tax exemption certificates will be furnished as required.

2.8 Insurance

The successful Responder in addition to any insurance required by State or Local Law, shall maintain in force during the term of any contract(s) issued as a result of this Invitation for Bids, the following insurance issued by an insurance company licensed to do business in the Commonwealth of Massachusetts. Failure to provide or maintain such insurance shall be grounds to reject a bid or execute a contract.

- a. Public Commercial Liability coverage in the amount of \$1,000,000.00 per occurrence and \$2,000,000.00 aggregate. Automobile Liability Insurance coverage in the amount of \$500,000.00 per person, \$1,000,000.00 per occurrence. Property damage Insurance in the amount of \$250,000.00.
- b. Worker's Compensation Insurance in the amounts required by Massachusetts Law.
- c. Evidence of such insurance must name the City of Chelsea as the named insured as well as the successful Responder.
- d. An Insurance Certificate giving evidence of the insurance must be delivered to the City of Chelsea within 10 days by the successful Responder receiving the award of this Invitation for Bids.

2.9 Confidentiality

The successful Responder will comply with all provisions of Executive Order No. 11246 of September 24, 1975 and the successful Responder acknowledges that in performance of any contract resulting from the Invitation for Bids it may require or have access to “personal data” and become a “holder” of personal data as defined by M.G. L. c. 66A. The successful Responder shall comply with all laws and regulations relating to confidentiality and privacy, including but not limited to any rules and regulations of the City of Chelsea. The successful Responder shall at all times recognize the City of Chelsea’s ownership of personal data and the exclusive right and jurisdiction of the City, and “data subjects” (as defined in chapter 66A) to control the use of personal data. The successful Responder shall immediately notify the City of Chelsea both orally and in writing if any personal data in its possession is subpoenaed, improperly used, copied or removed by anyone except an authorized representative of the City of Chelsea. The successful Responder shall cooperate with the City of Chelsea in taking all steps it deems advisable to enjoin, misuse, regain possession and/or otherwise protect the City of Chelsea’s rights and data subject’s privacy. The successful Responder shall allow access to any personal data held in their possession solely to those employees of the City of Chelsea who require such information in the performance of their occupational responsibilities. All personal data held by the successful Responder shall be delivered to the City of Chelsea within 14 calendar days after termination of any contract resulting from this Invitation for Bids. The successful Responder agrees to take reasonable steps to insure the physical security of such data under its control, including but not limited to fire protection, protection against smoke and water damage, alarm system, locked removal of manually held data, passwords, access logs, badges or other methods reasonably expected to prevent loss or unauthorized access to electronically or mechanically held data, limited terminal access, access to electronically or mechanically held data, limited terminal access, access to input documents and design provisions to limit use of personal data. The successful Responder agrees that it will inform each of its employees having any involvement with their personal data or confidentiality. The City of Chelsea shall have access at all times to any data maintained pursuant to any contract resulting from this Invitation for Bids, without the consent of the data subject. The successful Responder shall use personal data, and material derived from such data, only as necessary for the performance of the subject contract. Failure of the successful Responder to comply with the requirements of this section may be grounds for terminating any contract resulting from this Invitation for Bids.

2.10 Force Majeure

Neither the City of Chelsea nor the successful Responder shall be liable to the other, nor deemed to be in breach of any contract resulting from this Invitation for Bids for failure or delay in rendering performance rising out of causes factually beyond its control and without its fault or negligence. Such causes may include, but are not limited to, Acts of God or the public enemy, wars, fires, flood, epidemics, quarantine restrictions, strikes, unforeseen freight embargos or unusually severe weather. Dates of times of performance shall be extended to the extent of delays excused by this section, provided that the party

whose performance is affected notifies the other party promptly of the existence and nature of such a delay. It is agreed that since the performance dates of the subject contract are of the essence and important to the implementation of essential City of Chelsea work, continued failure to perform for periods aggregating 45 or more calendar days, even for causes beyond the control of the successful Responder, shall afford the City of Chelsea the right to terminate any contract resulting from this Invitation for Bids without assessment of termination costs or penalties.

2.11 Equal Opportunity

During the performance of this contract, the successful Responder agrees as follows:

- a. The successful Responder will not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin, sexual orientation, which shall not include persons whose sexual orientation involves minor children as the sex object, genetic information or ancestry. The successful Responder will take affirmative action to ensure that applicants are employed and that the employees are treated during employment without regard to their race, religion, color, sex, nation origin or sexual orientation, which shall not include persons whose sexual orientation involves minor children as the sex object, genetic information or ancestry.
- b. The successful Responder will comply with all provisions of Executive Order No. 11246 of September 24, 1975 and all of the rules, regulations and relevant orders of the Secretary of Labor.

2.12 Termination

The Responders for this Invitation for Bids should note that the City of Chelsea reserves the right to terminate any contract resulting from this Invitation for Bids in whole or in part, by written notice:

- **Without cause:** Either party may terminate the subject contract by giving written notice to the other party at least 60 calendar days prior to the normal contractual effective date of termination as stated or such other period as is mutually agreed upon in advance by the parties
- **For cause:** If, in the opinion of the City of Chelsea, the successful Responder fails to fulfill its obligations, the City of Chelsea may terminate any contract resulting from this Invitation for Bids by giving 30 days written notice to the successful Responder at any time. The subject contract shall be terminated immediately in the event of fraud or program abuse.
- **Emergency:** The City of Chelsea may terminate or suspend any contract resulting from this Invitation for Bids up to 60 calendar days by providing written notice to the successful Responder, stating the grounds for the City of Chelsea's action, in the form of U.S. Mail, hand-carried letter, or other appropriate written means, if the City of Chelsea determines that immediate action is necessary to protect City, State and/or Federal funds or property, or to protect persons from

injury. Such termination or suspension shall be effective upon receipt of notice of either suspension or termination by the successful Responder. In the case of a suspension under this paragraph, the notice of suspension shall be accompanied by instructions from the City of Chelsea specifying requisite actions by the successful Responder to remove the suspension, proposed timetable for meeting those requirements and a description by the City of Chelsea of allowable activities and costs, if any, during the suspension period. Failure by the successful Responder to remedy the stated deficiencies according to the timetable prescribed by the City of Chelsea shall be cause for immediate termination.

- **Elimination or Reduction of Funding:** In the event of a reduction of funding for any reason, the City of Chelsea may terminate any contract resulting from this Invitation for Bids by providing notice of termination in a reasonable time. The City of Chelsea may provide a conditional notice of termination with a proposed amendment to the subject contract. Any such notice shall provide that the subject contract will terminate automatically 30 calendar days after the date of the conditional notice of termination unless the successful Responder submits to the City of Chelsea a properly signed copy of the amendment, or such modification form of amendment as may be agreeable to the City of Chelsea, within 20 calendar days after the date of the conditional notice of termination, or such other time as it is otherwise specified in the conditional notice.
- **Office's Remedies:** Upon Termination for Cause or for Emergencies: Notwithstanding the terms contained in this section, in the event of termination, the successful Responder shall not be relieved of liability to the City of Chelsea by virtue of any breach of any contract resulting from this Invitation for Bids by the successful Responder. In the event of termination pursuant to this section, the City of Chelsea may withhold any payments to the successful Responder for the purpose of set-off until such time as the exact amount of damages due to the City of Chelsea from the successful Responder is determined. In addition to and notwithstanding the above, the successful Responder covenants and agrees that in the event of termination of any contract resulting from this Invitation for Bids the successful Responder shall pay to the City of Chelsea as damages: (a) such sum as, at the time of termination, the City of Chelsea reasonably determines that is, shall require to compensate a subsequent contractor to complete the delivery of service, and (b) the sum, reasonably determined by the City of Chelsea, which will compensate the City of Chelsea for all the direct and indirect costs resulting from delay in the delivery of services upon the successful Responder's default. The successful Responder further covenants and agrees with the City of Chelsea that the successful Responder shall pay all of the City of Chelsea's costs and expenses (including attorney's fees) incurred or paid in obtaining and enforcing any court order favorable to the City of Chelsea for any obligation of the successful Responder under any contract resulting from this Invitation for Bids.

2.13 Obligation in the Event of Termination

Upon termination of any contract resulting from this Invitation for Bids, all documents finished or unfinished, data, studies and reports prepared by the successful Responder pursuant to the subject contract shall become the property of the City of Chelsea. Copies of finished and unfinished documents, data, studies and reports generated as a necessary part of performing the subject contract shall be delivered to the City of Chelsea upon reasonable request and shall be retained by the successful Responder for future use. The City of Chelsea shall promptly pay the successful Responder for all services performed and for all costs and un-cancelable commitments reasonably incurred in performance of the subject contract to the effective date of termination, provided the successful Responder is not in default of the terms of the subject contract and submits to the City of Chelsea properly completed invoices with supporting documentation covering such services no later than 45 days after the effective date of termination, and that the successful Responder make every reasonable effort to minimize or recover costs incurred.

2.14 Ownership of Furnishings & Equipment

Unless otherwise provided by law or a federal grant award, title to all furnishings and equipment provided by the City of Chelsea or that the awarded Responder provides under the terms of this Invitation for Bids and paid for with public funds, shall vest in and be retained by the City of Chelsea. Upon completion of performance of the awarded Responder's contract, the awarded Responder shall return such furnishings and equipment in its possession in the same condition as at the commencement of any contract resulting from this Invitation for Bids, normal wear and tear excepted.

2.15 Anti-Boycott Warranty

During the term of any contract resulting from this Invitation for Bids, neither the successful Responder nor any "affiliated company" as hereafter described, shall participate in or cooperate with an international boycott, as defined in section 999(b) (3) and (4) of the Internal revenue Code of 1954, as amended by the Tax Reform Act of 1986, or engage on conduct declared to be unlawful by sections 2 and 4 of Chapter 151E of The Massachusetts General Laws. As used herein, an "affiliated company" shall be any business entity or which at least 51% of the ownership interests are directly or indirectly owned by the successful responder or by a person or persons or business entity or entities which directly own at least 51% of the ownership interest of the successful Responder.

2.16 Tied Bids

In the event that there is a tie bid between two (2) responsive and responsible bidders, the award of the contract will be determined by a coin toss. The bidder's whose submission was received earliest shall be assigned "Heads" in the coin toss. In the event that there is a tie bid with three (3) or more responsive and responsible bidders, the award shall be made by a draw by lot limited to those bidders. The coin toss/draw by lot shall be

scheduled within two (2) business days from when it was determined by the Town to be a tie bid. The bidders involved shall be given an opportunity to attend. The coin toss/drawing shall be witnessed by at least three (3) Town officials. The tie breaker event shall be held at Chelsea City Hall during regular business hours.

2.17 Unexpected Closures or Delays

If, at the time of the scheduled bid submission deadline, the designated location for delivery of the bid is closed due to uncontrolled events such as fire, snow, ice, wind, building evacuation or other, the deadline will be postponed until 11:00 a.m. on the next normal business day. Bids will be accepted at the same location until that date and time.

End of Section

Section 3 Responder's Bid Information

3.1 Bidder Communications

Responders are prohibited from communicating directly with any employee of the Purchasing Department and any other member of the City of Chelsea except as specified in this Invitation for Bids, and no other individual City of Chelsea employee or representative is authorized to provide any information or respond to any question or inquiry concerning this Invitation for Bids. Responders may contact the person identified on the cover sheet of this Invitation for Bids in the event this Invitation for Bids is incomplete.

3.2 Reasonable Accommodation

Responders with disabilities or hardships that seek reasonable accommodation, which may include the receipt of the Invitation for Bids information in an alternative format, must communicate such requests in writing, via electronic mail (e-mail) to the contact person. Requests for accommodation will be addressed on a case by case basis. A Responder requesting accommodation must submit a written statement, via e-mail which describes the responder's disability and the requested accommodation to the contact person for the Invitation for Bids. The City of Chelsea reserves the right to reject unreasonable request.

3.3 Public Records

All bids and information submitted in response to this Invitation for Bids are subject to the Massachusetts Public Record Law, M.G.L., Chapter 66, Section 10, and to Chapter 4, Section 2, and Subsection 26. Any statements in the Responder's bid inconsistent with these statutes will be disregarded.

3.4 Brand Name or Equal

Unless otherwise specified in this Invitation for Bids, any reference to a particular trademark, trade name, patent, design, type, specification, producer or supplier is not intended to restrict this Invitation for Bids to any manufacturer or proprietor or to constitute an endorsement of any good or service, and the City of Chelsea must consider clearly identified offers if substantially equivalent goods and services submitted in response to such reference.

3.5 Publicity

Any Responder awarded a contract under this Invitation for Bids is prohibited from selling or distributing any information collected or derived from the contract, including lists of participating or eligible departments, employee names, telephone numbers, e-mail

addresses, addresses or any other reports or information except as specifically authorized under this contract.

3.6 Costs

Costs for services that are not specifically identified in the Responder's response and identified as part of a contract, will not be compensated under any contract awarded pursuant to this Invitation for Bids.

The City of Chelsea will not be responsible for any costs or expenses incurred by responders responding to this Invitation for Bids.

3.7 Required Contract Attachments

All Responders are required to complete, sign and return at minimum the following documents:

- 1.) **Bid Information**- to be included as cover page of bid
- 2.) **Certificate of Non-Collusion**- Signature required
- 3.) **Statement of Corporate Authority (If Responder is a Corporation)** - If the Responder is a Corporation, a vote of the Corporation approving participation in this Invitation for Bids process must be signed by the corporate officers with the Corporate Seal Affixed and attached to the original Invitation for Bids.

If the Responder is a Corporation, the names and addresses of the corporate Officers and the state and date of incorporation must be included. The Responder must state if the Corporation is publicly held or privately held. If the Corporation is publicly held, the exchange on which it is traded and the symbol under which it is traded is required.

Sole Proprietorship (If Responder is a Sole Proprietorship)- If the Responder is a Sole Proprietorship, a partnership or any other legal business entity, the names and addresses of the officers must be included, the parent state of business and the numbers of years this entity has been in business. In short, a complete business profile must be included in the bid.

- 4.) **Bid Pricing Form** - Signature required
- 5.) **Reference Form**- To include three current contract references, at least one of which is a government agency that can be contacted during the IFB process. Two of the references must be customers for which the Responder is or has provided services similar to those outlined in the Scope of Services of the IFB. Include customer name, contact person, his/her title, address and telephone number.

Do not use the names of relatives or City Employees as references. Do not use any previous City contracts as a source of project reference information. You may use previous City contracts as a record of your experience only

- 6.) **OSHA Compliance Certification** - Signature required

3.8 Submitted Responses

The City of Chelsea shall be under no obligation to return any responses or materials submitted by the Responder in response to this Invitation for Bids. All materials submitted by Responders become the property of the City of Chelsea and will not be returned to the Responder. The City of Chelsea has the right to use any ideas, concepts or configurations that are presented in the Responder's bid whether or not the bid is selected for contract award.

3.9 Clarification of Response

The City of Chelsea is not required to seek clarification of responses; therefore, the responder should be as clear as possible in all of its responses to this Invitation for Bids.

3.10 Evaluation and Award of Contract

All pricing must remain constant for the entire term of the contract, as well as any possible extension offered. Bids will be evaluated and awarded based upon the lowest, responsible and eligible bid.

3.11 Rejection of Responder's Bid

A Responder's bid may be rejected by the City of Chelsea if the Responder's bid:

- Fails to adhere to one or more of the requirements
- Fails to submit its bid to the required address on or before the Invitation for Bid responses due date
- Fails to submit a bid in accordance to the format and instructions specified or to supply the minimum information requested in this Invitation for Bids.
- Fails to meet unconditionally or is unable to demonstrate competence to meet the requirements of this Invitation for Bids.
- Misrepresents its equipment, systems or services or provides demonstrably false information in its response or fails to provide material information.
- Violates the restrictions on contacts with the City of Chelsea employees and representatives
- Refuses, is unable to, or fails to provide clarification requested by the City of Chelsea in a reasonable time frame.

3.12 Invitation for Bids Cancellation

The City of Chelsea retains the right to cancel this Invitation for Bids, or any portion thereof, at any time prior to the execution and approval of a contract. If this Invitation for Bids is cancelled, all responses received to this Invitation for Bids will be rejected. All expenses related to the preparation of responses to this Invitation for Bids remain the responsibility of the Responder.

3.13 No Guarantee of Purchase

The City of Chelsea makes no guarantee that any purchase shall take place from any contract resulting from this Invitation for Bids nor does the City of Chelsea guarantee any minimum quantity of purchases from any contract resulting from this Invitation for Bids. Any estimated or past procurement volumes referenced in this Invitation for Bids are included only for the convenience of the Responders, and not to be relied upon as any indication of future purchases.

The Responder may not place, as a condition for providing the cost levels proposed, any minimum purchase requirements.

3.14 Prime Contractors and Subcontractors

Prior approval of the eligible entity is required for any subcontracted service of the contract. Contractors are responsible for the satisfactory performance and adequate oversight of its subcontractors. Subcontractors are required to meet the same state and federal financial program and reporting requirements and are held to the same reimbursable cost standards as the successful Responder.

The City of Chelsea requires a single point of contact for any contract resulting from this Invitation for Bids. Subcontractors may be used, but the successful Responder, as prime contractors, shall be responsible for meeting all of the terms of any contract resulting from this Invitation for Bids and must accept full responsibility for any subcontractor's performance.

Responders must provide a list of subcontractors, a description of each subcontractor's responsibility in regards to this contract and signed letters of agreement between the Responder as the prime contractor, and its subcontractor(s) identifying their responsibilities and their relationship to the prime contractor. The prime contractor must notify each individual account (eligible entity) in writing; the name of their subcontractor both initially and when a sub-contractor is changed. If a subcontractor has filed for Chapter 11 Bankruptcy or Chapter 7 Bankruptcy, the prime contractor also must notify the City of Chelsea. The notification must be written and must be within one week of the events noted above.

3.15 Written Inquiries

Responders may submit written inquiries concerning any part or attachment of this Invitation for Bids. Written inquiries regarding issues outside of the scope of this Invitation for Bids will not be considered.

All inquiries must be submitted by the required date and time, to the contact listed on the cover page of this Invitation for Bids.

All written inquiries must be submitted via electronic mail (email) only. No other manner of submission will be accepted.

Any change to this submission date and/or time will be made by a notice sent electronically to all Responders. The Responder is responsible for confirming receipt of written inquiries with Dylan Cook, Chief Procurement Officer, and City of Chelsea at dcook@chelseama.gov.

The City of Chelsea will provide written responses via electronic mail (e-mail) to all written inquiries received by the required due date. Responses will not identify the inquiry by Responder.

3.16 Instructions for Submission of IFB Responses

Each Invitation for Bid Response must be sealed, labeled and submitted to the address listed on the cover page of this document.

Paper Submission- the Responder must submit one (1) original response to the Invitation for Bids marked "ORIGINAL" The Envelope must be clearly marked "**Roof Replacement, Repair, and Renovation John Silber Early Learning Center (ELC)**".

3.17 Deadline for Submission

All responses to this Invitation for Bids are due at the address listed on the cover page and no later than the date and time listed in the Procurement Calendar.

End of Section

Section 4 Plans and Specs

SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. General provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
- B. The latest revision or version of codes and standards referenced within the Contract Specification Section shall be used.
- C. Contractor shall be advised that this bid document includes additional background information such as but not limited to: "ELC roof tar leak document August of 2014."

1.2 PROJECT INFORMATION

- A. Project Identification: Project consists of replacement of existing roof top cooling tower.
 - 1. Project Location: Shurtleff School, 99 Hawthorne Street, Chelsea Massachusetts, 02150.
 - 2. Owner: Chelsea Public Schools, 500 Broadway, Chelsea, MA 02150.
- B. Engineer Identification: The Contract Documents, dated June 2016, were prepared for the Project by Jacobs Project Management Company, 343 Congress Street, Boston, Massachusetts, 02210.
- C. Construction Manager: Construction Manager for this Project and shall be Project's Constructor. In Divisions 1 through 26 Specifications, the terms "Construction Manager" and "Contractor" are synonymous.
- D. Project Coordinator: Mr. Joseph Cooney, Director of Facilities Management, Chelsea Public Schools, or his appointee for the Project Coordinator.

- 1.3 WORK COVERED BY CONTRACT DOCUMENTS –Contractor shall be responsible for providing new liquid applied protective layer on top of ALL existing roof at ELC(with the exception of areas indicated as not in contract) and also to replace in kind select roof areas indicated on plan. The contractor shall remove and dispose in select areas the EPDM and wet insulation down original roof. Upon completion of the removal work, contractor shall replace roof in kind as indicated and tie-in to rest of the existing roof. Upon completion of this replacement work, the contractor shall field apply specified liquid product onto all the roof areas. Contractor shall examine carefully the work areas indicated on plan sheet A-1: wet areas 1 and 2, and roof areas a,b,c,d, and e.

Roof areas A,D and E shall be roof repair and new coating

Roof area C will be roof replacement and new coating
Roof area B is not in contract

A. In general, the work shall consist of but not be limited to the following:

- REPLACE ROOF ASSEMBLY IN ITS ENTIRETY AT WET AREAS 1 AND 2 DOWN TO BUILT-UP ROOF, AND REPLACE ROOF ASSEMBLY IN ITS ENTIRETY AT ROOF C DOWN TO WOOD DECK. THESE THREE AREAS ARE INDICATED ON PLAN A-1
- INSTALL PROTECTIVE COATING PRODUCTS ON ALL ROOF AREAS; REFER TO DIVISION 7 SPECIFICATIONS PROVIDED AS PART OF BID DOCUMENTS
- GENERAL CONTRACTOR SHALL PROVIDE ROOFING MATERIALS AS SPECIFIED IN THIS SPECIFICATION, NO SUBSTITUTION SHALL BE ACCEPTABLE.

B. LIST OF DRAWINGS, SPECIFICATIONS AND DOCUMENTS:

Drawings:

A0	COVER SHEET
A1	ROOF PLAN
A2.6	ORIGINAL ROOF PLAN (DATED 11.20.95)
A8.13	ORIGINAL ROOF DETAILS (DATED 11.20.95)

Specifications:

01100 – SUMMARY
02412 - SELECTIVE DEMOLITION
07015 - MODIFICATIONS TO EXISTING ROOFING
07220 - ROOF INSULATION & COVERBOARD - ELC-ROOF C ONLY
07250 - WEATHER BARRIERS
07550 - POLYURETHANE MODIFIED MEMBRANE ROOFING - ELC-ROOF C ONLY
07563 - FLUID APPLIED ROOFING RESTORATION AT ELC-ROOFS A, D & E-
07600 - SHEET METAL FLASHING & TRIM - ELC-ROOF C ONLY
07920 - JOINT SEALANTS

Misc. Related Documents:

- Wind Uplift Calculations
 - 1) ES-1 R-Mer Edge Coping - Chelsea ELC
 - 2) ES-1 R-Mer Edge Fascia - Chelsea ELC
 - 3) LS Uplift Calc - Chelsea ELC
- ELC roof tar leak document August of 2014
- detail_coping_cap
- detail_exhaust_fan_detail
- detail_metal_roof_edge
- detail_plumbing_stack
- detail_rml_wall_panel_w_modified_bitumen_roof_flashing
- detail_roof_drain
- Hazardous Materials Roof Survey – by Nover Armstrong

1.4 WORK SEQUENCE AND SCHEDULE

- A. The Construction Schedule shall be based on the work being completed by **October 31, 2016**, or other date as agreed to by the Director of Facilities Management for the Chelsea School Department.
- B. Contractor shall submit a schedule for each Phase of the Work indicating scheduled completion of work and identifying these intermediate milestones:
 - a. Start of Project Construction.
 - b. Delivery of Submittals.
 - c. Delivery of major equipment.
 - d. Completion of new installations.
 - e. Testing and commissioning.
 - f. Project Completion/Closeout.
- C. The construction schedule shall reflect these milestone dates:
 - a. Construction site staging.
 - b. Equipment delivery schedule.
 - c. Start of demolition and construction activity.
 - d. Completion of new installation.
 - e. Completion of roof work.
 - f. Project Completion/Closeout – submit all related warranties, Operations and Maintenance Manual, as well as training session to staff of Chelsea Public Facilities Department.

1.5 USE OF PREMISES/PERMITS/FEES

- A. General: Contractor will have limited use of premises for construction operations during construction period.
- B. Specific areas for staging and storage of construction materials will be identified by the Project Coordinator. Storage of materials shall be in contractor furnished locked containers. No additional charges will be accepted for lost or stolen material and tools.
- C. Contractor is advised that school is in session and work will be accomplished during normal school activities. No disruption, interruption, or any other contractor activity, including lifting and rigging operations, will adversely affect school operations. Contractor shall provide security for his tools, consumables, and to the various work areas during the period of construction.
- D. Contractor is advised that the school is located in a residential/commercial section of the city and vehicular access may at times become congested and/or difficult. The movement of the crane(s)--should it be required--used to access the roof levels, may require movement in off-peak hours and the use of premium labor. Scheduled completion of the various phases of the work may also require premium time. Contractor shall schedule this work accordingly.
- E. Contractor is also advised the installation of new roof presents some challenges for access at the Shurtleff School. All damages and repairs to existing facilities, including playarea or other spaces related to the facility, as a result of lifting, rigging and related construction activities, shall be repaired to the Owners satisfaction, and shall be the responsibility of the Contractor.

- F. Contractor shall obtain all permits and pay all fees to facilitate movement of crane and subsequent lifting activities, including, but not limited to, City of Chelsea Police Department Traffic Details.
- G. Contractor shall be responsible for all costs associated with debris removal and dumpster rentals and transportation.

1.6 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 48-division format and CSI/CSC's "MasterFormat" numbering system.
 - 1. Section Identification: The Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections are in numeric sequence; however, the sequence is incomplete. Consult the table of contents to determine numbers and names of sections in the Contract Documents.
 - 2. 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:
 - 3. 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.
 - 4. 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.

1.7 SUBMITTALS

- A. Five (5) copies of each submittal, as required by these specifications, shall be delivered for review by the Engineer. All submittals shall conform to the format as specified herein.
- B. Submittals shall be in a bound format, with a title page indicating the Project Identification, submittal title and specification reference.
- C. Submittals shall be made to expedite material and equipment delivery. No claim for delay will be entertained due to drawing submittal review.

- D. Payment will be made on a monthly basis predicated on Engineers and Owners representative review of the work and timely receipt of Shop drawings. Delays in receipt of shop drawings will be cause for delays in payment for work completed. Contractor is advised that his work will be accomplished "At Risk" without Engineer approved shop drawings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100

SECTION 02412 - 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 Chelsea ELC School

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 Architect 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 Architect 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 Architect.
- D. **Perform and or Engage a professional engineer to 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.

3.2 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.
- 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.

3.3 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.
 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
1. Building Structure and Shell: Reuse 100% of existing brick unless otherwise directed by architect and or facilities manager.
- C. 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.
- D. 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.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition **and cleaned** and reinstalled in their original locations after selective demolition operations are complete.

3.4 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 **and legally dispose of them in an EPA-approved landfill**.
 - 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.

3.5 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 02412

SECTION 07015 - MODIFICATIONS TO EXISTING ROOFING

PART 1 - GENERAL

1.2 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.3 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Modify existing roofing systems as required to accommodate new construction or equipment removal.

1.4 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

1.5 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Roofing system shall be designed to withstand Code required loads and wind speeds.
- D. Flashings: Provide base flashings, perimeter flashings, detail flashings and component materials that comply with requirements and recommendations in FMG 1-49 Loss Prevention Data Sheet for Perimeter Flashings; FMG 1-29 Loss Prevention Data Sheet for Above Deck Roof Components; NRCA Roofing and Waterproofing Manual (Fourth Edition) for Construction Details and MACNA Architectural Sheet Metal Manual (Fifth Edition) for Construction Details, as applicable.
- E. Certification: Upon completion of work of this Section, submit certification by existing roof manufacturer acknowledging that all work performed is acceptable and that the entire roof remains under warranty.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
 - 1. Base flashings and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Insulation attachment patterns.
 - 4. Setting Drawings showing layout, sizes, sections, profiles, and joint details of concrete pavers with paver support assemblies.
- C. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- D. Qualification Data: For Installer and manufacturer.
- E. Maintenance Data: For roofing system to include in maintenance manuals.
- F. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer.
- B. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 01. Review methods and procedures related to roofing system including, but not limited to, the following:
 - 1. Meet with the Architect, Owner, owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods 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. Examine deck substrate conditions and finishes for compliance with requirements, 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 will affect 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.

1.8 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, 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. Protect stored liquid material from direct sunlight.
 1. 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. Store in a dry location. 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.

1.9 PROJECT 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.

1.10 WARRANTY

- A. Roofing Contractor's Warranty: The roofing subcontractor shall supply Owner with a minimum two-year workmanship warranty for each roof. In the event any work related to the roofing, flashing, or metalwork is found to be defective within two years of substantial completion, the roofing contractor shall remove and replace such at no additional cost to the Owner. A copy of the roofing signed warranty shall be sent to the roofing system's manufacturer.
 1. The duration of the Roofing Contractor's two-year warranty shall run concurrent with the roofing system's manufacturer's existing warranty.
- B. Roofing Systems Manufacturer's Warranty: Maintain existing warranties. Coordinate with Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Compatibility: Provide products recommended by manufacturers to be fully compatible with indicated substrates. Provide separation materials as required to eliminate contact between incompatible materials.
 - 1. Furnish specific product acceptable to manufacturer of roofing membrane which will not compromise the roofing manufacturer's warranty.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Intent of this contract is to remove/dispose the EPDM and wet insulation down to the built-up roof, leaving built-up roof in-place. Then, replacing roof in kind and tie-in to existing roof. Contractor shall examine carefully the six areas indicated on plan: wet areas 1 and 2, and roof areas a,b,c,and d

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- D. Coordinate installing membrane roofing system components so underlayment, vapor retarder, insulation, and cover boards are not exposed to precipitation or left exposed at the end of the workday.

3.3 UNDERLAYMENT INSTALLATION

- A. Install underlayment board in a single layer over area to roof deck substrate with mechanical fasteners.

3.4 VAPOR-RETARDER INSTALLATION

- A. Install laminated-sheet vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches and 6 inches respectively. Stagger joints from underlayment board layer below. Bond vapor retarder to underlayment board as follows:
 - 1. Apply adhesive at rate recommended by vapor-retarder manufacturer. Seal laps with adhesive.
- B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.

3.5 INSULATION AND COVERBOARD INSTALLATION

- A. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.
- B. Install tapered insulation under area of roofing to conform to slopes indicated.
- C. Install layers of insulation under area of roofing to achieve required thickness. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- D. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding ¼ inch with insulation.
 - 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
- F. Adhesively Applied Insulation: Install each layer of insulation and secure to deck using adhesive specifically designed and sized for adhering specified board-type roof insulation to deck type.
 - 1. Adhere insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
 - 2. Adhere insulation to resist uplift pressure at corners, perimeter, and field of roof.
- G. Install cover board in a single layer over area to roof deck substrate as indicated. Stagger joints from insulation layer below.

3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of sheet flashings.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Coordinate with owner's independent testing agency to perform roof tests and inspections and to prepare test reports.
- B. Manufacturer's Technical Representative: Engage a qualified manufacturer's technical representative to perform roof tests and inspections and to prepare test reports.
- C. Final Roof Inspection: Engage roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
 - 1. Notify Architect and the Owner 48 hours in advance of date and time of inspection.
- D. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and the Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07015

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SECTION 07220 - ROOF DECK AND INSULATION; pertains to roof area C as indicated on sheet A-1

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. The General Contractor will procure the materials as specified herein. The Contractor will provide insulation, coverboard, fasteners, and all other products, tools, equipment and labor to complete the scope of work. All contractors bidding on this project must be a school approved applicator with a successful history of completed projects of similar scope/materials. Contractor to provide references of completed projects available for inspection by The Chelsea Public Schools.

1.2 SUMMARY

- A. Section includes roof insulation over the properly prepared deck substrate.
- B. Related Sections:
1. Section 07 05 00 – Common Work Procedures for Thermal and Moisture Protection.
 2. Section 07 62 00 – Sheet Metal Flashing and Trim.

1.3 REFERENCES

- A. American Society for Testing and materials (ASTM):
1. ASTM A167 Standard Specification for Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet and Strip.
 2. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
 3. ASTM B29 Standard Specification for Refined Lead.
 4. ASTM B32 Standard Specification for Solder Metal.
 5. ASTM C165 Standard Test Method for Measuring Compressive Properties of Thermal Insulation.
 6. ASTM C208 Standard Specification for Cellulosic Fiber Insulation Board.
 7. ASTM C209 Standard Test Method for Cellulosic Fiber Insulating Board.
 8. ASTM C272 Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
 9. ASTM C1396 Standard Specification for Gypsum Wallboard.
 10. ASTM C518 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 11. ASTM C578 Standard Specification for Perlite Thermal Insulation Board.
 12. ASTM C728 Standard Test Methods for Fire Test of Roof Coverings.
 13. ASTM C1289 Standard Specification for Faced Rigid Polyisocyanurate Thermal Insulation.
 14. ASTM D5 Standard Test Method for Penetration of Bituminous Materials.
 15. ASTM D36 Standard Test Method for Softening Point of Bitumen (Ring and Ball Apparatus).
 16. ASTM D312 Standard Specification for Asphalt Used in Roofing.
 17. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

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18. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 19. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 20. ASTM D1863 Standard Specification for Mineral Aggregate Used on Built-Up Roofs.
 21. ASTM D2126 Standard Test Method for Response of Rigid Cellular Plastics to Thermal Humid Aging.
 22. ASTM D2178 Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing.
 23. ASTM D4601 Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
 24. ASTM D5147 Standard Sampling and Testing Modified Bituminous Sheet Material.
- B. Cast Iron Soil Pipe Institute, Washington, D.C. (CISPI)
- C. Factory Mutual Research (FM):
1. Roof Assembly Classifications.
- D. National Roofing Contractors Association (NRCA):
1. Roofing and Waterproofing Manual.
- E. Underwriters Laboratories, Inc. (UL):
1. Fire Hazard Classifications.
- F. Warnock Hersey (WH):
1. Fire Hazard Classifications.
- G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- H. Steel Deck Institute, St. Louis, Missouri (SDI)
- I. Southern Pine Inspection Bureau, Pensacola, Florida (SPIB)
- J. Insulation Board, Polyisocyanurate (FS HH-I-1972)

1.4 SUBMITTALS

- A. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Division 01 Section Submittal Procedures. 01300.
- B. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.
- C. Provide a sample of each insulation type.
- D. Shop Drawings
1. Submit manufacturer's shop drawings indicating complete installation details of tapered insulation system, including identification of each insulation block, sequence of installation, layout, drain/scupper locations, roof slopes, thicknesses, crickets and saddles.

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2. Shop drawing shall include: Outline of roof, location of drains/scuppers, complete board layout of tapered insulation components, thickness and the average "R" value for the completed insulation system.

E. Certification

1. Submit roof manufacturer's certification that insulation fasteners furnished are acceptable to roof manufacturer.
2. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.5 QUALITY ASSURANCE

- A. Fire Classification, ASTM E-108.
- B. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.
- C. Manufacturer's Certificate: Certify that the roof system is adhered properly to meet or exceed the requirements of FM.
- D. Pre-installation meeting: Refer to Division 07 roofing specifications for pre-installation meeting requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
- B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.
- C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).
- D. Store materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site.

PART 2 – PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Refer to Division 01 Section "Common Product Requirements."
- B. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.
- C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.

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1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.
2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2 INSULATION MATERIALS

A. Thermal Insulation Properties and Approved Insulation Boards.

1. Rigid Polyisocyanurate Roof Insulation; ASTM C1289:
 - a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
 - b. Thickness: Two (2) layers of 2.5"
 - c. Compliances: UL, WH or FM
2. Tapered Polyisocyanurate Roof Insulation; ASTM C1289:
 - a. Qualities: Factory Tapered, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
 - b. Tapered Crickets/Saddles: 1/4":12"
 - c. Compliances: UL, WH or FM
3. Securock Roof Board
 - a. Qualities: Nonstructural, noncombustible, homogenous composition panel.
 - b. Board Size: Four by eight feet (4'x8').
 - c. Thickness: 1/2"
 - d. Compliances: UL, WH or FM listed under Roofing Systems.
 - e. Manufacturer: USG

2.3 RELATED MATERIALS

A. Fiber Cant and Tapered Edge Strips: Performed rigid insulation units of sizes/shapes indicated, matching insulation board or of perlite or organic fiberboard, as per the approved manufacturer.

1. Acceptable Manufacturers:
 - a. The Garland Company, Inc.
 - b. Celotex
 - c. Johns Manville
 - d. GAF
 - e. Approved Equivalent

B. Roof Deck Insulation Adhesive: Insul-Lock HR - Dual-component, high rise foam adhesive as recommended by insulation manufacturer.

1. Tensile Strength (ASTM D412).....250 psi
2. Density (ASTM D1875).....8.5 lbs./gal.
3. Viscosity (ASTM D2556).....22,000 to 60,000 cP.
4. 2` Peel Strength (ASTM D903).....17 lb/in.
5. 3` Flexibility (ASTM D816).....Pass @ -70°F

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- C. Fasteners: Corrosion resistant screw fastener as recommended by roof membrane manufacturer.
 - 1. Factory Mutual Tested and Approved with three (3) inches coated disc for I-90 rating, length required to penetrate metal deck one inch.

PART 3 – EXECUTION

3.1 EXECUTION, GENERAL

- A. Comply with requirements of Division 01 Section “Common Execution Requirements.”

3.2 INSPECTOR OF SURFACES

- A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.
 - 1. Verify that work which penetrates roof deck has been completed.
 - 2. Verify that wood nailers are properly and securely installed.
 - 3. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
 - 4. Do not proceed until defects are corrected.
 - 5. Do not apply insulation until substrate is sufficiently dry.
 - 6. Broom clean substrate immediately prior to application.
 - 7. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.

3.3 INSTALLATION

- A. Attachment with Mechanical Fasteners
 - 1. Approved insulation board shall be fully attached to the deck with an approved mechanical fastening system. As a minimum, the amount of fasteners shall be in accordance with manufacturer’s recommendation.
 - 2. Filler pieces of insulation require at least two fasteners per piece if size of insulation is less than four square feet.
 - 3. Spacing pattern of fasteners shall be as per manufacturer’s recommendations to meet the FM requirements. Placement of any fastener from edge of insulation board shall be a minimum of three inches, and a maximum of six (6) inches.
 - 4. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one (1) inch minimum for metal, wood and structural concrete decks where not specified by the manufacturer.
- B. Attachment with Insulation Adhesive
 - 1. Ensure all surfaces are clean, dry, free of dirt, debris, oils, loose ore embedded gravel, unadhered coatings, deteriorated membrane and other contaminants that may inhibit adhesion.
 - 2. Apply insulation adhesive directly to the substrate using a ribbon pattern with one half (1/2) inch wide beads 12 inches o.c., using either the manual applicator or an automatic applicator, at a rate of one (1) gallon per one hundred (150) square feet per cartridge.
 - 3. Immediately place insulation boards into wet adhesive. Do not slide boards into place. Do not allow the adhesive to skin over before installing insulation boards.
 - 4. Briefly step each board into place to ensure contact with the adhesive. Temporary weights must be utilized to ensure proper adhesion. Substrates with irregular surfaces

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may prevent the insulation board from making positive contact with the adhesive. Relief cuts may be required to ensure proper contact.

5. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.

3.4 CLEANING

- A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

3.5 CONSTRUCTION WASTE MANAGEMENT

- A. Remove and properly dispose of waste products generated during installation. Comply with requirements of authorities having jurisdiction.

END OF SECTION

SECTION 07250 - WEATHER BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Building paper.
2. Building wrap.
3. Flexible flashing.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For **water-resistive barrier and flexible flashing**, from ICC-ES.

PART 2 - PRODUCTS

2.1 WATER-RESISTIVE BARRIER

- A. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.
- B. Building Paper: Water-vapor-permeable, asphalt-saturated kraft building paper that complies with ICC-ES AC38, Grade D; **except with water-resistance rating not less than 1 hour.**
- C. Building Wrap: ASTM E 1677, Type I air barrier; 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.
1. Products: Subject to compliance with requirements, **available products that may be incorporated into the Work include, but are not limited to, the following**:
- a. Dow Chemical Company (The); Styrofoam Weathermate Plus Brand Housewrap.
 - b. DuPont (E. I. du Pont de Nemours and Company); Tyvek.
 - c. Ludlow Coated Products; [Air Stop Housewrap] [Barricade Building Wrap] [EnergyWrap Housewrap] [R-Wrap Protective House Wrap].
 - d. Pactiv, Inc.; GreenGuard.
 - e. Raven Industries Inc.; Fortress Pro Weather Protective Barrier.
 - f. Reemay, Inc.; Typar HouseWrap.

2. Water-Vapor Permeance: Not less than **50** g through 1 sq. m of surface in 24 hours per ASTM E 96/E 96M, Desiccant Method (Procedure A).
- D. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

2.2 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Self-adhesive butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, spunbonded polyolefin, or flexible stainless steel to produce an overall thickness of not less than 0.025 inch (0.6 mm).
1. Products: Subject to compliance with requirements, **provide one of the following**:
 - a. York Manufacturing, Inc.; York 304 SS
 - b. STS Coatings, Inc.; Gorilla Flash SS peel & stick butyl
 - c. Illinois Products, Inc.; IPCO Self-Adhesive Stainless Steel
 - d. TK Products, Inc.; TK Self-Adhering Stainless Steel TWF
 - e. Products in first four subparagraphs below are butyl rubber products.
 - f. DuPont (E. I. du Pont de Nemours and Company); DuPont Flashing Tape.
 - g. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Vycor Butyl Self Adhered Flashing.
 - h. Protecto Wrap Company; BT-25 XL.
 - i. Raven Industries Inc.; Fortress Flashshield.
 - j. Advanced Building Products Inc.; Wind-o-wrap.
 - k. Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
 - l. Fiberweb, Clark Hammerbeam Corp.; Aquafash 500.

PART 3 - EXECUTION

1. WATER-RESISTIVE BARRIER INSTALLATION

- a. Cover sheathing with water-resistive barrier as follows:
 - i. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
 - ii. Apply barrier to cover vertical flashing with a minimum 4-inch (100-mm) overlap unless otherwise indicated.

- b. Building Paper: Apply horizontally with a 2-inch (50-mm) overlap and a 6-inch (150-mm) end lap; fasten to sheathing with galvanized staples or roofing nails.
- c. Building Wrap: Comply with manufacturer's written instructions.
 - i. Seal seams, edges, fasteners, and penetrations with tape.
 - ii. Extend into jambs of openings and seal corners with tape.

2. FLEXIBLE FLASHING INSTALLATION

- a. Apply flexible flashing where indicated to comply with manufacturer's written instructions.
 - i. Lap seams and junctures with other materials at least 4 inches (100 mm) except that at flashing flanges of other construction, laps need not exceed flange width.
 - ii. Lap flashing over water-resistive barrier at bottom and sides of openings.
 - iii. Lap water-resistive barrier over flashing at heads of openings.

END OF SECTION 07250

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SECTION 07550 - POLYURETHANE MODIFIED MEMBRANE ROOFING; pertains to roof area C as indicated on sheet A-1

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. The General Contractor will procure the materials as specified herein. The Contractor will provide insulation, coverboard, fasteners, and all other products, tools, equipment and labor to complete the scope of work. All contractors bidding on this project must be a school approved applicator with a successful history of completed projects of similar scope/materials. Contractor to provide references of completed projects available for inspection by The Chelsea Public Schools.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry.
- B. Section 06114 - Wood Blocking and Curbing: Wood nailers and cant strips.
- C. Section 07220 - Insulation Board: Insulation and fastening.
- D. Section 07600 - Sheet Metal Flashing and Trim: Weather protection for base flashings.
- E. Section 07600 - Manufactured Roof Specialties: Counter flashing gravel stops, and fascia.

1.3 REFERENCES

- A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.
- C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
- D. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
- E. ASTM D 1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
- F. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
- G. ASTM D 2822 Standard Specification for Asphalt Roof Cement.
- H. ASTM D 2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.
- I. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.
- J. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
- K. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous

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Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

- L. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
- M. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- N. ASTM D 6757 - Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.
- O. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings
- P. Factory Mutual Research (FM): Roof Assembly Classifications.
- Q. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.
- R. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- S. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.
- T. Warnock Hersey (WH): Fire Hazard Classifications.
- U. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.
- V. ASCE 7-05, Minimum Design Loads for Buildings and Other Structures
- W. UL - Fire Resistance Directory.
- X. FM Approvals - Roof Coverings and/or RoofNav assembly database.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Perform work in accordance with all federal, state and local codes.
- B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings as follows:
 - 1. Factory Mutual Class A Rating.
 - 2. Underwriters Laboratory Class A Rating.
 - 3. Warnock Hersey Class A Rating.
- C. Design Requirements:
 - 1. Uniform Wind Uplift Load Capacity
 - a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
 - 1) Design Code: ASCE 7-10
 - 2) Importance Category: III
 - 3) Importance Factor of: 1.15
 - 4) Wind Speed: 105 mph
 - 5) Ultimate Pullout Value: 364 lbs
 - 6) Exposure Category: B
 - 7) Roof Pitch: 1/2 inch:12 inches
 - 8) Roof Area Design Uplift Pressure:
 - a) Zone 1 - Field of roof 25.6 psf - 12 fasteners per 4' x board
 - b) Zone 2 - Eaves, ridges, hips and rakes 43.0 psf - 18 fasteners per 4' x 8'

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- board
- c) Zone 3 - Corners 64.7 psf - 24 fasteners per 4' x 8' board
- d) Edge Zone Width: 5 feet

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions.
- C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.
- D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7-10 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.
- E. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.
- G. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.
- H. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwriters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.
- I. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.
- C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

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- E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section.
- B. Review installation procedures and coordination required with related Work.
- C. Inspect and make notes of job conditions prior to installation:
 - 1. Record minutes of the conference and provide copies to all parties present.
 - 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
 - 3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 40 degree F (4 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

- A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

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- A. Upon completion of the work, provide the Manufacturer's written and signed Edge-To-Edge NDL System Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installer, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition, including Manufacturer's metal components. Annual inspections to be provided by the manufacturer for the length of the warranty period at no additional cost
 - 1. Warranty Period:
 - a. 25 plus 15 (40 years): 25 years from date of acceptance, plus 15 is additional years after required inspection by Garland.
- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
 - 1. Warranty Period:
 - a. 2 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: The Garland Company, Inc.; 3800 E. 91st St.; Cleveland, OH 44105; Email: bwall@garlandind.com; Web: <http://www.garlandco.com>

2.2 COLD APPLIED 2-PLY ROOF SYSTEM

- A. Rosin Paper: One layer of Kraft paper to be installed over the entire substrate.
- B. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - 1. StressBase 80
- C. Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - 1. OptiMax FR Mineral
- D. Interply Adhesive:
 - 1. Weatherking Adhesive
- E. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive:
 - 1. StressBase 80
- F. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - 1. OptiMax FR Mineral
- G. Flashing Ply Adhesive:
 - 1. Weatherking Flashing Adhesive

2.3 ACCESSORIES:

- A. Roof Insulation: In accordance with Section 07220.
- B. Drains: Provide new cast iron drain assemblies at current drain locations to fit the existing plumbing. Include cast iron clamping rings, strainers and all accessories, as required.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Pitch pans, Rain Collars and Plumbing Stacks should be fabricated from 20 oz. (567gram) copper. All joints should be welded/soldered watertight. See details for design.

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- B. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
- C. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07600.
 - 1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.
- D. Manufactured Roof Specialties: Manufactured copings, fascia, wall panels, gravel stops and related flashings and trim are specified in Section 07600.
 - 1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.
- C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. General: Clean surfaces thoroughly prior to installation.
 - 1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - 2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
 - 3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
 - 4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
 - 5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
- A. Wood Deck:
 - 1. Dimensional wood deck shall be minimum 1 inch (25 mm) thick, knotholes and cracks larger than 1/4 inch shall be covered with sheet metal. All boards shall be appropriately nailed and have adequate end bearing to the centers of beams/rafters. Lumber shall be kiln dried.
 - 2. Plywood shall be a minimum 15/32 inch (11.9 mm) thick and conform to the standards and installation requirements of the American Plywood Association (APA).
 - 3. Provide an approved base sheet nailed appropriately for the specified roof system, with 1 inch (25 mm) diameter caps and annular nails unless otherwise required by the applicable Code or Approval agency.
 - 4. Insulation is to be mechanically attached and cover board is to be adhered in accordance with the manufacturer's requirements.
 - 5. In all retrofit roof applications, it is required that deck be inspected for defects. Any defects are to be corrected per the deck manufacturer's recommendations and standards of the APA/Engineered Wood Association prior to new roof application.

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B. Re-Roofing Applications:

1. Remove existing roofing, insulation and flashings from curbs and parapet walls down to the wood substrate deck. Remove existing flashings at roof drains and roof penetrations.
2. Install mechanically attached base sheet over the entire substrate.
3. Install new wood nailers as necessary to accommodate insulation/recovery board or new nailing patterns.
4. When fastened, the fastening pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer.
5. When adhered, the adhesion pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer.
6. Install tapered crickets/saddles between drains/scuppers, and on the upslope side of curbs to ensure positive drainage using a 2:1 length to width ratio per NRCA recommendations.
7. Provide tapered edge along perimeter to promote positive drainage, as necessary.

3.3 INSTALLATION - GENERAL

- A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.
- B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
 1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
 2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.
 3. All sheets are to be rolled into place using a weighted lawn roller to ensure sheets are fully bonded to the substrate.
- C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

3.4 INSTALLATION COLD APPLIED ROOF SYSTEM

- A. Base Ply: Install in interply adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.
 1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
 3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
 4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the base layers but the laps shall not coincide with the laps of the base layers.
 5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
 6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.

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- B. Cap Ply: Install in interply adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.
1. The laps of the asphalt membrane should only be hot air welded with an electric type hot air welder. When hot air welding laps, the adhesive should be applied at the specified rate to the entire roll area up to 4" from the side lap and 8" from the end lap.
 2. The membrane shall be set into the adhesive and pressed into place by brooming or rolling to ensure contact with the adhesive under the membrane.
 3. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 4. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
 5. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
 6. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the base layers but the laps shall not coincide with the laps of the base layers.
 7. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
 8. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.
- C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.
- D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified.
1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
 2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
 3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
 4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.
- E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07600. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.
- F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.
- G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
 2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
 3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.

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4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.
 5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
 6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
 7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
 8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.
- H. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the base ply.
1. The laps of the asphalt membrane should only be hot air welded with an electric type hot air welder. When hot air welding laps, the adhesive should be applied at the specified rate to the entire roll area up to 4" from the side lap and 8" from the end lap.
 2. The membrane shall be set into the adhesive and pressed into place by brooming or rolling to ensure contact with the adhesive under the membrane.
 3. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
 4. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
 5. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
 6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
 7. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
 8. All stripping shall be installed prior to flashing cap sheet installation.
 9. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
 10. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

- A. Pre-Manufactured Metal Fascia System:
1. Position base plies of the built-up and/or modified roofing membrane over the roof edge covering nailers completely, fastening 8 inches (203 mm) on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
 2. Cant Dam: Install Cant Dam overlapping Cant a minimum of 1 inch. Fasten Cant Dam every 3 inches on center through the top of nailer and outside face.
 3. BUR or Modified Flashing: Prime Cant Dam at a rate of 100 square feet per gallon and allow to dry.
 4. Strip in Cant Dam with base flashing membrane extending 6 inches (152 mm) into roof field, followed with a cap sheet extending 9 inches into the roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
 5. Fascia Cover: Install fascia cover with splice plate under one end by pressing downward firmly until "snap" occurs and cover is engaged along entire length of miter. Field cut where

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necessary with fine tooth saw.

6. Sealant is to be placed between splice plates on metal edge pieces.
7. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof.

B. Pre-Manufactured Metal Coping Cap:

1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches (609 mm). Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Attach tapered board to top of wall.
4. Install base flashing ply covering entire wall and wrapped over top of wall and down face with 6 inches (152 mm) on to field of roof and set in cold asphalt. Nail membrane at 8 inches (203 mm) o.c.
5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all seams and allow to cure and aluminize.
6. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
7. Install new metal coping cap hooked to continuous cleat.
8. Fasten inside cap 24 inches (609 mm) o.c. with approved fasteners and neoprene washers through slotted holes, which allow for expansion and contraction.

C. Pre-Manufactured Wall Panel W/Modified Bitumen Roof/Flashing:

1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering wall with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install manufacturer's standard hat channel into the top of the modified membrane to act as a termination bar.
6. Install hat channels vertically spaced up the wall and fastened in accordance with the wind uplift calculation requirements.
7. Install the uppermost hat channel at the bottom edge of the coping cap. Insert rigid insulation between the hat channels. Apply manufacturer' standard seam tape on top of all hat channels.
8. Fasten the first manufactured wall panel vertically plumb and fasten every 6 inches (152 mm) o.c.
9. Install adjoining panels by engaging the opposing interlocking seam and fastening as described above.
10. Complete inside and outside corners by installing pre-fabricated corners or job site braking a full width panel to accommodate the corner so that the sides engage the lock of the panels to the corner areas.
11. Trim excess seam tape and seam raw edges with manufacturer's recommended sealant.

D. Curb Detail/Air Handling Station:

1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.

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5. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
 6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.
- E. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
 2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
 3. Run roof system plies over drain. Cut out plies inside drain bowl.
 4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
 5. Install base flashing ply (40 inch square minimum) in bitumen.
 6. Install modified membrane (48 inch square minimum) in bitumen.
 7. Install clamping ring and assure that all plies are under the clamping ring.
 8. Remove drain plug and install strainer.
- F. Plumbing Stack:
1. Minimum stack height is 12 inches (609 mm).
 2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
 3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
 4. Install base flashing ply in bitumen.
 5. Install membrane in bitumen.
 6. Caulk the intersection of the membrane with elastomeric sealant.
 7. Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.

3.6 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

- A. Inspection: Provide manufacturer's daily field observations and a final inspection upon completion of the Work.
 1. Warranty shall be issued upon manufacturer's acceptance of the installation.
 2. Daily field observations shall be performed by a Technical Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve roofing installations for the manufacturer.
 3. Daily roofing progress reports must include; photographic documentation of work in-progress and written statements of compliance with details/shop drawings, weather conditions, and any discrepancies found during inspection.
 4. Daily field inspections shall be performed at no additional cost to the Owner.
 5. Progress reports must be published to an online database accessible to the Owner/Architect.
 6. Provide a final report from the Technical Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good

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general roofing practice.

3.8 SCHEDULES

A. Base (Ply) Sheet:

1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
 - 2) 50mm/min. @ 23 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 110 lbf
 - 2) 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 489 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4 % XD 4 %
 - 2) 50mm/min@ 23 +/- 2 deg. C MD 4 % XD 4 %
 - d. Low Temperature Flexibility, ASTM D 5147, Passes -20 deg. F (-28.8 deg. C)

B. Cap (Ply) Sheet:

1. OptiMax FR Mineral: 145 mil mineral surfaced, polyurethane modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim. ASTM D 6163, Type III Grade G
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 205 lbf/in XD 215 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 36.0 kN/m XD 38.0 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C D 1334 N XD 1334 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.7% XD 5.0%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 4.7% XD 5.0%
 - d. Low Temperature Flexibility, ASTM D 5147, Passes 0 deg. F (-18 deg. C)

C. Interply Adhesive:

1. Weathering: Rubberized, polymer modified cold process asphalt roofing bitumen V.O.C. compliant ASTM D 3019. Performance Requirements:
 - a. Non-Volatile Content ASTM D 4479 70%
 - b. Density ASTM D1475 8.9 lbs./gal.
 - c. Viscosity Stormer ASTM D562 400-500 grams
 - d. Flash Point ASTM D 93 100 deg. F min. (37 deg. C)
 - e. Slope: up to 3:12

D. Flashing Base Ply:

1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
 - 2) 50mm/min. @ 23 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 110 lbf
 - 2) 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 489 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4 % XD 4 %
 - 2) 50mm/min@ 23 +/- 2 deg. C MD 4 % XD 4 %

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- d. Low Temperature Flexibility, ASTM D 5147
 - 1) Passes -20 deg. F (-28.8 deg. C)

- E. Flashing Ply Adhesive:
 - 1. Weathering Flashing Adhesive: Brush grade flashing adhesive.
 - a. Non-Volatile Content ASTM D 4479 70 %.
 - b. Density ASTM D 1475 8.6 lbs./gal. (1kg/l)
 - c. Flash Point ASTM D 93 100 deg. F (37 deg. C)

- F. Flashing Cap Ply:
 - 1. OptiMax FR Mineral: 145 mil mineral surfaced, polyurethane modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim. ASTM D 6163, Type III Grade G
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 205 lbf/in XD 215 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 36.0 kN/m XD 38.0 kN/m
 - b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C D 1334 N XD 1334 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.7% XD 5.0%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 4.7% XD 5.0%
 - d. Low Temperature Flexibility, ASTM D 5147, Passes 0 deg. F (-18 deg. C)

END OF SECTION

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SECTION 07563 - FLUID APPLIED ROOFING RESTORATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Single Ply Roof Restoration

1.2 RELATED SECTIONS

- A. The General Contractor will procure the materials as specified herein. The Contractor will provide insulation, coverboard, fasteners, and all other products, tools, equipment and labor to complete the scope of work. All contractors bidding on this project must be a school approved applicator with a successful history of completed projects of similar scope/materials. Contractor to provide references of completed projects available for inspection by The Chelsea Public Schools.

1.3 REFERENCES

- A. ASTM D 75 - Standard Practice for Sampling Aggregates.
- B. ASTM D 93 - Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.
- C. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
- D. SRI - Solar Reflectance Index calculated according to ASTM E 1980.
- E. SMACNA Architectural Sheet Metal Manual.
- F. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.

1.4 SYSTEM DESCRIPTION:

- A. Single Ply Roof Repair work includes:
 1. Surface preparation: Remove membrane chalking, dust, dirt, and debris.
 2. Fascia Edges: Inspect and make repairs to deteriorated membrane.
 3. Parapets and Vertical Surfaces: Inspect and make repairs to any splits or membrane deterioration.
 4. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
 5. Roof Repairs: Repair blisters, stressed or cracked membrane. Cut back, patch with new membrane.
 6. Roof Replacement: Remove and dispose of all wet insulation/coverboard and EPDM membrane, and replace in kind.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- B. Verification Samples: For each product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, and color.

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- C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- D. No substitutions without approval by owner
- E. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Manufacturer: Company specializing in manufacturing products specified in this section with documented ISO 9001 certification and minimum twelve years and experience.
- C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
- E. Installer shall have sole responsibility for accuracy of all measurements, material quantities, existing roof composition, sizes and other site conditions that will affect the work.
- F. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- G. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION CONFERENCE

- A. Convene a pre-roofing conference approximately two weeks before scheduled commencement of roofing system installation and associated work.
- B. Require attendance of installers of deck or substrate construction to receive roofing, installers of rooftop units and other work in and around roofing which must precede or follow roofing work including mechanical work, Architect, Owner, roofing system manufacturer's representative.
- C. Objectives include:
 - 1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
 - 2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work.
 - 3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
 - 4. Review roofing system requirements, Drawings, Specifications and other Contract Documents.
 - 5. Review and finalize schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
 - 6. Review required inspection, testing, certifying procedures.

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7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
8. Record conference including decisions and agreements reached. Furnish a copy of records to each party attending.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Weather Condition Limitations: Do not apply roofing system during inclement weather or when a 40 percent chance of precipitation or greater is expected.
- C. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- E. When applying materials with spray equipment, take precautions to prevent over spray and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles or other property. Care should be taken to do the following:
 1. Close air intakes into the building.
 2. Have a dry chemical fire extinguisher available at the jobsite.
 3. Post and enforce "No Smoking" signs.
- F. Avoid inhaling spray mist; take precautions to ensure adequate ventilation.
- G. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.
- H. Take precautions to ensure that materials do not freeze.

Roof Repair, Replace, Renovation

- I. Minimum temperature for application is 40 degrees F (4 degrees C) and rising for solvent based materials and 50 degrees F (10 degrees C) and rising for water based.

1.10 WARRANTY

- A. Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
 - 1. Warranty Period:
 - a. 5 plus 5 (10 years): 5 years from date of acceptance, plus 5 additional years after required inspection by Garland.
- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
 - 1. Warranty Period:
 - a. 2 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: The Garland Company, Inc.; 3800 E. 91st St.; Cleveland, OH 44105; Email: bwall@garlandind.com; Web: <http://www.garlandco.com>

2.2 ROOF RESTORATION SYSTEM FOR SINGLE PLY ROOFS

- A. White-Knight Plus:
 - 1. Primer: None required.
 - 2. EPDM Flashing: Repair or replace as needed.
 - 3. Reinforcement: Apply White-Knight Plus Base Coat on all seams and around penetrations only. Embed one (1) layer of Ulti-Mat or Grip Polyester Soft in the uncured coating. Include fabric reinforcement at new membrane tie-ins.
 - 4. Coating: Apply White-Knight Plus on entire surface of the EPDM roof and flashing area.

2.3 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.
- B. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer. Include six (6) vents.
- C. Pitch pans and Rain Collars - 20oz (567gram) copper. All joints should be welded/soldered watertight; include necessary clamps and polyurethane sealant.
- D. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07600.
 - 1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

PART 3 EXECUTION

Roof Repair, Replace, Renovation

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

3.2 ROOF PREPARATION AND REPAIR

- A. General:
 - 1. Remove all wet and deteriorated roofing membrane and insulation (EPDM and fiberboard - top roof only) and replace with like kind to create a smooth, even surface for application of new roof membrane. Refer to Infrared Survey provided for approximate locations/quantities. Additional wet areas may be located during construction and will be addressed using the line item replacement cost per square foot noted on the bid form.
 - 2. When mechanically attached, the fastening pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer. Include all fasteners and accessories.
 - 3. Install new cured EPDM membrane to field and flashings at all retro-fit areas. Include all membrane cleaner, primers, splice adhesives and cements, lap sealant, tapes and coverstrip, as required to complete watertight assembly.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Repair all defects such as deteriorated roof decks; replace saturated insulation board, replace loose or brittle membrane or membrane flashings. Verify that existing conditions meet the following requirements:
 - 1. Existing membrane is either fully adhered or that the membranes mechanical fasteners are secured and functional.
 - 2. Application of roofing materials over a brittle roof membrane is not recommended.
- D. Remove all loose dirt and foreign debris from the roof surface. Do not damage roof membrane in cleaning process.
- E. Clean and seal all parapet walls, fascia and coping caps, and repair any damaged metal where necessary. Seal watertight all fasteners, pipes, drains, vents, joints and penetrations where water could enter the building envelope.
- F. Clean the entire roof surface by removing all dirt, algae, paint, oil, talc, rust or foreign substance. Use a 10 percent solution of TSP (tri-sodium phosphate), Simple Green and warm water. Scrub heavily soiled areas with a brush. Rinse with fresh water to remove all TSP solution. Allow roof to dry thoroughly before continuing.
- G. Repair existing roof membrane as necessary to provide a sound substrate for the liquid membrane. All surface defects (cracks, blisters, tears) must be repaired with similar materials.
- H. Pre-Treatment of Known Growth - General Surfaces: Once areas of moss, mold, algae and other fungal growths or vegetation have been removed and surfaces have also been thoroughly cleaned, apply a biocide wash at a maximum spread rate of 0.2 gallons/square (0.08 liters/m), to guard against subsequent infection. Allow to dry onto absorbent surfaces before continuing with the application. On non-absorbent surfaces, allow to react before thoroughly rinsing to remove all traces of the solution.

3.3 INSTALLATION

- A. General Installation Requirements:
 - 1. Install in accordance with manufacturer's instructions. Apply to minimum coating thickness

Roof Repair, Replace, Renovation

- required by the manufacturer.
- 2. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
- 3. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore work damaged by installation of the roofing system.
- 4. Keep roofing materials dry during application. Phased construction can be allowed as long as no, more than 7 days pass between coats.
- 5. Coordinate counter flashing, cap flashings, expansion joints and similar work with work specified.
- 6. Coordinate roof accessories and miscellaneous sheet metal accessory items, including piping vents and other devices with work specified.

B. Single Ply Roof Restoration work includes:

- 1. Surface preparation: Remove membrane chalking, dust, dirt, and debris.
- 2. EPDM Flashings:
 - a. Fascia Edges: Inspect and make repairs to membrane.
 - b. Parapets and Vertical Surfaces: Inspect and make repairs to any splits or membrane deterioration.
 - c. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
- 3. Reinforcement: Treatment of field seams and penetrations
 - a. Application of White-Knight Plus Base Coat on field seams, flashings and around penetrations.
 - 1) Verify that the surface to be coated is properly prepared.
 - 2) Restore the surface to a suitable condition if roof surface becomes contaminated with dirt, dust or other materials that will interfere with adhesion of the coatings.
 - 3) Materials must be applied at specified wet film thickness.
 - 4) Apply White-Knight Plus at minimum 6 inch wide stripe over all seams, flashings and around penetrations at 2.0 gallons per 100 SF.
 - 5) Embed Ulti-Mat or Grip Polyester Soft at all field, flashing and tie-in seams.
 - 6) Allow to dry for a minimum of 24 hours before applying finish coats.
 - 7) On vertical surfaces to achieve proper application rate cut your application into two coats to avoid sagging and runs of coating.
- 4. Coating: Application of White-Knight Plus finish coats.
 - a. Apply White-Knight Plus in a uniform manner.
 - b. Use special attention to coating flashings and other critical areas to build adequate membrane thickness.
 - c. Use multiple light coats on vertical surfaces to prevent sagging.
 - d. Apply at 2.0 gallons per 100 SF over the entire roof surface.

3.4 CLEANING

- A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
- B. Remove asphalt markings from finished surfaces.
- C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.5 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.

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- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.
- E. The Contractor shall assume full responsibility for protection of existing building walls, windows, grounds and all adjacent personal property during construction until Substantial Completion, and shall be liable for any damages or overspray to any surfaces caused by failure to supply proper care and protection.

3.6 FIELD QUALITY CONTROL

- A. Inspection: Provide manufacturer's daily field observations and a final inspection upon completion of the Work.
 - 1. Warranty shall be issued upon manufacturer's acceptance of the installation.
 - 2. Daily field observations shall be performed by a Technical Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve roofing installations for the manufacturer.
 - 3. Daily roofing progress reports must include; photographic documentation of work in-progress and written statements of compliance with details/shop drawings, weather conditions, and any discrepancies found during inspection.
 - 4. Daily field inspections shall be performed at no additional cost to the Owner.
 - 5. Progress reports must be published to an online database accessible to the Owner/Architect.
 - 6. Provide a final report from the Technical Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.7 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, roofing system manufacturer's representative and others directly concerned with performance of roofing system.
- B. Walk roof surface areas, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.
- C. If core cuts verify the presence of damp or wet materials, the installer shall be required to replace the damaged areas at his own expense.
- D. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation that is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

3.8 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.9 SCHEDULES

Roof Repair, Replace, Renovation

- A. Base Coat (Seams and Penetrations Only):
1. White-Knight Plus Base Coat: Multi- purpose, single-component aliphatic urethane, liquid waterproofing membrane.
 - a. Tensile Strength: ASTM D 412, 2100 psi
 - b. Tear Resistance: ASTM D 624, 160 lbs./in
 - c. Elongation: ASTM D 412, 320%
 - d. Density @ 77 degrees F (25 degrees C, ASTM D 2939) 10.4 lb./gal (1.2 g/m³)
 - e. Flash Point: ASTM D 93, 110 degrees F min. (43 degrees C)
 - f. Non-Volatile: ASTM D 75, Typical 83%
 - g. Viscosity @ 77 degrees F (25 degrees C); Brookfield RVT, #4 Spindle 10 rpm, 9100 cP
 - h. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m²), 32 mils (812.8 microns)
 - i. VOC: 225 g/l
 - j. Color: Gray
- B. Reinforcement (All Seams):
1. Ultri-Mat: fiberglass reinforcing fabric with resin binder
- C. Reinforcement (All Seams):
1. Grip Polyester Soft: elastic, polyester reinforcing fabric
 - a. Tensile Strength: ASTM D 1682, 57.1 lbs
 - b. Tear Strength: 16.1 lbs.
 - c. Elongation: 61.65%
 - d. Mullen Burst: 176 lbs.
- D. Top Coat (Entire Roof Area):
1. White-Knight Plus: highly reflective multi- purpose, single-component aliphatic urethane, liquid waterproofing membrane.
 - a. Tensile Strength: ASTM D 412, 2100 psi
 - b. Tear Resistance: ASTM D 624, 160 lbs./in
 - c. Elongation: ASTM D 412, 320%
 - d. Density @ 77 degrees F (25 degrees C, ASTM D 2939) 10.4 lb./gal (1.2 g/m³)
 - e. Flash Point: ASTM D 93, 110 degrees F min. (43 degrees C)
 - f. Non-Volatile: ASTM D 75, Typical 83%
 - g. Viscosity @ 77 degrees F (25 degrees C); Brookfield RVT, #4 Spindle 10 rpm, 9200 cP
 - h. Wet Film Thickness @ 2 gal./100 sq. ft. (0.82 l/m²), 32 mils (812.8 microns)
 - i. VOC: 225 g/l
 - j. Color: White
 - k. Reflectance: 0.87
 - l. Emittance: 0.90
 - m. SRI: 111

END OF SECTION

SECTION 07600 -SHEET METAL FLASHING AND TRIM; ; pertains to roof area C as indicated on sheet A-1

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. The General Contractor will procure the materials as specified herein. The Contractor will provide insulation, coverboard, fasteners, and all other products, tools, equipment and labor to complete the scope of work. All contractors bidding on this project must be a school approved applicator with a successful history of completed projects of similar scope/materials. Contractor to provide references of completed projects available for inspection by The Chelsea Public Schools.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy-Coated (galvannealed) by the Hot-Dip Process.
2. ASTM A792 Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.
3. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
4. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
5. ASTM D692 Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
6. ASTM B32 Solder Metal
7. ASTM B486 Paste Solder
8. ASTM D226 Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
9. ASTM D486 Asphalt Roof Cement, Asbestos-free

B. American National Standards Institute and Single Ply Roofing Institute (ANSI/SPRI)

1. ANSI/SPRI ES-1 Testing and Certification Listing of Pre-Manufactured Fabricated Edge Metal and Pre-Manufactured Metal Coping Cap.

C. Warnock Hersey International, Inc., Middleton, WI (WH)

D. Factory Mutual Research Corporation (FMRC)

E. Underwriters Laboratories (UL)

F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

1. 1993 Edition Architectural Sheet Metal Manual

G. National Roofing Contractors Association (NRCA)

1. Roofing and Waterproofing Manual

H. American Society of Civil Engineers (ASCE)

1. ASCE 7-05 Minimum Design Loads for Buildings and Other Structures.

I. FS QQ-L-201 - Specification for Lead Sheet

J. FS O-F-506 - Flux, Soldering, Paste and Liquid

1.4 SUBMITTALS

A. Submit under provisions of this specification.

B. Product Data: Provide manufacturer's specification data sheets for each product.

C. Submit two samples, 12 x 12 inch in size illustrating typical external corner, internal corner, valley, junction to vertical dissimilar surface, material and finish.

D. Shop Drawings

1. For manufactured and ANSI/SPRI approved pre-manufactured metal edge fascia, copings, wall panel systems, and all other sheet metal fabrications.
2. Shop drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashing, termination's, and installation details.
3. Indicate type, gauge and finish of metal.

E. Sample Warranty

1. Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner. Warranty shall be provided from one manufacturer and part of a total Edge-to-Edge roof warranty that includes the polyurethane modified membrane roof system and pre-fabricated metal edge system.

F. Certification

1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.

G. Manufacturer's Product Data

1. Metal material characteristics and installation recommendations.
2. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specified can be approved.

1.5 QUALITY ASSURANCE

A. Reference Standards

1. Comply with details and recommendations of SMACNA Manual for workmanship, methods of joining, anchorage, provisions for expansion, etc.
- B. If required, fabricator/installer shall submit work experience and evidence of adequate financial Responsibility. The owner's representative reserves the right to inspect fabrication facilities in determining qualifications.
- C. Successful contractor must obtain all components of roof system from a single manufacturer including any roll good materials if required. Any secondary products that are required, which cannot be supplied by the specified manufacturer, must be recommended and approved in writing by primary manufacturer prior to bid submittal.
- D. Manufacturer shall have in place a documented, standardized method for maintaining quality control such as ISO-9001 approval.
- E. The roof material manufacturer shall conduct all required daily inspections of work in progress as described herein and shall furnish written documentation of all such inspections.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.
- B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.7 JOB CONDITIONS

- A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal roofing system.
- B. Protection:
 1. Provide protection or avoid traffic on completed roof surfaces.
 2. Do not overload roof with stored materials.
 3. Support no roof-mounted equipment directly on the roofing system.
- C. Ascertain that work of other trades which penetrates the roof or is to be made watertight by the roof, is in place and approved prior to installation of roofing.

1.8 DESIGN AND PERFORMANCE CRITERIA

- A. ANSI/SPRI ES-1 (Pre-manufactured Metal Edge Fascia System)
 1. ANSI/SPRI ES-1 test reports must be submitted for specific project wind uplift requirements per Section 1.16 Design and Performance Criteria within Modified Bituminous Membrane Roofing specification.
- B. Thermal expansion and contraction:

1. Completed metal edge fascia and cant dam system shall be capable of withstanding unlimited thermal expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

1.9 WARRANTIES

A. Material Manufacturer's Warranty

1. Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.
2. Warranty shall include the modified roof system, pre-manufactured metal edge fascia system, flashings and the transition between all systems, and shall be an Edge-to-Edge roof warranty; provided by ONE manufacturer.

B. Contractor's Warranty

1. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two (2) years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pre-Manufactured Metal Systems: R-Mer Edge Snap-On Fascia / Snap-On Coping / R-Mer Wall-Pan; The Garland Co., Cleveland, OH.

1. Fascia, copings and wall panels shall be .040" Kynar coated aluminum. Cant dam, coping chairs and hat channels shall be 22 ga. galvanized and continuous for the entire roof edge.
2. All submittals for approved equals shall conform to Sections 1.5 Quality Assurance and 1.8 Design & Performance Criteria.
3. Provide a manufacturer's Edge-to-Edge roof warranty. Warranted materials shall be free of defects in material and workmanship for five years after shipment. The manufacturer will also furnish their standard decorative finish warranty.
4. Fascia extenders, wall panels and any other accessories shall be fabricated from 0.040" aluminum with Kynar finish or approved equal.
5. Color to be selected by Architect from manufacturer's standard color range.

B. Pitch pockets and plumbing sleeves shall be 20 oz. copper, and have all corners soldered, and a continuous 4" wide minimum deck flange at corners.

C. Miscellaneous Metals and Flashings:

1. Surface Mounted Counterflashings: Kynar finished Aluminum, 0.040 inch thick.
2. Equipment Slip Flashing: Mill finished Aluminum, 0.040 inch thick.

3. Flat Stock - Custom Fabricated Trim: Kynar finished Aluminum, 0.040 inch thick.
4. Solder for Stainless Steel: ASTM B 32, Grade Sn60, used with an acid flux of type recommended by stainless-steel sheet manufacturer; use a noncorrosive rosin flux over tinned surfaces.
5. Solder for Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
6. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened. Exposed fasteners shall have a neoprene or other suitable weatherproofing washer.
7. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil dry film thickness per coat.
8. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
9. Sealing Tape: Pressure sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
10. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.
11. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.
12. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.
13. Zinc-Coated Steel Sheet: ASTM A526, 0.20% copper, 26 gage (0.0179"); designation G90 hot-dip galvanized, mill phosphatized.
14. Stainless Steel Sheet: Type 302/304, ASTM A167, 26 gage, (0.0217"), annealed except dead soft where fully concealed by other work, 2D (dull) finish.
15. Copper Sheet: ASTM B370, 20 oz., temper H00 (cold-rolled).
16. Lead-Coated Copper Sheet: ASTM B101. Type I, Class A (12-15 1 lb. of lead coating per 100 sq. ft.), 17.1 oz. (0.022").
17. Zinc Alloy Sheet: Zinc with 0.6% copper and 0.14% titanium; 0.27" thick (21 gauge); standard (soft) temper, mil finish.

2.2 RELATED MATERIALS

- A. Metal Primer: Zinc chromate type.
- B. Plastic Cement: ASTM D 4586
- C. Sealant: As required by material manufacturer.

- D. Lead: Meets Federal Specification QQ-L-201, Grade B, four (4) pounds per square foot.
- E. Solder: ANSI/ASTM B32; 95/05 type.
- F. Flux: FS O-F-506.
- G. Underlayment: Ply of specified base flashing modified membrane or approved equal.
- H. Fasteners:
 - 1. Nails and Fasteners: Non-ferrous metal or hot dipped galvanized fasteners complying with ASTM A153 and connectors complying with ASTM A653, Class G185; Type 304 or Type 316 stainless steel fasteners and connectors shall be used with new generation of pressure-treated wood; except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. Fasteners shall be self-clinching type of penetrating type as recommended by the manufacturer of the wood blocking/nailer material. Nails and fasteners shall be flush-driven through flat metal discs of not less than one (1) inch diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than one (1) inch diameter are used.
 - 2. Fastening shall conform to ANSI/SPRI ES-1 and/or Factory Mutual 1-90 requirements or as stated on section details, whichever is more stringent and per the manufacturer's requirements.
- I. Metal Termination Bars:
 - 1. Shall be heavy flat bar aluminum unless otherwise recommended by membrane manufacturers.
 - 2. Material shall be .125" x 1" (minimum) aluminum conforming to ASTM B-221, mill finish. Bars shall have holes for fasteners at 6" o.c. maximum.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Isolate contact areas of dissimilar metals with heavy asphalt or other approved coating, specifically made to stop electrolytic action.

3.2 GENERAL

- A. Install work watertight, without waves, warps, buckles, fastening stress, or distortion, allowing for expansion and contraction.
- B. Fastening of metal to walls and wood blocking shall comply with ANSI-SPRI ES-1, SMACNA Architectural Sheet Metal Manual, Factory Mutual 1-90 wind uplift specifications and/or manufacturer's recommendations whichever is of the highest standard.
- C. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.
- D. Pre-manufactured metal edge fascia system's continuous cant dam shall be secured to the top and side of the wood blocking or wall.

- E. Metal fascia extenders shall be secured to wall or wood blocking at the bottom edge with a continuous cleat. Cleats shall be at least one gauge heavier than the metal it secures. Both pieces shall be secured at 6" on center.

3.3 INSPECTION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets are in place, and nailing strips located.
- B. Verify membrane termination and base flashings are in place, sealed, and secure.
- C. Beginning of installation means acceptance of existing conditions.
- D. Field measure site conditions prior to fabricating work.

3.4 SHOP FABRICATED SHEET METAL

- A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.
- B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.
- C. Hem exposed edges.
- D. Angle bottom edges of exposed vertical surfaces to form drip.
- E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.
- F. Joints for pre-manufactured metal edge fascia system, and metal edge fascia extenders shall be formed with a 3/8" opening between sections. The joints of the metal edge fascia system and the metal edge fascia extenders shall be offset a minimum of twelve (12) inches. The joint openings shall be backed by an internal drainage plate formed to the profile of fascia piece. The pre-manufactured metal edge fascia system and metal fascia extenders shall be embedded in two rows of butyl sealant over the internal drainage plate. The internal drainage plate shall be embedded in two rows of butyl sealant over the continuous cant dam and fastened through the opening between the sections and loose locked to the drip edges.
- G. Joints for counterflashings shall be overlapped a minimum of 3", and counterflashings shall extend 4" below the roof flashing termination bar.
- H. Install sheet metal to comply with ANSI/SPRI, SMACNA and NRCA standards, and per the manufacturer's instructions.

END OF SECTION 07600

ANSI/SPRI ES-1 COPING PRELIMINARY DESIGN

Project Name: **Chelsesa ELC, Chelsea, MA**
Roof/Wall Location: **Low Slope Roof**
Sales Representative: **Brendan Wall**

Date: **3/2/2016**

Project Data

Design Wind Speed: 105 mph
Metal Edge Height: 45.00 feet
Exposure Category: B
Importance Classification: III

Design Wind Pressure

Basic Velocity Pressure: 25.53 psf
Horizontal Design Pressure: 22.98 psf

ES-1 Tested Coping System

Product Designation: ES-C040-20-60-16
System Description: R-Mer Edge Coping 16" x .040" Alum. w/ 20 GA Anchor Chairs at 60" o.c.
Maximum Tested Front Load: 54.8 pounds per linear foot
Max. Vertical Front Dim.: 6 inches
Maximum Tested Top Load: 120 pounds per linear foot
Max. Vertical Width: 16 inches
Maximum Tested Rear Load: 47 pounds per linear foot
Max. Vertical Rear Dim.: 4 inches

ANSI/SPRI ES-1 FASCIA PRELIMINARY DESIGN

Project Name: **Chelsea ELC, Chelsea, MA**
Roof/Wall Location: **Low Slope Roof**
Sales Representative: **Brendan Wall**

Date: **3/2/2016**

Project Data

Design Wind Speed: 105 mph
Metal Edge Height: 45.00 feet
Exposure Category: B
Importance Classification: III

Design Wind Pressure

Basic Velocity Pressure: 25.53 psf
Horizontal Design Pressure: 22.98 psf

ES-1 Fascia Load

Vertical Face Dimension: 9.5 max inches
Fascia Design Load: 36.77 pounds per linear foot

ES-1 Tested Fascia System

Product Designation: ES-F950-040-22
System Description: R-Mer Edge Snap Down Fascia 9.5" x .040" Alum. w/ 22 GA Cant Dam
Maximum Tested Load: 130 pounds per linear foot
Max. Vertical Face Dim.: 9.50 inches



The Garland Company, Inc.
Low Slope Roofing Wind Uplift Calculations
3800 East 91st Street
Cleveland, Ohio 44105-2197
Phone: (800) 321-9336 Fax (216) 883-2046

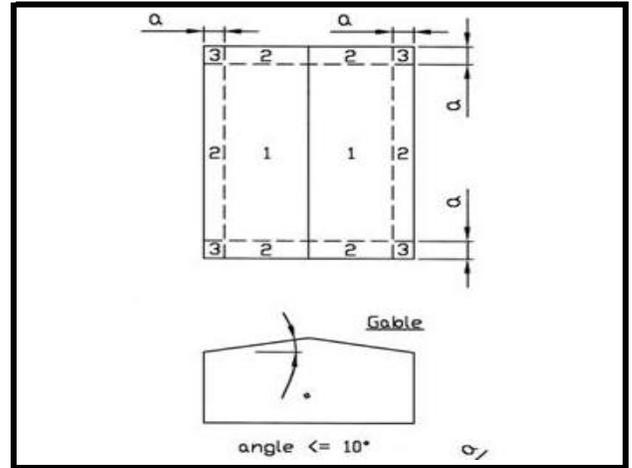
Project **Chelsea ELC**
 Roof **School Roof**
 Sales Rep. **Brendan Wall**

Location **Chelsea, MA**

Zone 1 psf 25.6	Zone 2 psf 43.0	Zone 3 psf 64.7
(mid roof)	(eaves, ridge, hip)	(corners)

Edge Zone Width "a" 5 ft. 0 in.

Fastener Safety Factor	<u>4.00</u>
Importance	<u>III</u>
Importance Factor	<u>1.15</u>
Wind Speed (mph)	<u>105</u>
Ultimate Pullout Value	<u>364</u>
Exposure Category	<u>B</u>
Design Roof Height	<u>45.00</u>
Minimum Building Width	<u>50.00</u>
Roof Pitch (X, Y) 0.5 :	<u>12</u>



System Type: Modified Bitumen

System Type: 2 Ply Modified Bitumen Cold Mech/ Fasten

Surfacing: Mineral Surface

Attachment Method: Insul/Board

Zone 1	Zone 2	Zone 3
(mid roof)	(eaves, ridge, hip)	(corners)
<u>12</u> fasteners per 4' x 8' board	<u>18</u> fasteners per 4' x 8' board	<u>24</u> fasteners per 4' x 8' board

NOTES: Please note that the insulation adhesive was assumed to be Insul-Lock HR applied in 1/2" wide continuous ribbons spaced 12" o.c. per the attached diagram.

EDGE SECUREMENT: Edge metal system must be ANSI/SPRI ES-1 compliant, as required by section 1504.5 of International Building Code. Edge metal system may be an ANSI/SPRI ES-1 compliant premanufactured system, or formed by a contractor certified to fabricate an ANSI/SPRI ES-1 compliant system.

ASCE 7-05 (American Society for Civil Engineers); if a specific building code is required, please specify.

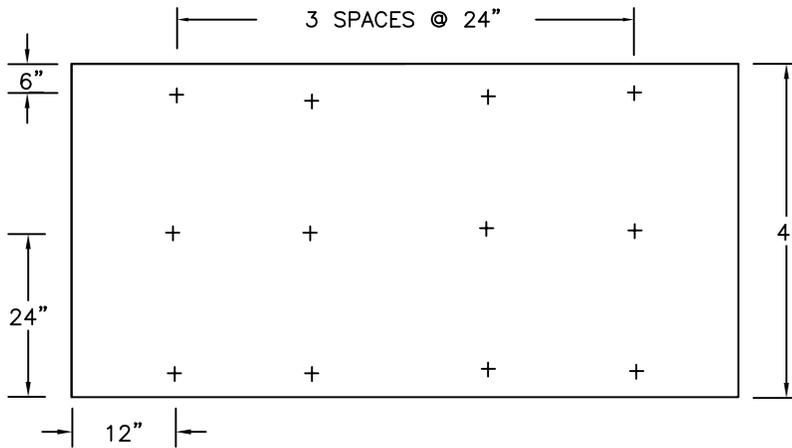
*It is recommended to include the "Negative Uplift Pressures" in the specifications as well as the Safety Factor, Importance Factor, Building Category, Wind Speed, Ultimate Pullout Value, and Exposure.

*The Wind Speed is determined based upon geographical location.

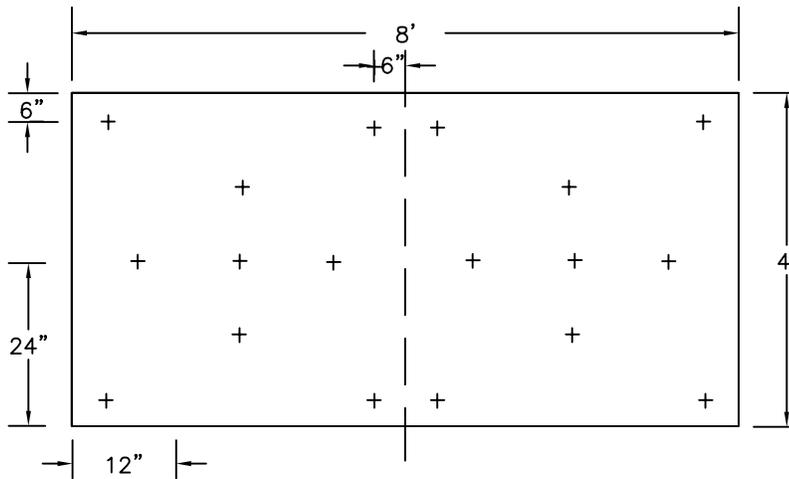
*The Exposure and Importance Factors are needed to determine the uplift pressures.

If you have any questions, please call 800-321-9336 or respond to engineering@garlandind.com

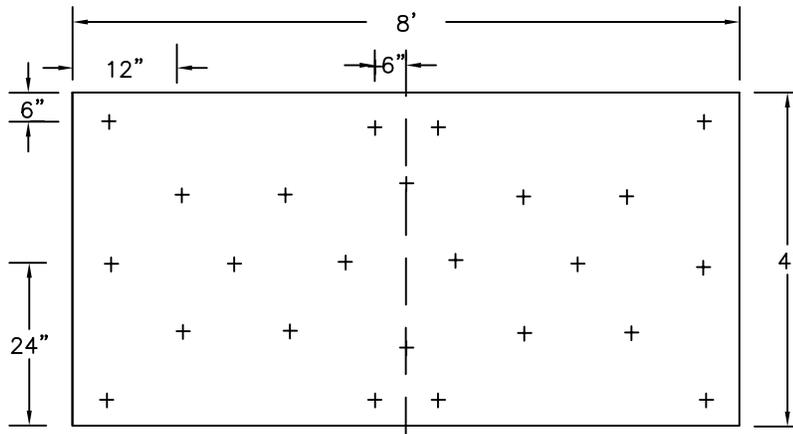
ZONE 1 INSULATION BOARD FASTENER PATTERN: 12 FASTENERS PER BOARD



ZONE 2 INSULATION BOARD FASTENER PATTERN: 18 FASTENERS PER BOARD



ZONE 3 INSULATION BOARD FASTENER PATTERN: 24 FASTENERS PER BOARD



THE GARLAND COMPANY, INC.

3800 EAST 91st STREET
 CLEVELAND, OHIO 44105-2197
 -PHONE 1-800-321-9336-
 FAX 1-216-641-0633

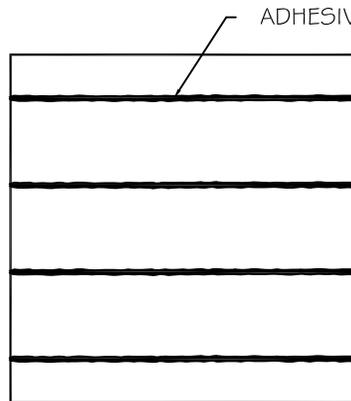
DETAIL:

4 X 8 BOARD PATTERN

SECTION:

INSULATION BOARD FASTENER PATTERN

TYPICAL ZONE 1, 2 AND 3 INSULATION BOARD ADHESIVE PATTERN: 12" OC BEADS PER BOARD



ADHESIVE RIBBON ENLARGED FOR CLARITY

4 ADHESIVE RIBBONS
EQUALLY SPACED AT
12" (30.5cm) O.C. (TYP.)



THE GARLAND COMPANY, INC.
GARLAND CANADA, INC.
THE GARLAND COMPANY UK, LTD

DETAIL:

4 X 4 BOARD PATTERN

SECTION:

INSULATION BOARD ADHESIVE PATTERN

The Garland Company, Inc.
3800 East 91st Street
Cleveland, Ohio 44105-2197
Phone: (800) 321-9336 Fax (216) 883-2046



PROJECT	Chelsea ELC
ROOF SECTION	School Roof
DATE	3/2/2016
BASIC VELOCITY PRESSURE	21.70 psf
DESIGN CODE	ASCE 7-05

System & Attachment Data

Building & Site Data

SYSTEM TYPE	Modified Bitumen
SYSTEM SCOPE	2 Ply Modified Bitumen Cold
SURFACING	Mineral Surface
ATTACHMENT METHOD	Mech/ Fasten Insul/Board
SUBSTRATE MATERIAL	Wood
SUBSTRATE THICKNESS	1/2 in
FASTENER TYPE	Wood: OMG Standard
FASTENER SAFETY FACTOR	4
ULTIMATE FASTENER PULLOUT	364 lbs/screw
ALLOWABLE FASTENER PULLOUT	91 lbs/clip

BASIC WIND SPEED	105	mph
EXPOSURE CATEGORY	B	
TOPOGRAPHY FACTOR	1.00	
BUILDING TYPE	Enclosed	
ROOF PITCH (X, Y)	0.5	12
RUN TO RIDGE	25	
EAVE HEIGHT	45	
DESIGN ROOF HEIGHT	45.00	ft
IMPORTANCE CLASS / FACTOR	III	1.15
MIN. BLDG WIDTH	50	ft
WIND-BORNE DEBRIS REGION	No	
PARAPET	No	
ROOF ANGLE	2.39	deg
PROTECTED OPENINGS	Yes	
ROOF TYPE	Gable	

	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5		
ROOF PRESSURE (psf)	25.6	43.0	64.7	25.4	31.3		
OVERHANG PRESSURE (psf)	36.89	36.89	60.77				
EDGE ZONE WIDTH "a" =	5.00 ft						

DRAFT, rev.

8/1/14

Shrutleff School, Chelsea, MA

EDPM Roof Problem

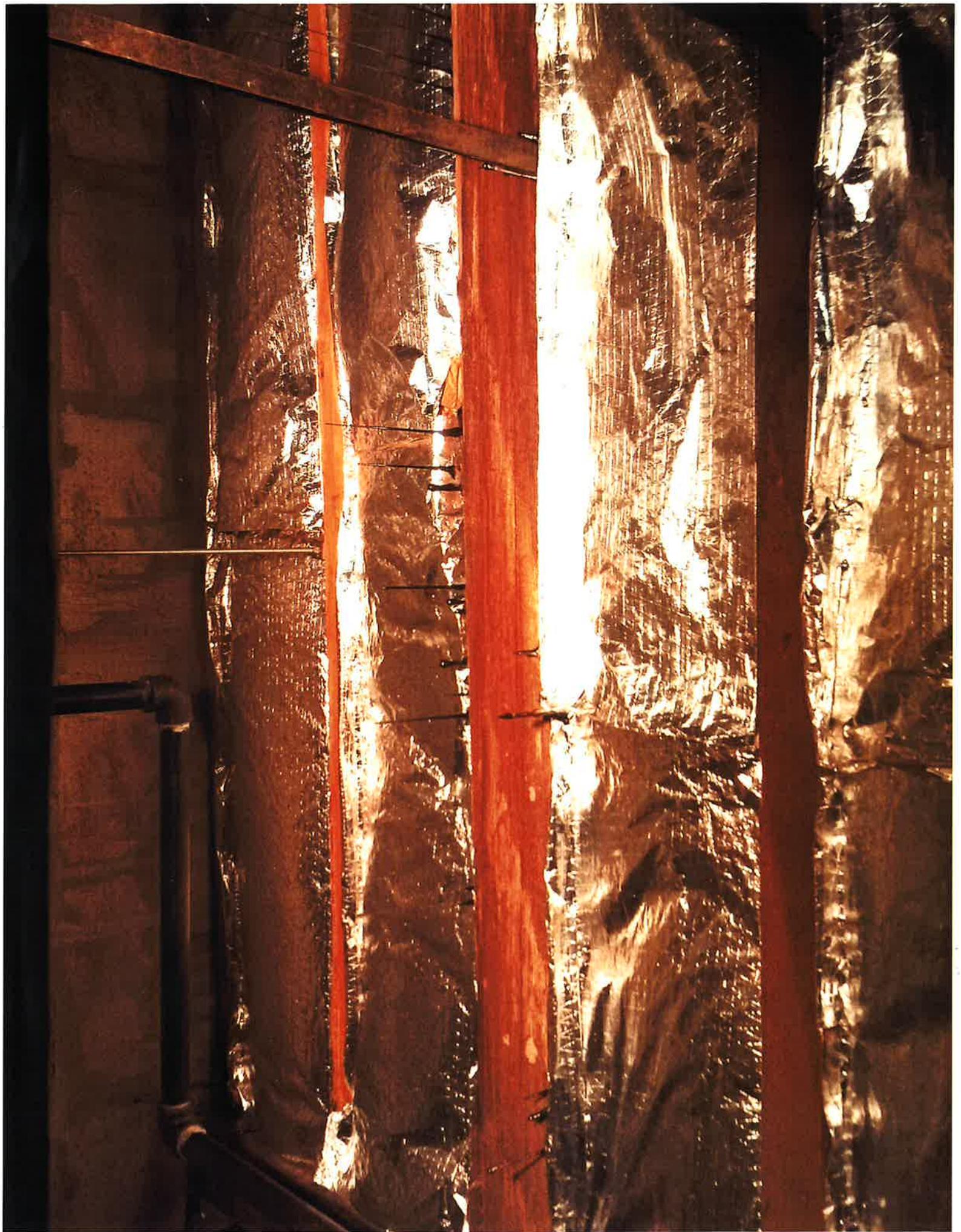
- Problem:** Dropping of asphaltic material through roof deck on to ceiling tiles and the presence of an asphaltic order which may be considered potentially hazardous.
- Roof Assembly:** 18 year old EDPM roof on protection board over existing older roofing on top of wood board decking on wood rafters with fiberglass bat insulation stapled to the underside of the deck (verified visually and from architectural documents).
- Assumed existing older roof: Built up asphaltic roof the on the wood roof deck, a historically common roofing material.
- Probable Conditions:** Under a black roof membrane the temperature in the Northeast is recorded to have risen to over 177 degrees. Asphalt will liquefy between 155 and 178 degrees. The black surface of the EDPM roof absorbs and traps the sun's the heat causing the temperature buildup which causes the asphalt to flow and seep through the wood decking onto the top of the insulation and then run thru the stapled seam between the rafters and the insulation onto the top of the acoustical tile. Particularly In its liquid form asphalt will off- gas a noted order which include various volatile and potentially hazardous compounds.
- Recommendation:** Small sections of the fiberglass insulation should be removed in various locations to ascertain the degree of asphalt below the deck on top of the insulation which has not seeped out along the edges, both in areas where asphalt has been found and in other random locations. Hopefully this survey will aid in determining the scope of the problem and in determining the most appropriate course of action.
- Possible Solutions:** 1. Full removal of the EDPM membrane, the old built-up roofing and the fiberglass insulation and the replacement with above deck rigid insulation and a new white PVC membrane roof. Although the cost is significant, the full removal of the potential hazard is clearly the safest response. Further, this solution should provide some noted energy savings and reduce the impact of continued leaks. Further, the roof membrane is approaching the limit of its normal life. A rough

343 Congress Street
Boston, MA 02210
1.617.242.9222 Fax 1.617.242.9824

budget cost for this work depending on materials and details is estimated at \$10.00-\$15.00/sq. ft.

2. An alternative solution is to prime and coat the existing membrane with a white elastomeric film after the repair of various reported leaks. Such a coating is reported to lower the temperature under a black EDPM membrane up to about 80 degrees. Which should lower the temperature of the built up roof asphalt below the liquid state. This solution should last well into the remaining life of the existing membrane. This could be done over the entire roof or only in the areas where a problem has occurred. The addition of this coating will not eliminate the possible asphalt assumed trapped above the fiberglass insulation stapled to the roof rafters below the roof deck. However, if the entrapped asphalt is limited and is kept at a cool enough temperature it should remain as a solid. It is believed that with the white coating the off-gassing of this asphalt will either not occur or be significantly reduced. A rough budget cost for this work, not including the cost repair the various reported leaks is estimated at: \$3.50-\$4.00/ sq. ft.





July 23, 2014

Mr. Pete Kambour
Director of Facilities Management
Chelsea Public Schools
500 Broadway, Chelsea, MA 02150

Email: kambourp@chelseaschools.com

RE: Preliminary Scope of Work – Indoor Air Assessment - Final
99 Hawthorne Street, Chelsea, MA
Early Learning Center

Dear Mr. Kambour:

EBI Consulting (dba EBI Consulting, hereinafter “EBI”) is pleased to present the following indoor air assessment report prepared in accordance with our June 9, 2014 proposal. On July 8, 2014, EBI personnel conducted a visual inspection, completed an indoor air screening assessment and collected a sample of the material in question. EBI was accompanied by Rory Holleran. The relative concerns were in regards to indoor air quality in room 407.

I. INDOOR AIR SCREENING / VISUAL INSPECTION

EBI conducted the air screening on July 8, 2014. EBI utilized a ppbREA field screening instrument to measure indoor air to a level of parts per billion. The results are compared to 2007 (National Institute for Occupational Safety & Health) NIOSH recommended exposure limits (REL) for asphalt fumes of 5 mg/m³ (ppm) for 15-minute or 5,000 ppb per 15-minutes. The screening levels are reported in **Table I**.

Table I
Indoor Air Screening

Location	Screening (ppb)	Picture #
Hallway forth floor	250	
Entrance Room 405	242	
Hallway directly outside Room 407	271	
Entrance Room 407	253	1
Sink Room 407	231	4
Cleaning supplies below sink Room 407	254	
Paint supplies Room 407	254	5
Bathroom Room 407	245	
Air exhaust Room 407	221	
Return to heat pump	205	
Printer / desk area Room 407	224	6
Supplies Room 407	383	
Supply closet Room 407a	256	
Stain of floor Room 407 (sampled)	2,183	7 & 8
Outside Air	369	9
Above drop ceiling Room 407	1,462	10, 11 & 12
Entrance Room 408	253	
Entrance Room 405	303	
Return Hallway outside Room 407	235	
Entrance Room 407	813	
Ceiling Room 407	712	10, 11 & 12

The background concentration in the fourth floor hallway is 250 ppb. On average, the screening results are consistent with background readings. Elevated measurements were identified in the space above the ceiling of Room 407. NIOSH identifies a screening level of 5,000 ppb in a 15-minute interval for limited exposure. The levels in the room are well below this level but there are intermittent increases.

EBI took pictures of the rooms and areas in question. Table I identifies the appropriate picture in reference to screening and sampling. EBI noted that tar like filaments were located within the ceiling space of room 407 and 408. EBI did not examine ceiling spaces in other rooms.

2. LABORATORY ANALYTICAL

EBI collected a wipe sample from a floor stain in room 408. The sample was dark black and appeared to have dripped from the ceiling. The sample was screened, see Table I, and a wipe sample was collected. The sample was collected utilizing laboratory prepared wipes and placed into laboratory provided containers. EBI had the following analysis conducted, Volatile Organic Compounds (VOC), Semi-volatile Organic Compounds (SVOC) and Total Petroleum Hydrocarbons (TPH). The results indicate acetone, a component in the wipe, TPH and SVOC compounds typically identified in tar and petroleum compounds. The results are tabulated in Table 2 and the full laboratory report is attached. There are no Reportable Concentrations within the Massachusetts Department of Environmental Protection (MassDEP) for the wipe samples however, it is clear that impacts are present and ongoing.

3. RECOMMENDATIONS

EBI recommends that the tar filaments be removed from the ceiling space and impacted ceiling tiles be replaced. Additionally, it is recommended that the source of the tar be inspected, removed, replaced or repaired as deemed appropriate by an engineer or suitable entity knowledgeable in roofing and roofing material construction.

EBI appreciates the opportunity to assist you in this project. Please feel free to call with any questions.

Respectfully submitted,

EBI CONSULTING



Edward F. Giordano, LSP
Sr. Project Manager

ATTACHMENTS

SITE PICTURES

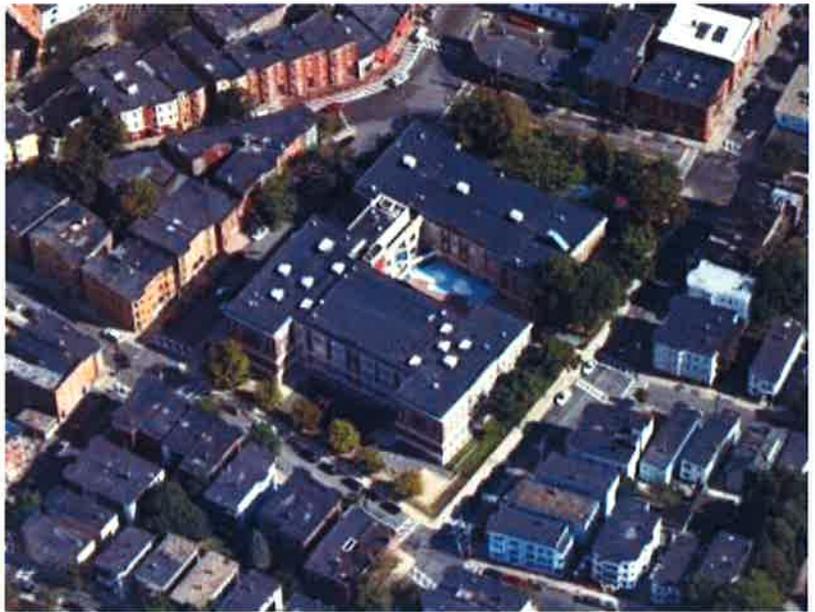
LABORATORY REPORT AND TABULATED DATA

Annual Building Envelope Inspections Report

Shurtleff School

99 Hawthorne Street

Chelsea, MA



Prepared for

City of Chelsea School Department

July 26, 2014

Prepared by

JACOBS
343 Congress Street
Boston, MA 02210

Table of Contents

1. INTRODUCTION
2. BUILDING ENVELOPE
3. MECHANICAL SYSTEMS
4. USE AND RELIANCE RESTRICTIONS

Primary Use		Early Childhood Learning Center		
Site Contact/Property Management		Peter Kambour, Chelsea Schools Department facilities director, Rory Halloran – HVAC technician. Sr. custodian		
Gross Site Area		Unknown		
Zoning		School building (institutional)		
Flood Plain		Unknown		
On-Site Parking Spaces		n/a		
No. of Buildings		1 main building		
	Year Built	Approx Floor Plate SF.	Stories	Construction
Shurtleff School	Est. 1996 (new annex wing)	Unknown	4	Foundation: masonry Façade: brick Framing System: n/a Roof: EPDM fully adhered and mechanically fastened.

1. Introduction:

1.1 Purpose

The purpose of this report is to assist the Client in identifying defects as part of an on call “house doctor services” agreement. The purpose of this site visit was to conduct an annual building envelope assessment and identify items requiring maintenance or upgrade.

- Identify significant defects, deficiencies, items of deferred maintenance and material building code violations (individually and collectively, physical deficiencies) based upon a visual survey of the site, review of documents, and research and interrogatories as described herein.

- Documents the site's overall physical condition, describes pertinent components or systems, and identifies physical deficiencies and conditions that may limit the expected useful life of major components or systems.

1.2 Scope

This report is an opinion about the condition of this school. It is based on visual evidence available during our inspection of all reasonably accessible areas. We did not remove any surface materials, perform any destructive testing, nor move any furnishings. This study is not an exhaustive technical evaluation. Such an evaluation would entail a significantly larger scope of work than this effort.

1.3 Research (Documentation and Personnel)

As an integral part of this evaluation, Peter Kambour of Chelsea schools and Rory Halloran the HVAC maintenance technician provided certain information for the purpose of furthering our understanding of the site, and, as appropriate, supporting the findings presented in the report.

Jacobs was provided entry to all reasonably accessible areas of the site. We inspected the roofs of the three major building volumes making up the Shurtleff Early Learning Center complex as well as various interior spaces. Jacobs also conducted a walk around inspection of the exterior of the buildings.

We do not render an opinion on portions of the site that we did not inspect. A sampling of the school, consisting of all accessible spaces available to Jacobs, was conducted within the building. Jacobs did not perform any intrusive testing behind walls, above ceilings or on the roof. Our inspection was performed by visually inspecting readily accessible areas to the best extent possible.

Specifically, we reviewed the following documentation:

1.4 Methodology

Jacobs performed professional services, obtained findings, and prepared recommendations according to customary principles and practices in the fields of property condition and engineering inspections.

1.5 Site

Shurtleff Early Learning Center - 99 Hawthorne Street, Chelsea MA, 02150

1.6 General Site Description

The Shurtleff Early Learning Center consists of four levels of classrooms in an urban setting – The School consists of 2 original school buildings, connected by an annex wing that connects the two schools together into one single building. The annex building was built in 1996 and

constructed of exterior masonry, metal wall panels, and storefront system. Major masonry wall restoration project was done on the two original buildings within 12 months from this site visit.

1.7 Age of Building

The original buildings were constructed circa 1909 and new annex building circa 1996 making their effective ages 18 years old. (In 1996 as part of a citywide school building plan a new school located on Everett street was opened).

1.8 Evidence of Compliance

All areas reviewed indicate that the building is in code compliance.

2. Building Envelope:

2.1 Roofing

Concurrent to this report, Chelsea Public School has planned to replace the roof assembly at the annex building along with the cooling tower replacement project. The school roofs are all low slope insulated fully adhered EPDM (rubber) membrane roof over mechanically fastened insulation. This roof replacement project is slated to start in the fall of 2014. This work is based on observations that the overall condition of the annex building's roof appears to be in poor condition. The membrane is not adhered to the substrate and shows areas of "bubbling."

At the time of visit—July 17th, 2014--it was observed that black bituminous material was emanating from the roof assembly and was leaking onto the concealed side of acoustical ceiling tiles. The material was viscous and was dripping down from the roof structure. In room M404, which is the storage space on the fourth floor, there were black debris found on the floor. All the classrooms adjacent to this storage room were reported to have odor problems. In classroom M407, the ceiling tiles below the general area of black material emanation were removed for visual inspection. The photos below are included as visual evidence.

JACOBS was given access to the roof surface above room M407. The roof surface appears to be in good condition and does not present any visual evidence of problems. The problem is occurring within the roof assembly and further invasive investigations need to be done to achieve with certainty the root cause of the problem.

Given that at the time of visit, the outdoor temperature reached close to 90 degrees Fahrenheit, and the black material was in liquid state, it is most likely that bituminous roofing material trapped within the roof assembly was melting and seeping through the openings in the roof structure.

Deficiency:	Roof material was melting and seeping through the roof structure. Viscous material was collecting on top of concealed surface of acoustical ceiling tiles.
Correction:	Perform invasive investigation into the roof assembly over room M407 and determine corrective action.
Photo(s):	1,2,3,4,5



Photo 1 – note the black debris found on the floor of storage room M404



Photo 2 – note the viscous material collected on ceiling



Photo 3 – note the black material spilling onto steel members



Photo 4 – note the black material spilling onto steel members



Photo 5 – roof over room M407,M404, note that there is no problem evident from the roof surface.

2.2 Façade

In general the exterior walls of the school complex are masonry and appear to be in good to fair condition; our observations did find caulking failures at the metal panel façades, this was noted at the metal panel system directly above the main entrance on the east side courtyard--the blue bay window. Caulking in these areas was noted to have failed. The failed caulking results in cracks and fissures and openings that could provide points of water infiltration into the walls and into the building interiors. Jacobs recommends that all areas of failed caulking be removed and replaced with new backer rod and weather resistant caulking as soon as possible. Jacobs shall address this last issue under a separate task order.

Deficiency:	Caulking failures at metal panel system
Correction:	Replace caulking with new. (recommend future corrective action)
Photo(s):	6,7



Photo 6



Photo 7

2.3 Interior Walls / Ceiling

As a result of failure of caulking noted above, water is penetrating through the entire wall assembly and causing deterioration of the interior gypsum partitions that are the finish surfaces of the bay window.

Deficiency:	Wall leaks at all levels 2 and 3 of the annex building bay window
Correction:	Replace interior gypsum boards with new and finish with paint to match. (recommend future corrective action)
Photo(s):	8,9



Photo 8



Photo 9

2.4 Windows

Windows along the exterior appear to be in good to fair condition. It was reported that the windows in classroom A136 were leaking. Corrective measure of re-caulking was done around the window frames prior to date of site visit.



Photo 10

Deficiency:	Isolated case of window leak at classroom A136
Correction:	n/a
Photo(s):	10

2.5 Doors

Exterior doors appeared to be in good working order and free of defects, no action is required.

2.6 Fire/Life Safety

The building has lighted exit signs, battery emergency lighting and portable fire suppression equipment throughout the building, which includes wall-mounted, and column-mounted ABC fire extinguishers.

2.7 ADA Compliance

The building is in compliance with ADA based on our observations.

3. Mechanical Systems:

3.1 Summary

On July,17 2014 Jacobs engineer toured the building for the purpose of evaluating the general condition of the Mechanical systems. A previous building evaluation report and existing drawings were the primary sources of information about the building during the walkthrough.

The building was built in 1996 and consists of four levels of classroom type spaces. It is one mechanical room and equipment on the roof of the building.

The general impression of the mechanical systems is that the equipment and systems have been fairly well maintained over the life of the building also shows evidence of surface rust and corrosion. Cooling Tower on the roof is in poor condition and is in a process of replacement. Heat pumps, boilers and pumps, with a continuing maintenance program, can provide several more years of useful life. Most of the mechanical equipment is original to the building.

There are also few minor issues with some of the systems and equipment that are presented in the individual component descriptions.

3.2 Heating, Ventilation, and Air Conditioning

3.2.1 Cooling and heating plant

The majority of the spaces within the building are heated and cooled by water source heat pumps. Heating system consist of three gas fired "Burnham" cast iron boilers and pumps to provide hot water to the system. Boilers are located in Mechanical room. Cooling system consist of Cooling Tower, located on the roof. Heat pumps are connected to the building condenser/heating water loop. In addition electric unit heaters, baseboards and cabinet heaters provide heat to stairs, lobby and multiple exterior rooms.

Boilers and pumps are original to the building and are approximately 18 years old and have an estimated service life of 20 years. It is possible that the old boilers are a good candidates for an energy upgrade to a gas fired, high efficiency condensing modular boilers. Rebates and incentives may be available through the local utility company



Boilers in Mechanical Room



Dual Water Pumps in Mechanical Room.

3.2.2 Air handling units

Fourteen gas fired “AAON” roof top air handling units located on the roof provide ventilation air to the occupied spaces. The duct system consist of supply and return ducts, supply and return diffusers and grilles

The air handling systems consist of a roof mounted gas fired heating and DX cooling air handling units. The air handling units can provide either heating or cooling on a year round basis.



Roof top air handling unit and exhaust fans.



Cooling tower on roof.

A roof mounted exhaust fans provides ventilation for the toilet rooms, janitor's closets, lobby, staff rooms and class rooms. Although the fans appeared to be operating properly, they are original to the building.

3.3 Energy Rebate Programs

State sponsored energy rebate programs are available for upgrades to HVAC motors, unitary cooling equipment and building controls.

See <http://energy.gov/eere/femp/energy-incentive-programs-massachusetts>

It appears that some equipment or motor replacement programs would apply and should be investigated.

4. Use and Reliance Restrictions:

4.1 Restrictions

JACOBS has produced this document under an agreement between JACOBS and Chelsea Schools. All terms and conditions of that agreement are included within this document by reference. JACOBS disclaims any obligation to any other person with respect to any material presented in this document and no person may rely upon this document, with the exception of Chelsea Schools, without advance and express written consent from JACOBS and such person's written agreement to be bound by the limitations, qualifications, terms, conditions, and indemnities to JACOBS set forth in that agreement. JACOBS specifically states that its review of the property in question is subject to monetary restraints and scope limitations. Given those limitations and conditions, JACOBS has made what, in its opinion, is a reasonable investigation limited to visual observations. Design analysis of existing systems, including structural systems, has not been performed. JACOBS has also relied upon interviews and documents with the understanding that independent verification of their factual content is beyond the scope of JACOBS work. The materials presented in this document are "to JACOBS knowledge" where such phrase means to JACOBS actual knowledge of the subject matter after such inquiry as JACOBS considered reasonable in light of the qualifications and limitations upon the scope of work.

Assumptions regarding the overall condition of the property have been developed based upon inspection of "representative" areas of the building. As such, the development of schematic methods and associated costs for the correction of identified deficiencies is based upon the overview inspection and are also limited with respect to completeness.

Investigation for the presence of asbestos containing building materials (ACBM), PCBs, CFCs, radon and other environmentally hazardous materials is not part of The Agreement. In addition, a review and certification that the buildings have been designed to meet current seismic requirements, is not part of this review.

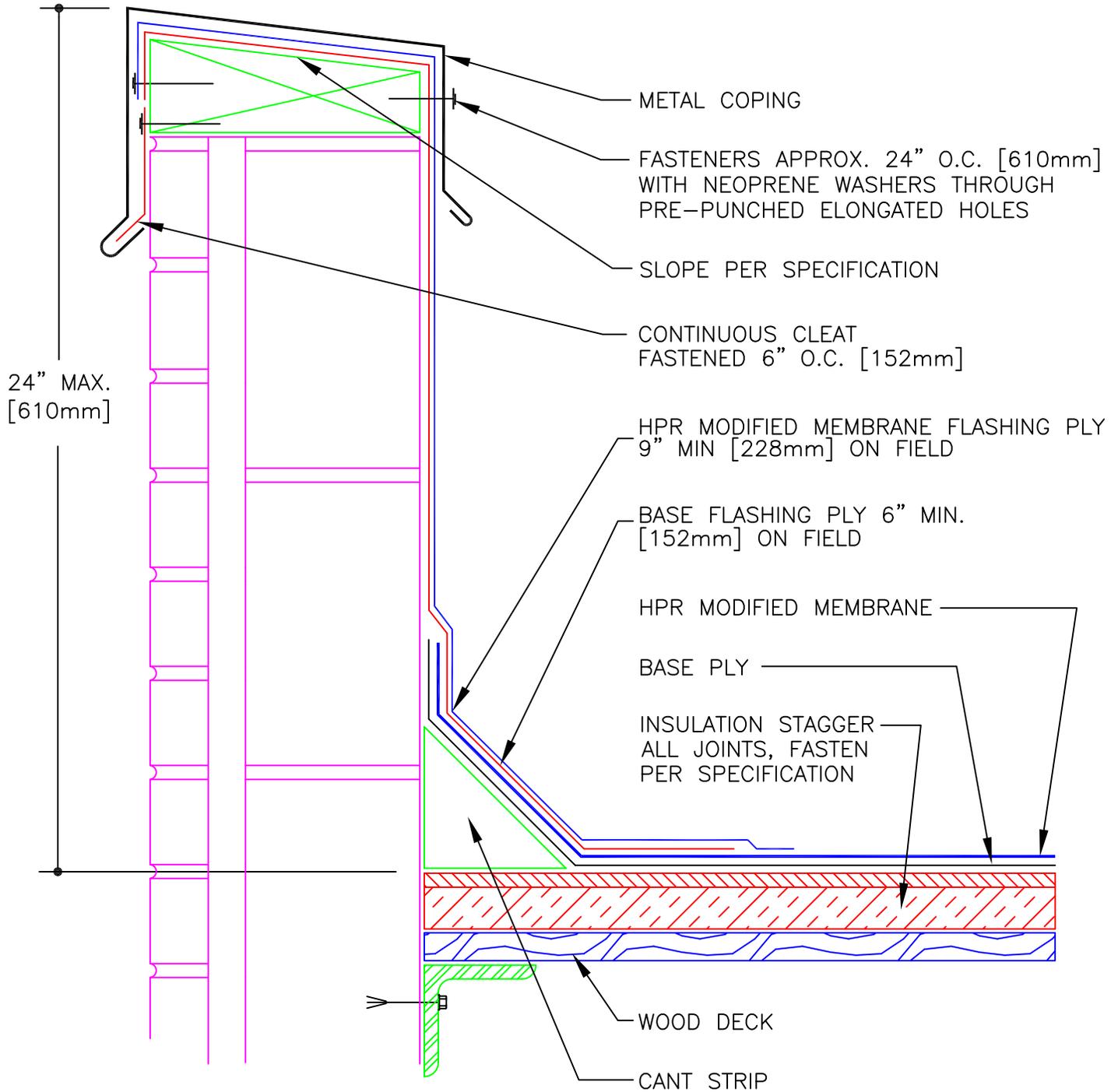
4.2 Resources and Contacts

On-Site Review was conducted on July 17th, 2014 by:

- Valentina Patterson (HVAC Engineer)
- David Choi, AIA (Architect)

4.3 Documents Reviewed

- Interview with Rory Hollaran and Peter Kambour



ALL PLIES SET IN MODIFIED COLD ADHESIVE
SEE SPECIFICATIONS FOR SURFACING

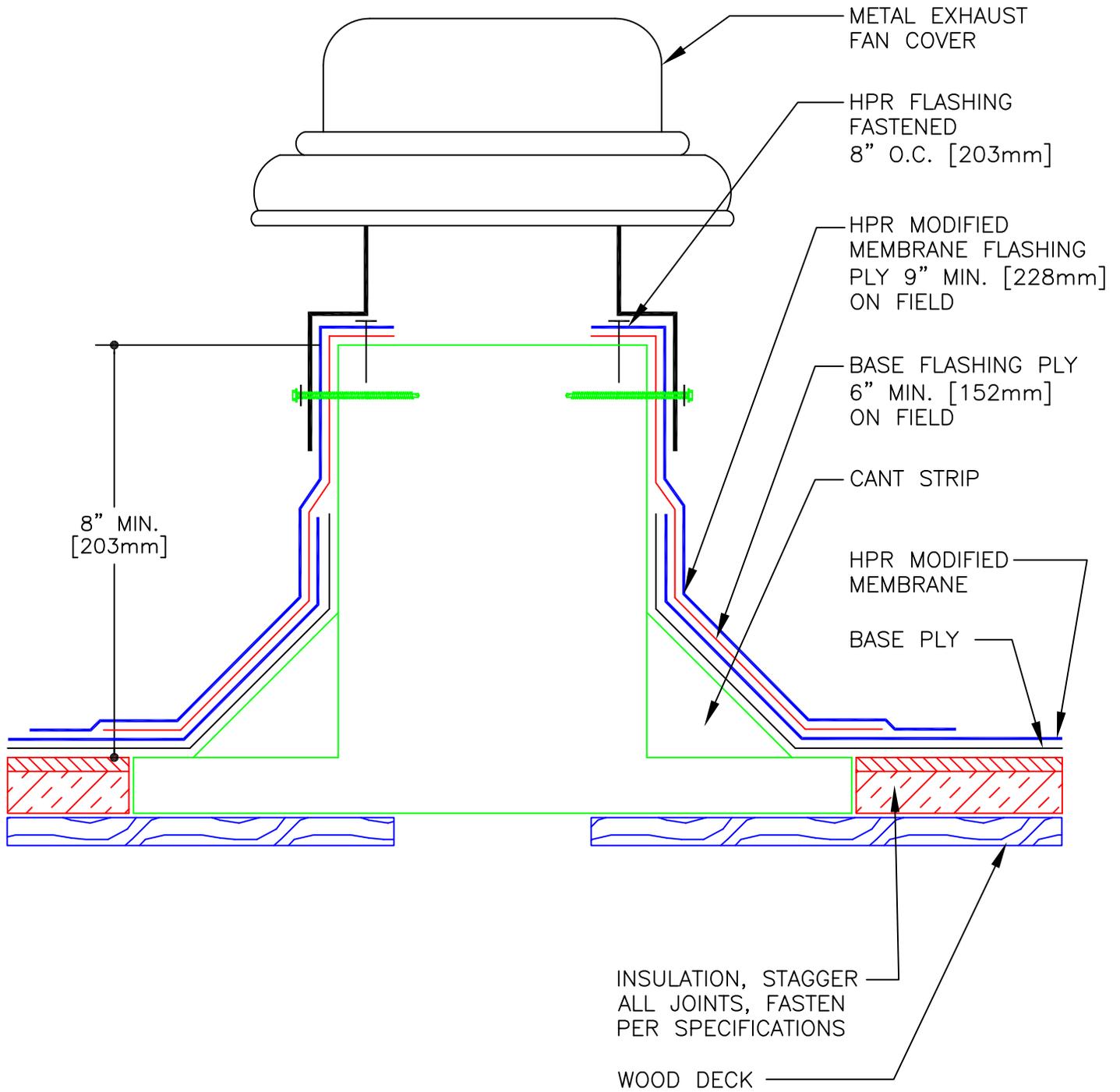


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 GARLAND CANADA, INC.
 THE GARLAND COMPANY UK, LTD

DETAIL:

C O P I N G C A P

2 PLY-COLD APPLIED



ALL PLYS SET IN MODIFIED COLD ADHESIVE
SEE SPECIFICATIONS FOR SURFACING

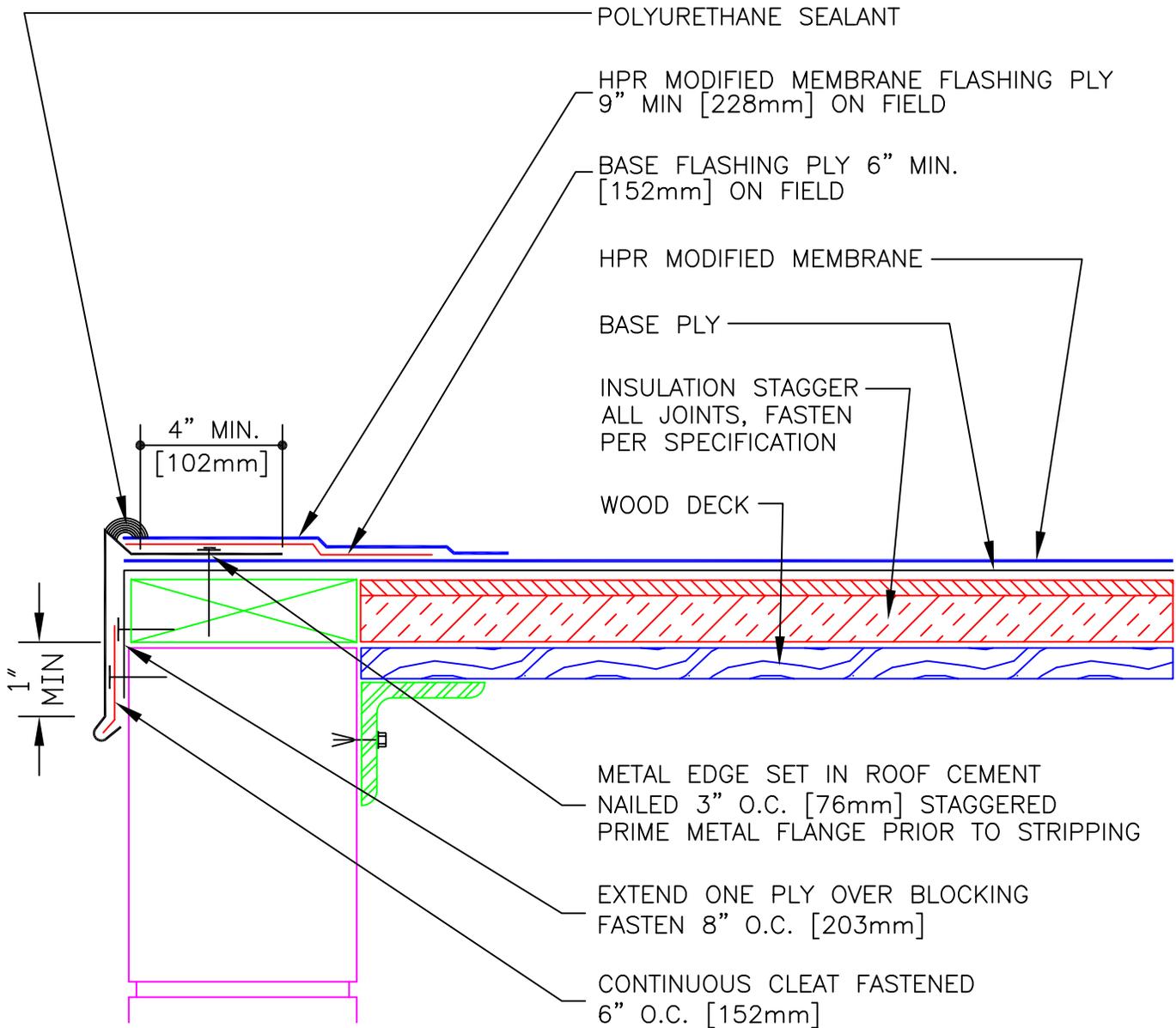


THE GARLAND COMPANY, INC.
 GARLAND CANADA, INC.
 THE GARLAND COMPANY UK, LTD

DETAIL:

EXHAUST FAN DETAIL

2 PLY-COLD APPLIED



ALL PLIES SET IN MODIFIED COLD ADHESIVE SEE SPECIFICATIONS FOR SURFACING

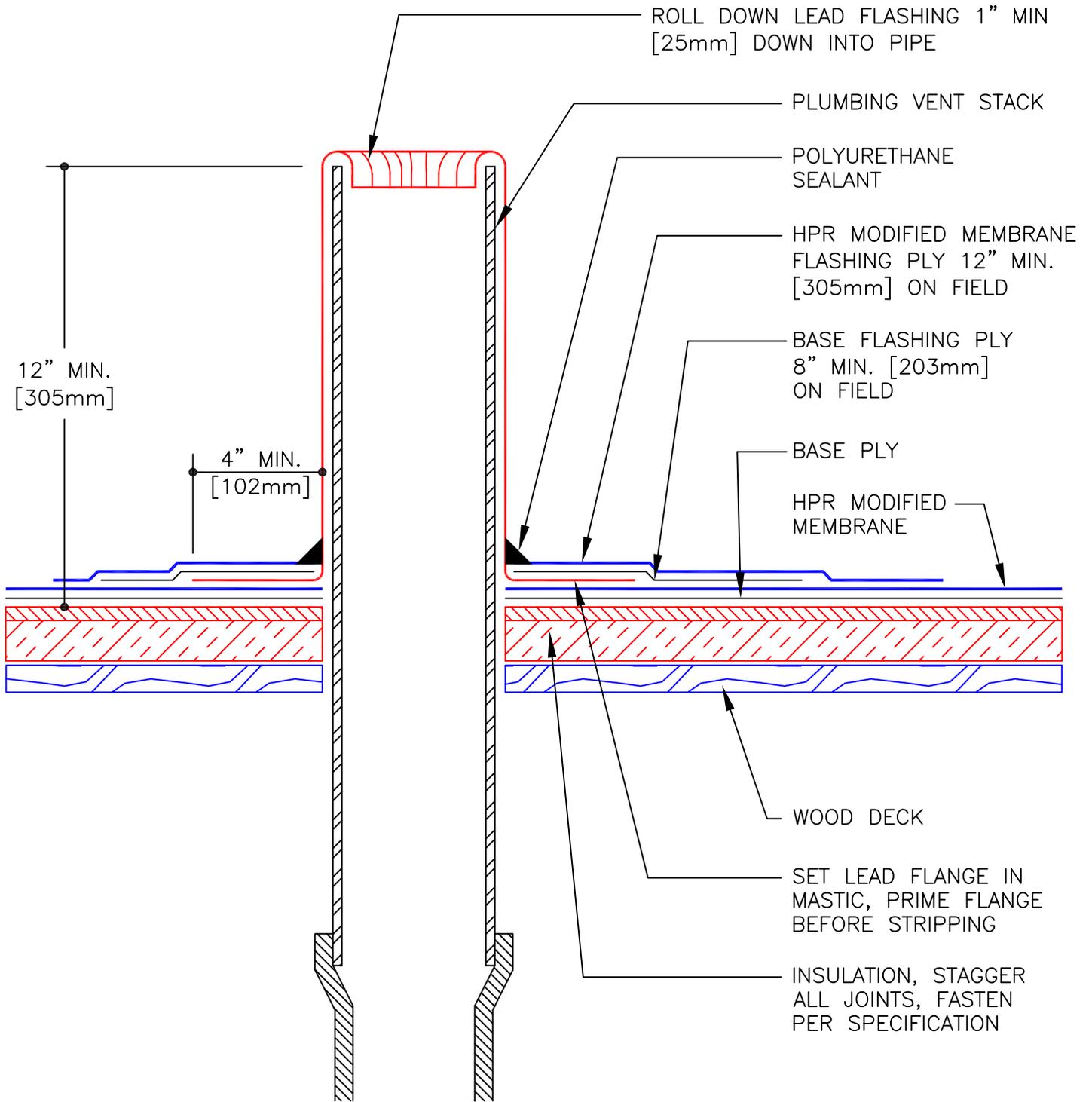


THE GARLAND COMPANY, INC.
 GARLAND CANADA, INC.
 THE GARLAND COMPANY UK, LTD

DETAIL:

METAL ROOF EDGE

2 PLY-COLD APPLIED



ALL PLYS SET IN MODIFIED COLD ADHESIVE
SEE SPECIFICATIONS FOR SURFACING

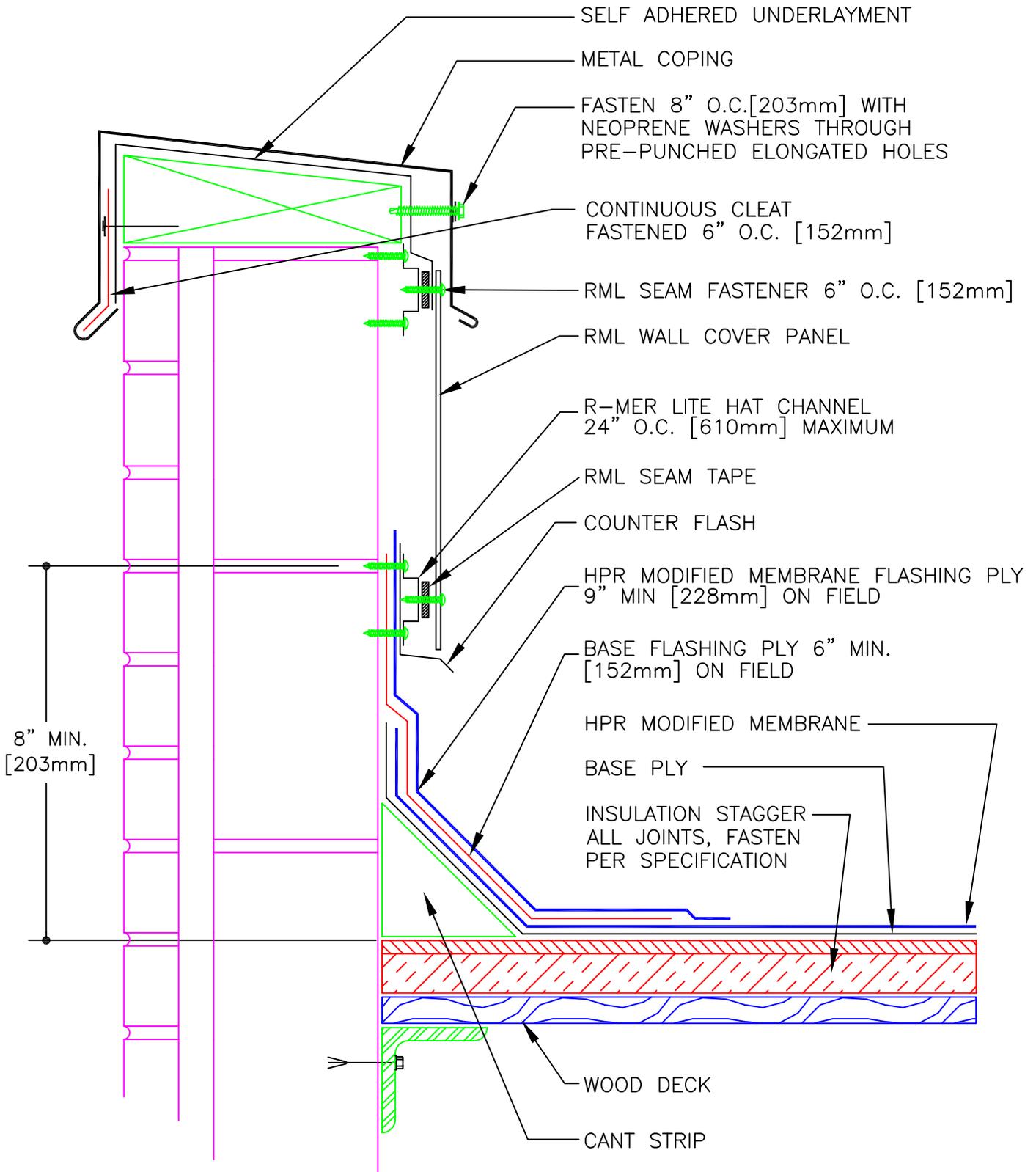


THE GARLAND COMPANY, INC.
GARLAND CANADA, INC.
THE GARLAND COMPANY UK, LTD

DETAIL:

PLUMBING STACK

2 PLY-COLD APPLIED



ALL PLYS SET IN MODIFIED COLD ADHESIVE
SEE SPECIFICATIONS FOR SURFACING

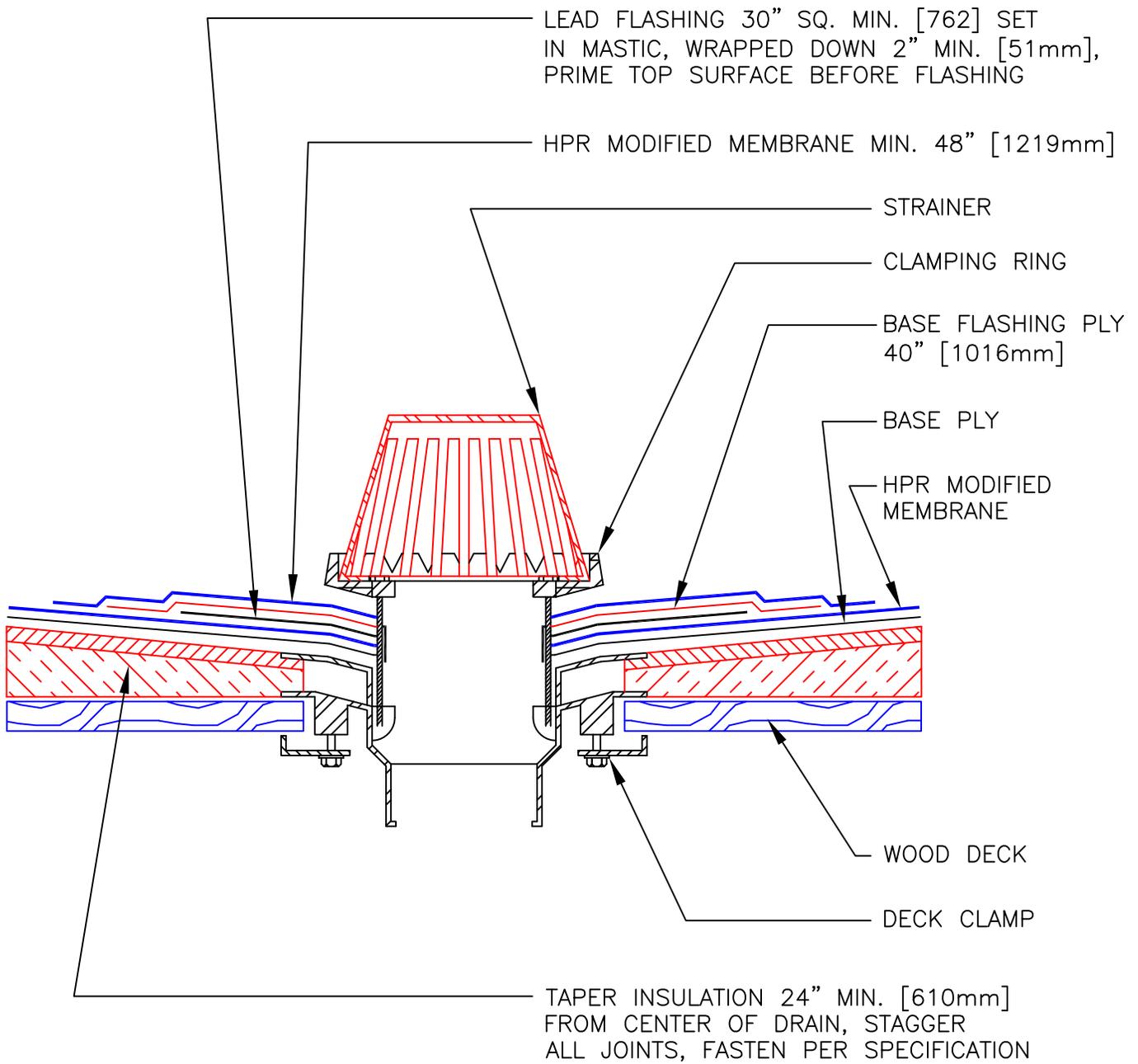


THE GARLAND COMPANY, INC.
GARLAND CANADA, INC.
THE GARLAND COMPANY UK, LTD

DETAIL:

RML WALL PANEL W. MOD. BITUMEN ROOF FLASHING

2 PLY-COLD APPLIED



ALL PLIES SET IN MODIFIED COLD ADHESIVE
SEE SPECIFICATIONS FOR SURFACING



THE GARLAND COMPANY, INC.
GARLAND CANADA, INC.
THE GARLAND COMPANY UK, LTD

DETAIL:

ROOF DRAIN

2 PLY-COLD APPLIED



April 27, 2016

David Choi
Jacobs Engineering
343 Congress Street
Boston, MA 02210

Re: **Hazardous Materials Roof Survey**
John Silber Early Learning Center
99 Hawthorne Street
Chelsea, Massachusetts
Nover-Armstrong Project No. P4012

Dear Mr. Choi,

Nover-Armstrong Associates, Inc. (Nover-Armstrong) has completed a Hazardous Materials Roof Survey for the John Silber Early Learning Center property referenced as 99 Hawthorne Street in Chelsea, Massachusetts (the site). Refer to Attachment A, Figure 1 – Site Location Map. Nover-Armstrong understands that portions of the site structure’s roof may be replaced in the future. Nover-Armstrong’s survey was limited to these portions of the roof, as directed by City of Chelsea personnel. Cutting / coring and patching of roofing materials was performed by a separate roofing contractor hired by the City of Chelsea.

1.0 Asbestos Containing Materials (ACMs)

A survey was conducted to identify ACMs associated with the site structure’s roof on April 14, 2016. The survey was conducted in accordance with Massachusetts Department of Labor and Workforce Development (DLWD) – The Removal, Containment and Encapsulation of Asbestos Regulations – 453 CMR 6.00 and other applicable federal asbestos regulations. The survey was conducted by Matthew Alger, who is certified as an Asbestos Inspector pursuant to Title II of the Toxic Substance Control Act (TSCA), 15, U.S.C. 2646. See Attachment F for license / certification details.

The southeastern portion of the site structure’s roof, including main roof areas, parapet areas, and roof-mounted mechanical equipment areas were visually inspected for potential ACMs. Visual inspection revealed roofing materials that were considered to be suspect ACMs. Roofing materials considered suspect of containing asbestos were observed to be in generally fair condition. A roofing contractor hired by the City of Chelsea made four cuts in the existing EPDM rubber membrane roof. The cuts located at

vertical surfaces (parapet walls and base of HVAC equipment) revealed only a fiber board layer beneath the rubber membrane. The roof cut located on the main flat roof area revealed multiple layers of built-up roofing materials that appeared to comprise two separate roof systems. The upper layers of the main roof consisted of: rubber membrane, asphalt shingle, fiber board, and tar. The lower layers of the main roof (older roof system) consisted of paper and coal tar. Black sealant material was located along seams in the rubber throughout the main areas and edges of the roof.

Accessible areas were assessed, inspected and / or sampled. Materials hidden or not accessible were evaluated and / or sampled within reasonable access limitations. Suspect ACMs are classified as friable or non-friable material. Friable material may be crumpled, pulverized or reduced to powder with hand pressure. Friable materials are more hazardous than non-friable materials because they can readily release airborne asbestos fibers.

Bulk samples of suspect materials were collected into sealed plastic bags and delivered to AEC Laboratories, LLC (AEC) of Weymouth, MA. Bulk samples were analyzed by Polarized Light Microscopy (PLM) utilizing dispersion staining (DS) techniques in accordance with EPA Method 600/R-93/116. A total of three multi-layer samples were submitted for analysis. Table 1 (attached) details analytical results. The analytical laboratory report and corresponding chain of custody (COC) forms are included in Attachment D of this report.

As detailed in Table 1, bulk material analytical results did not reveal evidence of ACMs. Please refer to Attachment C for photographic documentation.

Materials hidden or not accessible were evaluated and/or sampled within reasonable access limitations. During future renovation / demolition activities, additional building materials suspect of containing asbestos may be identified. If so, materials should be sampled and analyzed by a certified asbestos inspector prior to disturbance or removal.

2.0 PCBs and Other Potentially Hazardous Materials

On April 14, 2016, selected representative samples of the observed roofing materials were submitted for laboratory analysis of other potentially hazardous materials including: polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and 8 RCRA Metals. The sample containing lower layers of the main roof and the sample containing black sealant materials were submitted for analysis to ESS Laboratories, Inc. (ESS). Table 2 (attached) summarizes contaminant concentrations in milligrams per kilogram (mg/kg).

Concentrations of PCBs were not detected above 1 mg/kg in the samples analyzed; therefore, these materials can be managed as general construction waste with regard to PCBs.

Concentrations of several VOCs, SVOCs, and Metals were detected in the sample containing lower layers (coal tar & paper) of the main roof. These compounds are likely attributable to the coal tar constituents of the roofing materials.

3.0 Conclusions / Recommendations

ACMs

EPA defines an asbestos-containing building material (ACBM) as a building material that contains asbestos in concentrations of 1% or greater. However, MassDEP has amended the Massachusetts Air Pollution Regulations (310 CMR 7.00 and 310 CMR 7.15). The revised regulations took effect on June 20, 2014. In accordance with the new MassDEP asbestos regulations, building materials that contain <1% asbestos are now considered to be an asbestos containing waste material (ACWM). Nover-Armstrong's bulk sampling and analysis of roofing materials did not reveal evidence of ACMs (0% asbestos); therefore, the roofing materials can be disposed of as general construction waste with regard to asbestos.

PCBs

Concentrations of PCBs were not detected above laboratory reporting limits in the roofing material samples analyzed. Materials containing less than 1 mg/kg of PCBs are not regulated and can be disposed of as general construction waste with regard to PCBs. However, some disposal facilities may impose limits on accepting such materials even though the detected concentrations are below TSCA limits.

We appreciate the opportunity to work with Jacobs Engineering on this project. If you have any questions or require additional information, please do not hesitate to contact our office. Thank you.

Sincerely,

Nover-Armstrong Associates, Inc.



Matthew Alger
Project Manager



Marylou Armstrong, LSP
Principal

Attachments:

- A Figures:
 Figure 1 – Site Location Map

- B Tables:
 Table 1 – Summary of 04.2016 ACM Analytical Results
 Table 2 – Summary of 04.2016 Roofing Materials Analytical Results

- C Photographic Documentation

- D AEC Asbestos Analytical Laboratory Report, dated April 22, 2016

- E ESS Analytical Laboratory Report, dated April 25, 2016

- F Asbestos Inspector Certification

Attachment A

Figure 1 – Site Location Map

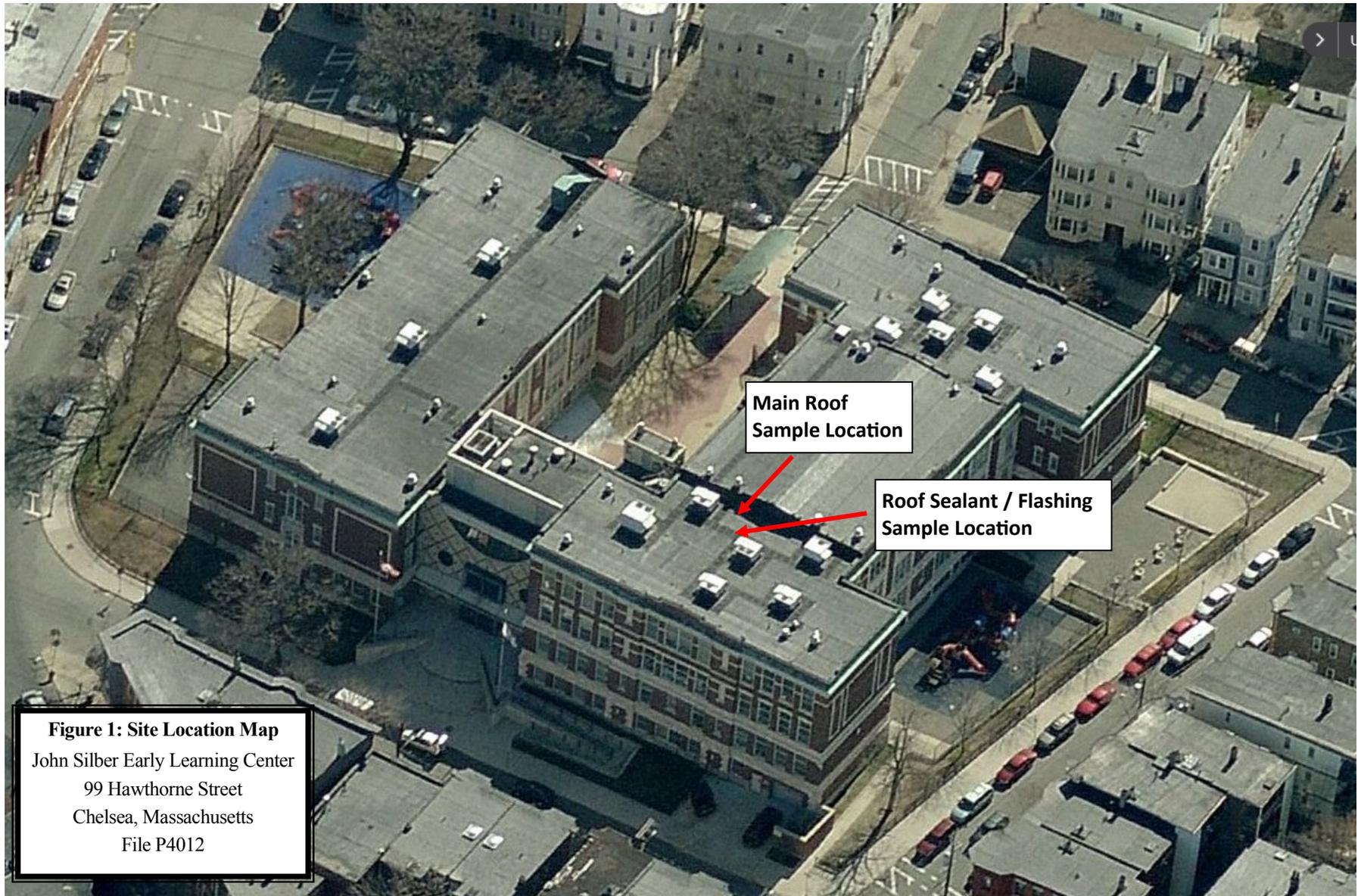


Figure 1: Site Location Map
John Silber Early Learning Center
99 Hawthorne Street
Chelsea, Massachusetts
File P4012



Attachment B

Table 1 – Summary of 04.2016 ACM Analytical Results

Table 2 – Summary of 04.2016 Roofing Materials Analytical Results

TABLE 1 - Summary of 04.2016 ACM Analytical Results

Field ID	Lab ID	Sample Date	Description	Total Asbestos %
Main Roof - Upper Layers	16362-01.1	04.14.16	Black Built Up Roofing (Asphalt Shingle)	NAD
Main Roof - Upper Layers	16362-01.2	04.14.16	Black Built Up Roofing (Tar Layer)	NAD
Main Roof - Upper Layers	16362-01.3	04.14.16	Black Built Up Roofing (Fiber Board)	NAD
Main Roof - Lower Layers	16362-02.1	04.14.16	Black Coal Tar and Paper (Paper)	NAD
Main Roof - Lower Layers	16362-02.2	04.14.16	Black Coal Tar and Paper (Tar Layer)	NAD
Flashing Materials	16362-03.1	04.14.16	Black Sealant and Fiber Board (Black Sealant)	NAD
Flashing Materials	16362-03.2	04.14.16	Black Sealant and Fiber Board (Fiber Board)	NAD

Notes:

NAD - No Asbestos Detected

TABLE 2 - Summary of 04.2016 Roofing Materials Analytical Results

SAMPLE ID	Roof-Bottom Layers	Roof-Sealant
SAMPLING DATE	04/14/2016	04/14/2016
UNITS	mg/kg	mg/kg
PCBs (mg/kg)		
Aroclor 1016	BRL(<0.199)	BRL(<1.43)
Aroclor 1221	BRL(<0.199)	BRL(<1.43)
Aroclor 1232	BRL(<0.199)	BRL(<1.43)
Aroclor 1242	BRL(<0.199)	BRL(<1.43)
Aroclor 1248	BRL(<0.199)	BRL(<1.43)
Aroclor 1254	BRL(<0.199)	BRL(<1.43)
Aroclor 1260	BRL(<0.199)	BRL(<1.43)
Aroclor 1262	BRL(<0.199)	BRL(<1.43)
Aroclor 1268	BRL(<0.199)	BRL(<1.43)
Volatile Organic Compounds (VOC) (mg/kg)		
1,2,4-Trimethylbenzene	4.57	---
1,3,5-Trimethylbenzene	1.83	---
Benzene	2.12	---
Ethylbenzene	0.799	---
Naphthalene	2380	---
n-Butylbenzene	0.537	---
Toluene	3.06	---
Xylene O	1.96	---
Xylene P,M	4.45	---
Xylenes (Total)	6.41	---
VOCs NOS	BRL	---
Semi-Volatile Organic Compounds (SVOC) (mg/kg)		
2-Methylnaphthalene	1410	---
Acenaphthene	1910	---
Acenaphthylene	420	---
Anthracene	4090	---
Benzo(a)anthracene	4850	---
Benzo(a)pyrene	3800	---
Benzo(b)fluoranthene	4710	---
Benzo(g,h,i)perylene	1590	---
Benzo(k)fluoranthene	1540	---
Chrysene	4500	---
Dibenzo(a,h)Anthracene	844	---
Dibenzofuran	2050	---
Fluoranthene	14300	---
Fluorene	3230	---
Indeno(1,2,3-cd)Pyrene	1550	---
Naphthalene	6900	---
Phenanthrene	15700	---
Phenol	388	---
Pyrene	9570	---
SVOCs NOS	BRL	---
Total Metals (mg/kg)		
Arsenic	BRL(<4.63)	---
Barium	15.8	---
Cadmium	BRL(<0.93)	---
Chromium	3.42	---
Lead	21.2	---
Mercury	BRL(<0.032)	---
Selenium	BRL(<9.26)	---
Silver	BRL(<0.93)	---

Notes:

Concentrations presented in mg/kg - milligrams per kilogram - parts per million

BRL - Below laboratory reporting limit

NOS - Not otherwise specified

--- Sample not analyzed for specified compound

Attachment C

Photographic Documentation

Photo 1



Photo depicts the Main Roof Sampling Location (multiple layers).

Photo 2



Photo depicts the roofing materials being collected from the Main Roof.

PHOTOGRAPHIC DOCUMENTATION

99 Hawthorne Street

Chelsea, Massachusetts

Photographs Documented April 14, 2016

Project File P4012

Photo 3



Photo depicts the Roof Sealant / Flashing Sample Location.

Photo 4

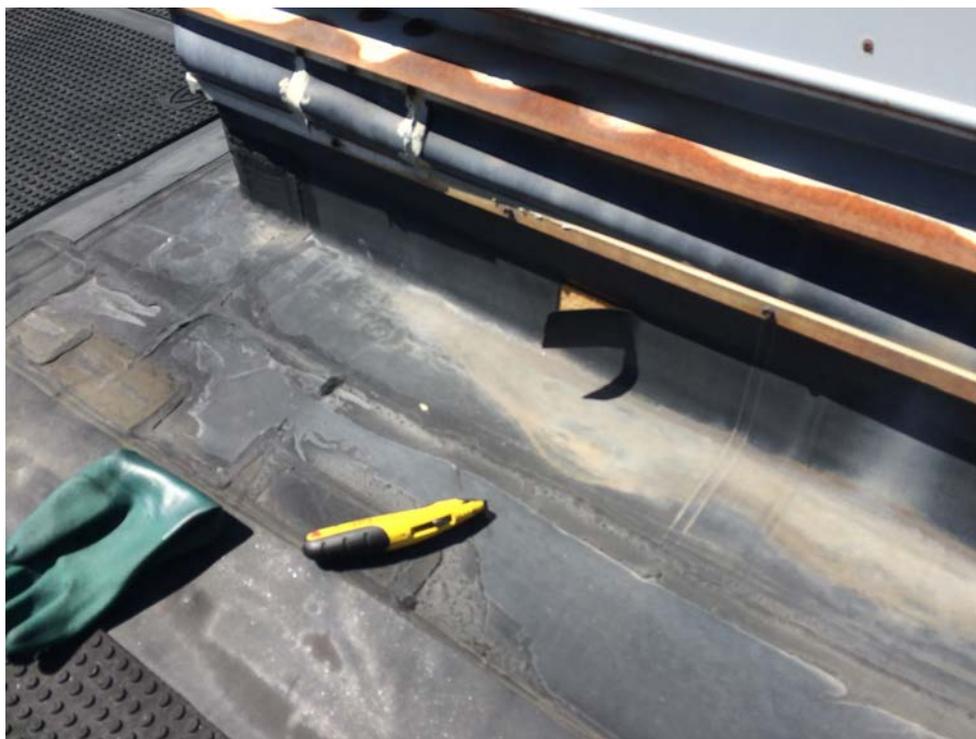


Photo depicts roofing materials at base of HVAC equipment.

PHOTOGRAPHIC DOCUMENTATION

99 Hawthorne Street

Chelsea, Massachusetts

Photographs Documented April 14, 2016

Project File P4012

Photo 5



Photo depicts a cut made in a roof sidewall area to observe roofing materials.

Photo 6



Photo depicts roofing samples collected from the Main Roof and submitted for laboratory analysis.

PHOTOGRAPHIC DOCUMENTATION

99 Hawthorne Street

Chelsea, Massachusetts

Photographs Documented April 14, 2016

Project File P4012

Attachment D

AEC Asbestos Analytical Laboratory Report, dated April 22, 2016



AEC
Laboratories, LLC

MA License: AA000197
CT License: PH-0124
VT License: AL877888

RI License: AAL-112A1
ME License: LB-0074

April 22, 2016

Client Name and Address:

Nover Armstrong Associates, Inc.
124 Main St., Unit 2GG
Carver, MA 02330

Re: Bulk Asbestos Results from Chelsea
99 Hawthorne Street; MA
Client Project Number: Not Provided

AEC Laboratory Number: **016362.00**

Dear Matthew Alger,

We at AEC Laboratories, LLC would like to thank you for your recent business. 3 sample(s) were received on 04/15/2016 from a job located at 99 Hawthorne Street; MA for 5 Day Turn Around Time. The final report is enclosed for the aforementioned samples.

Please note that this report conforms to all applicable State and Federal requirements. AEC Laboratories, LLC follows prescribed procedures for the analysis of bulk materials to identify and quantify asbestos type and content.

These results only pertain to this job and should not be used in the interpretation of any other job. This report may be reproduced only in its entirety.

Client confidentiality is strictly implemented. Test results or any other information regarding samples received by AEC Laboratories shall not be disclosed to a third party without the client's written permission or a compelling legal or court document.

If you have any questions please do not hesitate to call me at the number below.

Regards,

A handwritten signature in cursive script that reads "Valerica Stanca".

Valerica Stanca
Laboratory Manager

Enclosures:

- Analytical results
- Chain of Custody
- Client Communications and/or Project Unconformities (If Applicable)



814 Broad Street - Weymouth, MA 02189 - Ph. 781.337.0567

Client: Nover Armstrong Associates, Inc.
124 Main St., Unit 2GG
Carver, MA 02330

AEC Laboratories Project Number: 16362
Client Project Number: Not Provided

Attention: Matthew Alger
Phone: 508-866-8383 **Fax:**
Re: Chelsea

Date Sampled: 4/14/2016
Date Received: 4/15/2016
Date Analyzed: 4/21/2016
Date Reported: 4/22/2016

99 Hawthorne Street; MA

Client		Analysis by EPA Method 600/R-93/116						
Sample/ HA ID	Laboratory Sample ID	Location	Description	Asbestos Type(s)	Other Materials	Asbestos Present	Total Asbestos %	
1	16362-01.1	Main Roof-Upper Layer	Black, Heterogeneous, Built Up Roofing		Cellulose Nonfibrous	No	NAD	

Comments: Asphalt Shingle

Analyzed by: SG Date Analyzed: 4/21/16

1	16362-01.2	Main Roof-Upper Layer	Black, Homogenous, Built Up Roofing		Nonfibrous	No	NAD
---	------------	-----------------------------	---	--	------------	----	-----

Comments: Tar layer

Analyzed by: SG Date Analyzed: 4/21/16

1	16362-01.3	Main Roof-Upper Layer	Light Brown, Homogenous, Built Up Roofing		Cellulose Nonfibrous	No	NAD
---	------------	-----------------------------	---	--	-------------------------	----	-----

Comments: Fiber Board

Analyzed by: SG Date Analyzed: 4/21/16

2	16362-02.1	Main Roof-Lower Layers	Black, Homogenous, Coal Tar and Paper		Cellulose Nonfibrous	No	NAD
---	------------	------------------------------	---	--	-------------------------	----	-----

Comments: Paper

Analyzed by: SG Date Analyzed: 4/21/16

Reporting Notes: NAD = "No Asbestos Detected" PS = "Positive Stop" PR = "Present" <1% = Trace Due to inherent Polarized Light Microscope limitations, fibers and/or bundles below the resolution of the light microscope (approximately <.25 microns in width) will not be detected. "NAD" and "Trace" samples should be confirmed by Transmission Electron Microscopy. AEC Laboratories, LLC (AEC) maintains liability limited to cost of analysis only. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by AEC. AEC is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client. AEC retains all samples for thirty (30) days after reporting. After this period AEC will dispose of all samples according to all local, state, and federal guidelines, unless requested in writing by the client. All results are expressed as a percentage based on Calibrated Visual Estimate (CVE), unless otherwise noted. Distinct layers are noted by .1, .2, etc. suffixes to lab ID.



814 Broad Street - Weymouth, MA 02189 - Ph. 781.337.0567

Client: Nover Armstrong Associates, Inc.
124 Main St., Unit 2GG
Carver, MA 02330

AEC Laboratories Project Number: 16362
Client Project Number: Not Provided

Attention: Matthew Alger
Phone: 508-866-8383 **Fax:**
Re: Chelsea

Date Sampled: 4/14/2016
Date Received: 4/15/2016
Date Analyzed: 4/21/2016
Date Reported: 4/22/2016

99 Hawthorne Street; MA

Client		Analysis by EPA Method 600/R-93/116						
Sample/ HA ID	Laboratory Sample ID	Location	Description	Asbestos Type(s)	Other Materials	Asbestos Present	Total Asbestos %	
2	16362-02.2	Main Roof-Lower Layers	Black, Homogenous, Coal Tar and Paper		Nonfibrous	No	NAD	

Comments: Tar layer

Analyzed by: SG Date Analyzed: 4/21/16

3	16362-03.1	Flashing Materials	Black, Homogenous, Black Sealant and Fiberboard		Cellulose Nonfibrous	No	NAD
---	------------	-----------------------	--	--	-------------------------	----	-----

Comments: Black sealant

Analyzed by: SG Date Analyzed: 4/21/16

3	16362-03.2	Flashing Materials	Brown, Homogenous, Black Sealant and Fiberboard		Cellulose Nonfibrous	No	NAD
---	------------	-----------------------	--	--	-------------------------	----	-----

Comments: Fiber Board

Analyzed by: SG Date Analyzed: 4/21/16

Reviewed by: Matthew Cleveland

Signature:

Analyzed by: Sandhya Gunasekara

Signature:

Reporting Notes: NAD = "No Asbestos Detected" PS = "Positive Stop" PR = "Present" <1% = Trace Due to inherent Polarized Light Microscope limitations, fibers and/or bundles below the resolution of the light microscope (approximately <.25 microns in width) will not be detected. "NAD" and "Trace" samples should be confirmed by Transmission Electron Microscopy. AEC Laboratories, LLC (AEC) maintains liability limited to cost of analysis only. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by AEC. AEC is not responsible for sample collection activities or analytical limitations. Interpretation and use of results are the responsibility of the client. AEC retains all samples for thirty (30) days after reporting. After this period AEC will dispose of all samples according to all local, state, and federal guidelines, unless requested in writing by the client. All results are expressed as a percentage based on Calibrated Visual Estimate (CVE), unless otherwise noted. Distinct layers are noted by .1, .2, etc. suffixes to lab ID.

Attachment E

ESS Analytical Laboratory Report, dated April 25, 2016



CERTIFICATE OF ANALYSIS

Matt Alger
Nover-Armstrong Associates, Inc.
124 Main Street, Unit 2GG
Carver, MA 02330

RE: Chelsea (P4012)
ESS Laboratory Work Order Number: 1604433

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 5:35 pm, Apr 25, 2016

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with NELAC Standards, A2LA and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

SAMPLE RECEIPT

The following samples were received on April 15, 2016 for the analyses specified on the enclosed Chain of Custody Record.

Sample 1604433-01 for VOC was preserved at ESS Laboratory on April 18, 2016 at 1600.

Lab Number	Sample Name	Matrix	Analysis
1604433-01	Roof-Bottom Layers	Solid	6010C, 7010, 7471B, 8082A, 8260B, 8270D
1604433-02	Roof-Sealant	Solid	8082A



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Methanol

CZD0366-CCV1 [Continuing Calibration %Diff/Drift is above control limit \(CD+\).](#)
1,1-Dichloroethene (70% @ 30%)

8082A Polychlorinated Biphenyls (PCB)

1604433-01 [Surrogate recovery\(ies\) below lower control limit \(S-\).](#)
Tetrachloro-m-xylene [2C] (29% @ 30-150%)

8270D Semi-Volatile Organic Compounds

1604433-01 [Surrogate recovery\(ies\) diluted below the MRL \(SD\).](#)
1,2-Dichlorobenzene-d4 (% @ 30-130%), 2,4,6-Tribromophenol (359% @ 30-130%), 2-Chlorophenol-d4 (% @ 30-130%), 2-Fluorobiphenyl (% @ 30-130%), 2-Fluorophenol (% @ 30-130%), Nitrobenzene-d5 (% @ 30-130%), Phenol-d6 (% @ 30-130%), p-Terphenyl-d14 (% @ 30-130%)

CZD0270-CCV1 [Calibration required quadratic regression \(Q\).](#)
2,4-Dinitrophenol (87% @ 80-120%)

CZD0299-CCV1 [Calibration required quadratic regression \(Q\).](#)
2,4-Dinitrophenol (108% @ 80-120%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

- [Definitions of Quality Control Parameters](#)
- [Semivolatile Organics Internal Standard Information](#)
- [Semivolatile Organics Surrogate Information](#)
- [Volatile Organics Internal Standard Information](#)
- [Volatile Organics Surrogate Information](#)
- [EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015D - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

Prep Methods

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Bottom Layers
Date Sampled: 04/14/16 13:15
Percent Solids: N/A

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-01
Sample Matrix: Solid
Units: mg/kg wet

Extraction Method: 3050B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Arsenic	ND (4.63)		6010C		1	JP	04/20/16 18:41	1.08	100	CD61920
Barium	15.8 (4.63)		6010C		1	JP	04/20/16 18:41	1.08	100	CD61920
Cadmium	ND (0.93)		6010C		1	JP	04/20/16 18:41	1.08	100	CD61920
Chromium	3.42 (1.85)		6010C		1	JP	04/20/16 18:41	1.08	100	CD61920
Lead	21.2 (9.26)		6010C		1	JP	04/20/16 18:41	1.08	100	CD61920
Mercury	ND (0.032)		7471B		1	BJV	04/20/16 16:07	0.61	40	CD61811
Selenium	ND (4.63)		7010		5	JP	04/21/16 4:57	1.08	100	CD61920
Selenium	ND (9.26)		6010C		1	JP	04/20/16 18:41	1.08	100	CD61920
Silver	ND (0.93)		6010C		1	JP	04/20/16 18:41	1.08	100	CD61920



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Bottom Layers
Date Sampled: 04/14/16 13:15
Percent Solids: N/A
Initial Volume: 8.6
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-01
Sample Matrix: Solid
Units: mg/kg wet
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,1,1-Trichloroethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,1,2,2-Tetrachloroethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,1,2-Trichloroethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,1-Dichloroethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,1-Dichloroethene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,1-Dichloropropene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2,3-Trichlorobenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2,3-Trichloropropane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2,4-Trichlorobenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2,4-Trimethylbenzene	4.57 (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2-Dibromo-3-Chloropropane	ND (1.74)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2-Dibromoethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2-Dichlorobenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2-Dichloroethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,2-Dichloropropane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,3,5-Trimethylbenzene	1.83 (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,3-Dichlorobenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,3-Dichloropropane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,4-Dichlorobenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
1,4-Dioxane - Screen	ND (69.8)		8260B		1	04/21/16 20:24	CZD0347	CD62122
2,2-Dichloropropane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
2-Butanone	ND (1.74)		8260B		1	04/21/16 20:24	CZD0347	CD62122
2-Chlorotoluene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
2-Hexanone	ND (1.74)		8260B		1	04/21/16 20:24	CZD0347	CD62122
4-Chlorotoluene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
4-Isopropyltoluene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
4-Methyl-2-Pentanone	ND (1.74)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Acetone	ND (1.74)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Benzene	2.12 (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Bromobenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Bromochloromethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Bottom Layers
Date Sampled: 04/14/16 13:15
Percent Solids: N/A
Initial Volume: 8.6
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-01
Sample Matrix: Solid
Units: mg/kg wet
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromodichloromethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Bromoform	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Bromomethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Carbon Disulfide	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Carbon Tetrachloride	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Chlorobenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Chloroethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Chloroform	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Chloromethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
cis-1,2-Dichloroethene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
cis-1,3-Dichloropropene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Dibromochloromethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Dibromomethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Dichlorodifluoromethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Diethyl Ether	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Di-isopropyl ether	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Ethyl tertiary-butyl ether	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Ethylbenzene	0.799 (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Hexachlorobutadiene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Isopropylbenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Methyl tert-Butyl Ether	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Methylene Chloride	ND (0.698)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Naphthalene	2380 (34.9)		8260B		100	04/22/16 14:35	CZD0347	CD62122
n-Butylbenzene	0.537 (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
n-Propylbenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
sec-Butylbenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Styrene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
tert-Butylbenzene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Tertiary-amyl methyl ether	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Tetrachloroethene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Tetrahydrofuran	ND (1.74)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Toluene	3.06 (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Bottom Layers
Date Sampled: 04/14/16 13:15
Percent Solids: N/A
Initial Volume: 8.6
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-01
Sample Matrix: Solid
Units: mg/kg wet
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
trans-1,2-Dichloroethene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
trans-1,3-Dichloropropene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Trichloroethene	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Trichlorofluoromethane	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Vinyl Chloride	ND (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Xylene O	1.96 (0.349)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Xylene P,M	4.45 (0.698)		8260B		1	04/21/16 20:24	CZD0347	CD62122
Xylenes (Total)	6.41 (0.698)		8260B		1	04/21/16 20:24		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	75 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	91 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	84 %		70-130
<i>Surrogate: Toluene-d8</i>	97 %		70-130



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Bottom Layers
Date Sampled: 04/14/16 13:15
Percent Solids: N/A
Initial Volume: 5.02
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-01
Sample Matrix: Solid
Units: mg/kg wet
Analyst: TJ
Prepared: 4/18/16 17:30
Cleanup Method: 3665A

8082A Polychlorinated Biphenyls (PCB)

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.199)		8082A		1	04/25/16 13:57		CD61823
Aroclor 1221	ND (0.199)		8082A		1	04/25/16 13:57		CD61823
Aroclor 1232	ND (0.199)		8082A		1	04/25/16 13:57		CD61823
Aroclor 1242	ND (0.199)		8082A		1	04/25/16 13:57		CD61823
Aroclor 1248	ND (0.199)		8082A		1	04/25/16 13:57		CD61823
Aroclor 1254	ND (0.199)		8082A		1	04/25/16 13:57		CD61823
Aroclor 1260	ND (0.199)		8082A		1	04/25/16 13:57		CD61823
Aroclor 1262	ND (0.199)		8082A		1	04/25/16 13:57		CD61823
Aroclor 1268	ND (0.199)		8082A		1	04/25/16 13:57		CD61823

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	45 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	53 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	39 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	29 %	S-	30-150



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Bottom Layers
Date Sampled: 04/14/16 13:15
Percent Solids: N/A
Initial Volume: 2.02
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-01
Sample Matrix: Solid
Units: mg/kg wet
Analyst: IBM
Prepared: 4/19/16 12:05

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,2,4-Trichlorobenzene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
1,2-Dichlorobenzene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
1,3-Dichlorobenzene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
1,4-Dichlorobenzene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2,4,5-Trichlorophenol	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2,4,6-Trichlorophenol	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2,4-Dichlorophenol	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2,4-Dimethylphenol	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2,4-Dinitrophenol	ND (1240)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2,4-Dinitrotoluene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2,6-Dinitrotoluene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2-Chloronaphthalene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2-Chlorophenol	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2-Methylnaphthalene	1410 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2-Methylphenol	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
2-Nitrophenol	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
3,3'-Dichlorobenzidine	ND (495)		8270D		10	04/19/16 20:31	CZD0299	CD61837
3+4-Methylphenol	ND (495)		8270D		10	04/19/16 20:31	CZD0299	CD61837
4-Bromophenyl-phenylether	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
4-Chloroaniline	ND (495)		8270D		10	04/19/16 20:31	CZD0299	CD61837
4-Nitrophenol	ND (1240)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Acenaphthene	1910 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Acenaphthylene	420 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Acetophenone	ND (495)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Aniline	ND (1240)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Anthracene	4090 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Azobenzene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Benzo(a)anthracene	4850 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Benzo(a)pyrene	3800 (124)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Benzo(b)fluoranthene	4710 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Benzo(g,h,i)perylene	1590 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Benzo(k)fluoranthene	1540 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Bottom Layers
Date Sampled: 04/14/16 13:15
Percent Solids: N/A
Initial Volume: 2.02
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-01
Sample Matrix: Solid
Units: mg/kg wet
Analyst: IBM
Prepared: 4/19/16 12:05

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
bis(2-Chloroethoxy)methane	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
bis(2-Chloroethyl)ether	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
bis(2-chloroisopropyl)Ether	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
bis(2-Ethylhexyl)phthalate	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Butylbenzylphthalate	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Chrysene	4500 (124)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Dibenzo(a,h)Anthracene	844 (124)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Dibenzofuran	2050 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Diethylphthalate	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Dimethylphthalate	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Di-n-butylphthalate	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Di-n-octylphthalate	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Fluoranthene	14300 (2470)		8270D		100	04/20/16 16:55	CZD0299	CD61837
Fluorene	3230 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Hexachlorobenzene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Hexachlorobutadiene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Hexachloroethane	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Indeno(1,2,3-cd)Pyrene	1550 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Isophorone	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Naphthalene	6900 (2470)		8270D		100	04/20/16 16:55	CZD0299	CD61837
Nitrobenzene	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
N-Nitrosodimethylamine	ND (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Pentachlorophenol	ND (1240)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Phenanthrene	15700 (2470)		8270D		100	04/20/16 16:55	CZD0299	CD61837
Phenol	388 (247)		8270D		10	04/19/16 20:31	CZD0299	CD61837
Pyrene	9570 (2470)		8270D		100	04/20/16 16:55	CZD0299	CD61837

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	%	SD	30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	359 %	SD	30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	%	SD	30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	%	SD	30-130
<i>Surrogate: 2-Fluorophenol</i>	%	SD	30-130



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Bottom Layers
Date Sampled: 04/14/16 13:15
Percent Solids: N/A
Initial Volume: 2.02
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-01
Sample Matrix: Solid
Units: mg/kg wet
Analyst: IBM
Prepared: 4/19/16 12:05

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<i>Surrogate: Nitrobenzene-d5</i>		%	SD	30-130				
<i>Surrogate: Phenol-d6</i>		%	SD	30-130				
<i>Surrogate: p-Terphenyl-d14</i>		%	SD	30-130				



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea
Client Sample ID: Roof-Sealant
Date Sampled: 04/14/16 13:30
Percent Solids: N/A
Initial Volume: 0.7
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1604433
ESS Laboratory Sample ID: 1604433-02
Sample Matrix: Solid
Units: mg/kg wet
Analyst: TJ
Prepared: 4/18/16 17:30
Cleanup Method: 3665A

8082A Polychlorinated Biphenyls (PCB)

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (1.43)		8082A		1	04/25/16 7:51		CD61823
Aroclor 1221	ND (1.43)		8082A		1	04/25/16 7:51		CD61823
Aroclor 1232	ND (1.43)		8082A		1	04/25/16 7:51		CD61823
Aroclor 1242	ND (1.43)		8082A		1	04/25/16 7:51		CD61823
Aroclor 1248	ND (1.43)		8082A		1	04/25/16 7:51		CD61823
Aroclor 1254	ND (1.43)		8082A		1	04/25/16 7:51		CD61823
Aroclor 1260	ND (1.43)		8082A		1	04/25/16 7:51		CD61823
Aroclor 1262	ND (1.43)		8082A		1	04/25/16 7:51		CD61823
Aroclor 1268	ND (1.43)		8082A		1	04/25/16 7:51		CD61823

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	63 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	61 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	76 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	65 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

Batch CD61811 - 7471B

Blank

Mercury	ND	0.033	mg/kg wet							
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LCS

Mercury	16.8	1.94	mg/kg wet	15.90		106	80-120			
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LCS Dup

Mercury	16.7	1.68	mg/kg wet	15.90		105	80-120	0.7	20	
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Batch CD61920 - 3050B

Blank

Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Selenium	ND	0.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							

LCS

Arsenic	161	8.77	mg/kg wet	161.0		100	80-120			
Barium	332	8.77	mg/kg wet	351.0		95	80-120			
Cadmium	172	1.75	mg/kg wet	190.0		91	80-120			
Chromium	83.4	3.51	mg/kg wet	87.90		95	80-120			
Lead	137	17.5	mg/kg wet	138.0		99	80-120			
Selenium	313	43.9	mg/kg wet	305.0		103	80-120			
Selenium	299	17.5	mg/kg wet	305.0		98	80-120			
Silver	56.5	1.75	mg/kg wet	58.00		97	80-120			

LCS Dup

Arsenic	166	9.09	mg/kg wet	161.0		103	80-120	3	20	
Barium	341	9.09	mg/kg wet	351.0		97	80-120	3	20	
Cadmium	178	1.82	mg/kg wet	190.0		93	80-120	3	20	
Chromium	86.1	3.64	mg/kg wet	87.90		98	80-120	3	20	
Lead	142	18.2	mg/kg wet	138.0		103	80-120	3	20	
Selenium	307	18.2	mg/kg wet	305.0		101	80-120	3	20	
Selenium	330	45.5	mg/kg wet	305.0		108	80-120	5	20	
Silver	58.6	1.82	mg/kg wet	58.00		101	80-120	4	20	

5035/8260B Volatile Organic Compounds / Methanol

Batch CD62122 - 5035

Blank

1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

Batch CD62122 - 5035

1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

Batch CD62122 - 5035

Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	4.33		mg/kg wet	5.000		87	70-130			
Surrogate: 4-Bromofluorobenzene	4.32		mg/kg wet	5.000		86	70-130			
Surrogate: Dibromofluoromethane	4.74		mg/kg wet	5.000		95	70-130			
Surrogate: Toluene-d8	5.38		mg/kg wet	5.000		108	70-130			

LCS

1,1,1,2-Tetrachloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130			
1,1,1-Trichloroethane	1.75	0.200	mg/kg wet	2.000		87	70-130			
1,1,2,2-Tetrachloroethane	1.97	0.200	mg/kg wet	2.000		98	70-130			
1,1,2-Trichloroethane	1.78	0.200	mg/kg wet	2.000		89	70-130			
1,1-Dichloroethane	1.78	0.200	mg/kg wet	2.000		89	70-130			
1,1-Dichloroethene	2.29	0.200	mg/kg wet	2.000		115	70-130			
1,1-Dichloropropene	1.87	0.200	mg/kg wet	2.000		94	70-130			
1,2,3-Trichlorobenzene	2.30	0.200	mg/kg wet	2.000		115	70-130			
1,2,3-Trichloropropane	1.97	0.200	mg/kg wet	2.000		99	70-130			
1,2,4-Trichlorobenzene	2.15	0.200	mg/kg wet	2.000		108	70-130			
1,2,4-Trimethylbenzene	1.92	0.200	mg/kg wet	2.000		96	70-130			
1,2-Dibromo-3-Chloropropane	2.22	1.00	mg/kg wet	2.000		111	70-130			
1,2-Dibromoethane	2.01	0.200	mg/kg wet	2.000		100	70-130			
1,2-Dichlorobenzene	2.07	0.200	mg/kg wet	2.000		103	70-130			
1,2-Dichloroethane	1.79	0.200	mg/kg wet	2.000		90	70-130			
1,2-Dichloropropane	1.85	0.200	mg/kg wet	2.000		93	70-130			
1,3,5-Trimethylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130			
1,3-Dichlorobenzene	2.06	0.200	mg/kg wet	2.000		103	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CD62122 - 5035										
1,3-Dichloropropane	2.11	0.200	mg/kg wet	2.000		105	70-130			
1,4-Dichlorobenzene	2.04	0.200	mg/kg wet	2.000		102	70-130			
1,4-Dioxane - Screen	39.2	40.0	mg/kg wet	40.00		98	44-241			
2,2-Dichloropropane	1.77	0.200	mg/kg wet	2.000		88	70-130			
2-Butanone	8.68	1.00	mg/kg wet	10.00		87	70-130			
2-Chlorotoluene	2.14	0.200	mg/kg wet	2.000		107	70-130			
2-Hexanone	10.9	1.00	mg/kg wet	10.00		109	70-130			
4-Chlorotoluene	2.15	0.200	mg/kg wet	2.000		107	70-130			
4-Isopropyltoluene	2.03	0.200	mg/kg wet	2.000		102	70-130			
4-Methyl-2-Pentanone	10.2	1.00	mg/kg wet	10.00		102	70-130			
Acetone	11.6	1.00	mg/kg wet	10.00		116	70-130			
Benzene	1.84	0.200	mg/kg wet	2.000		92	70-130			
Bromobenzene	2.16	0.200	mg/kg wet	2.000		108	70-130			
Bromochloromethane	1.85	0.200	mg/kg wet	2.000		93	70-130			
Bromodichloromethane	1.77	0.200	mg/kg wet	2.000		88	70-130			
Bromoform	1.90	0.200	mg/kg wet	2.000		95	70-130			
Bromomethane	2.15	0.200	mg/kg wet	2.000		108	70-130			
Carbon Disulfide	2.16	0.200	mg/kg wet	2.000		108	70-130			
Carbon Tetrachloride	1.81	0.200	mg/kg wet	2.000		90	70-130			
Chlorobenzene	1.95	0.200	mg/kg wet	2.000		98	70-130			
Chloroethane	1.71	0.200	mg/kg wet	2.000		85	70-130			
Chloroform	1.73	0.200	mg/kg wet	2.000		87	70-130			
Chloromethane	1.62	0.200	mg/kg wet	2.000		81	70-130			
cis-1,2-Dichloroethene	1.96	0.200	mg/kg wet	2.000		98	70-130			
cis-1,3-Dichloropropene	1.96	0.200	mg/kg wet	2.000		98	70-130			
Dibromochloromethane	2.11	0.200	mg/kg wet	2.000		105	70-130			
Dibromomethane	1.84	0.200	mg/kg wet	2.000		92	70-130			
Dichlorodifluoromethane	1.43	0.200	mg/kg wet	2.000		72	70-130			
Diethyl Ether	2.40	0.200	mg/kg wet	2.000		120	70-130			
Di-isopropyl ether	1.78	0.200	mg/kg wet	2.000		89	70-130			
Ethyl tertiary-butyl ether	1.89	0.200	mg/kg wet	2.000		94	70-130			
Ethylbenzene	2.09	0.200	mg/kg wet	2.000		104	70-130			
Hexachlorobutadiene	2.33	0.200	mg/kg wet	2.000		117	70-130			
Isopropylbenzene	2.04	0.200	mg/kg wet	2.000		102	70-130			
Methyl tert-Butyl Ether	1.90	0.200	mg/kg wet	2.000		95	70-130			
Methylene Chloride	1.96	0.400	mg/kg wet	2.000		98	70-130			
Naphthalene	2.25	0.200	mg/kg wet	2.000		113	70-130			
n-Butylbenzene	2.07	0.200	mg/kg wet	2.000		104	70-130			
n-Propylbenzene	2.03	0.200	mg/kg wet	2.000		101	70-130			
sec-Butylbenzene	2.14	0.200	mg/kg wet	2.000		107	70-130			
Styrene	1.89	0.200	mg/kg wet	2.000		95	70-130			
tert-Butylbenzene	2.09	0.200	mg/kg wet	2.000		104	70-130			
Tertiary-amyl methyl ether	1.85	0.200	mg/kg wet	2.000		92	70-130			
Tetrachloroethene	1.69	0.200	mg/kg wet	2.000		84	70-130			
Tetrahydrofuran	2.08	1.00	mg/kg wet	2.000		104	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

Batch CD62122 - 5035

Toluene	1.99	0.200	mg/kg wet	2.000		100	70-130			
trans-1,2-Dichloroethene	1.99	0.200	mg/kg wet	2.000		100	70-130			
trans-1,3-Dichloropropene	1.90	0.200	mg/kg wet	2.000		95	70-130			
Trichloroethene	1.84	0.200	mg/kg wet	2.000		92	70-130			
Trichlorofluoromethane	1.75	0.200	mg/kg wet	2.000		88	70-130			
Vinyl Chloride	1.71	0.200	mg/kg wet	2.000		85	70-130			
Xylene O	1.98	0.200	mg/kg wet	2.000		99	70-130			
Xylene P,M	4.02	0.400	mg/kg wet	4.000		100	70-130			
Xylenes (Total)	5.99	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	4.31		mg/kg wet	5.000		86	70-130			
Surrogate: 4-Bromofluorobenzene	5.07		mg/kg wet	5.000		101	70-130			
Surrogate: Dibromofluoromethane	4.65		mg/kg wet	5.000		93	70-130			
Surrogate: Toluene-d8	5.60		mg/kg wet	5.000		112	70-130			

LCS Dup

1,1,1,2-Tetrachloroethane	1.87	0.200	mg/kg wet	2.000		94	70-130	3	25	
1,1,1-Trichloroethane	1.78	0.200	mg/kg wet	2.000		89	70-130	2	25	
1,1,2,2-Tetrachloroethane	1.93	0.200	mg/kg wet	2.000		96	70-130	2	25	
1,1,2-Trichloroethane	1.71	0.200	mg/kg wet	2.000		85	70-130	4	25	
1,1-Dichloroethane	1.72	0.200	mg/kg wet	2.000		86	70-130	4	25	
1,1-Dichloroethene	2.38	0.200	mg/kg wet	2.000		119	70-130	4	25	
1,1-Dichloropropene	1.86	0.200	mg/kg wet	2.000		93	70-130	0.8	25	
1,2,3-Trichlorobenzene	2.05	0.200	mg/kg wet	2.000		102	70-130	12	25	
1,2,3-Trichloropropane	1.87	0.200	mg/kg wet	2.000		93	70-130	6	25	
1,2,4-Trichlorobenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	4	25	
1,2,4-Trimethylbenzene	1.88	0.200	mg/kg wet	2.000		94	70-130	2	25	
1,2-Dibromo-3-Chloropropane	1.85	1.00	mg/kg wet	2.000		93	70-130	18	25	
1,2-Dibromoethane	2.00	0.200	mg/kg wet	2.000		100	70-130	0.4	25	
1,2-Dichlorobenzene	2.01	0.200	mg/kg wet	2.000		100	70-130	3	25	
1,2-Dichloroethane	1.74	0.200	mg/kg wet	2.000		87	70-130	3	25	
1,2-Dichloropropane	1.81	0.200	mg/kg wet	2.000		91	70-130	2	25	
1,3,5-Trimethylbenzene	1.91	0.200	mg/kg wet	2.000		96	70-130	5	25	
1,3-Dichlorobenzene	2.01	0.200	mg/kg wet	2.000		100	70-130	2	25	
1,3-Dichloropropane	2.09	0.200	mg/kg wet	2.000		105	70-130	0.7	25	
1,4-Dichlorobenzene	2.02	0.200	mg/kg wet	2.000		101	70-130	1	25	
1,4-Dioxane - Screen	41.9	40.0	mg/kg wet	40.00		105	44-241	7	200	
2,2-Dichloropropane	1.80	0.200	mg/kg wet	2.000		90	70-130	2	25	
2-Butanone	8.52	1.00	mg/kg wet	10.00		85	70-130	2	25	
2-Chlorotoluene	2.08	0.200	mg/kg wet	2.000		104	70-130	3	25	
2-Hexanone	9.63	1.00	mg/kg wet	10.00		96	70-130	12	25	
4-Chlorotoluene	2.07	0.200	mg/kg wet	2.000		104	70-130	3	25	
4-Isopropyltoluene	1.89	0.200	mg/kg wet	2.000		94	70-130	7	25	
4-Methyl-2-Pentanone	9.44	1.00	mg/kg wet	10.00		94	70-130	8	25	
Acetone	10.2	1.00	mg/kg wet	10.00		102	70-130	12	25	
Benzene	1.87	0.200	mg/kg wet	2.000		93	70-130	1	25	
Bromobenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	5	25	



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CD62122 - 5035										
Bromochloromethane	1.77	0.200	mg/kg wet	2.000		89	70-130	4	25	
Bromodichloromethane	1.78	0.200	mg/kg wet	2.000		89	70-130	0.3	25	
Bromoform	1.78	0.200	mg/kg wet	2.000		89	70-130	6	25	
Bromomethane	2.11	0.200	mg/kg wet	2.000		106	70-130	2	25	
Carbon Disulfide	2.11	0.200	mg/kg wet	2.000		106	70-130	2	25	
Carbon Tetrachloride	1.86	0.200	mg/kg wet	2.000		93	70-130	3	25	
Chlorobenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	1	25	
Chloroethane	1.81	0.200	mg/kg wet	2.000		91	70-130	6	25	
Chloroform	1.73	0.200	mg/kg wet	2.000		87	70-130	0.1	25	
Chloromethane	1.52	0.200	mg/kg wet	2.000		76	70-130	6	25	
cis-1,2-Dichloroethene	1.95	0.200	mg/kg wet	2.000		98	70-130	0.3	25	
cis-1,3-Dichloropropene	1.98	0.200	mg/kg wet	2.000		99	70-130	0.7	25	
Dibromochloromethane	2.06	0.200	mg/kg wet	2.000		103	70-130	2	25	
Dibromomethane	1.76	0.200	mg/kg wet	2.000		88	70-130	4	25	
Dichlorodifluoromethane	1.46	0.200	mg/kg wet	2.000		73	70-130	2	25	
Diethyl Ether	2.43	0.200	mg/kg wet	2.000		121	70-130	1	25	
Di-isopropyl ether	1.83	0.200	mg/kg wet	2.000		91	70-130	3	25	
Ethyl tertiary-butyl ether	1.89	0.200	mg/kg wet	2.000		94	70-130	0.1	25	
Ethylbenzene	2.09	0.200	mg/kg wet	2.000		105	70-130	0.3	25	
Hexachlorobutadiene	2.23	0.200	mg/kg wet	2.000		112	70-130	4	25	
Isopropylbenzene	2.02	0.200	mg/kg wet	2.000		101	70-130	1	25	
Methyl tert-Butyl Ether	1.87	0.200	mg/kg wet	2.000		94	70-130	2	25	
Methylene Chloride	1.95	0.400	mg/kg wet	2.000		98	70-130	0.7	25	
Naphthalene	2.07	0.200	mg/kg wet	2.000		104	70-130	8	25	
n-Butylbenzene	1.92	0.200	mg/kg wet	2.000		96	70-130	7	25	
n-Propylbenzene	1.95	0.200	mg/kg wet	2.000		98	70-130	4	25	
sec-Butylbenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	8	25	
Styrene	1.89	0.200	mg/kg wet	2.000		94	70-130	0.3	25	
tert-Butylbenzene	2.02	0.200	mg/kg wet	2.000		101	70-130	3	25	
Tertiary-amyl methyl ether	1.93	0.200	mg/kg wet	2.000		96	70-130	4	25	
Tetrachloroethene	1.65	0.200	mg/kg wet	2.000		83	70-130	2	25	
Tetrahydrofuran	2.20	1.00	mg/kg wet	2.000		110	70-130	6	25	
Toluene	2.01	0.200	mg/kg wet	2.000		101	70-130	1	25	
trans-1,2-Dichloroethene	1.99	0.200	mg/kg wet	2.000		100	70-130	0	25	
trans-1,3-Dichloropropene	1.86	0.200	mg/kg wet	2.000		93	70-130	3	25	
Trichloroethene	1.85	0.200	mg/kg wet	2.000		93	70-130	0.5	25	
Trichlorofluoromethane	1.76	0.200	mg/kg wet	2.000		88	70-130	0.8	25	
Vinyl Chloride	1.71	0.200	mg/kg wet	2.000		86	70-130	0.4	25	
Xylene O	1.94	0.200	mg/kg wet	2.000		97	70-130	2	25	
Xylene P,M	3.94	0.400	mg/kg wet	4.000		99	70-130	2	25	
Xylenes (Total)	5.88	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	4.41		mg/kg wet	5.000		88	70-130			
Surrogate: 4-Bromofluorobenzene	4.98		mg/kg wet	5.000		100	70-130			
Surrogate: Dibromofluoromethane	4.69		mg/kg wet	5.000		94	70-130			
Surrogate: Toluene-d8	5.60		mg/kg wet	5.000		112	70-130			



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8082A Polychlorinated Biphenyls (PCB)

Batch CD61823 - 3540C

Blank

Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							

Surrogate: Decachlorobiphenyl	0.0158		mg/kg wet	0.02500		63	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0169		mg/kg wet	0.02500		67	30-150			
Surrogate: Tetrachloro-m-xylene	0.0192		mg/kg wet	0.02500		77	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0188		mg/kg wet	0.02500		75	30-150			

LCS

Aroclor 1016	0.463	0.0500	mg/kg wet	0.5000		93	40-140			
Aroclor 1260	0.469	0.0500	mg/kg wet	0.5000		94	40-140			
Surrogate: Decachlorobiphenyl	0.0167		mg/kg wet	0.02500		67	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0182		mg/kg wet	0.02500		73	30-150			
Surrogate: Tetrachloro-m-xylene	0.0201		mg/kg wet	0.02500		80	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0206		mg/kg wet	0.02500		83	30-150			

LCS Dup

Aroclor 1016	0.456	0.0500	mg/kg wet	0.5000		91	40-140	2	30	
Aroclor 1260	0.465	0.0500	mg/kg wet	0.5000		93	40-140	0.9	30	
Surrogate: Decachlorobiphenyl	0.0168		mg/kg wet	0.02500		67	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0182		mg/kg wet	0.02500		73	30-150			
Surrogate: Tetrachloro-m-xylene	0.0195		mg/kg wet	0.02500		78	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0201		mg/kg wet	0.02500		80	30-150			

8270D Semi-Volatile Organic Compounds

Batch CD61837 - 3546

Blank

1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Semi-Volatile Organic Compounds

Batch CD61837 - 3546

2,6-Dinitrotoluene	ND	0.333	mg/kg wet
2-Chloronaphthalene	ND	0.333	mg/kg wet
2-Chlorophenol	ND	0.333	mg/kg wet
2-Methylnaphthalene	ND	0.333	mg/kg wet
2-Methylphenol	ND	0.333	mg/kg wet
2-Nitrophenol	ND	0.333	mg/kg wet
3,3'-Dichlorobenzidine	ND	0.667	mg/kg wet
3+4-Methylphenol	ND	0.667	mg/kg wet
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet
4-Chloroaniline	ND	0.667	mg/kg wet
4-Nitrophenol	ND	1.67	mg/kg wet
Acenaphthene	ND	0.333	mg/kg wet
Acenaphthylene	ND	0.333	mg/kg wet
Acetophenone	ND	0.667	mg/kg wet
Aniline	ND	1.67	mg/kg wet
Anthracene	ND	0.333	mg/kg wet
Azobenzene	ND	0.333	mg/kg wet
Benzo(a)anthracene	ND	0.333	mg/kg wet
Benzo(a)pyrene	ND	0.167	mg/kg wet
Benzo(b)fluoranthene	ND	0.333	mg/kg wet
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet
Benzo(k)fluoranthene	ND	0.333	mg/kg wet
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet
Butylbenzylphthalate	ND	0.333	mg/kg wet
Chrysene	ND	0.167	mg/kg wet
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet
Dibenzofuran	ND	0.333	mg/kg wet
Diethylphthalate	ND	0.333	mg/kg wet
Dimethylphthalate	ND	0.333	mg/kg wet
Di-n-butylphthalate	ND	0.333	mg/kg wet
Di-n-octylphthalate	ND	0.333	mg/kg wet
Fluoranthene	ND	0.333	mg/kg wet
Fluorene	ND	0.333	mg/kg wet
Hexachlorobenzene	ND	0.333	mg/kg wet
Hexachlorobutadiene	ND	0.333	mg/kg wet
Hexachloroethane	ND	0.333	mg/kg wet
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet
Isophorone	ND	0.333	mg/kg wet
Naphthalene	ND	0.333	mg/kg wet
Nitrobenzene	ND	0.333	mg/kg wet
N-Nitrosodimethylamine	ND	0.333	mg/kg wet
Pentachlorophenol	ND	1.67	mg/kg wet



CERTIFICATE OF ANALYSIS

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Quality Control Data

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8270D Semi-Volatile Organic Compounds

Batch CD61837 - 3546

Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.31		mg/kg wet	3.333		69	30-130			
Surrogate: 2,4,6-Tribromophenol	2.75		mg/kg wet	5.000		55	30-130			
Surrogate: 2-Chlorophenol-d4	3.55		mg/kg wet	5.000		71	30-130			
Surrogate: 2-Fluorobiphenyl	2.36		mg/kg wet	3.333		71	30-130			
Surrogate: 2-Fluorophenol	3.42		mg/kg wet	5.000		68	30-130			
Surrogate: Nitrobenzene-d5	2.28		mg/kg wet	3.333		69	30-130			
Surrogate: Phenol-d6	3.62		mg/kg wet	5.000		72	30-130			
Surrogate: p-Terphenyl-d14	3.00		mg/kg wet	3.333		90	30-130			

LCS

1,2,4-Trichlorobenzene	2.31	0.333	mg/kg wet	3.333		69	40-140			
1,2-Dichlorobenzene	2.17	0.333	mg/kg wet	3.333		65	40-140			
1,3-Dichlorobenzene	2.14	0.333	mg/kg wet	3.333		64	40-140			
1,4-Dichlorobenzene	2.15	0.333	mg/kg wet	3.333		64	40-140			
2,4,5-Trichlorophenol	2.88	0.333	mg/kg wet	3.333		87	30-130			
2,4,6-Trichlorophenol	2.72	0.333	mg/kg wet	3.333		82	30-130			
2,4-Dichlorophenol	2.39	0.333	mg/kg wet	3.333		72	30-130			
2,4-Dimethylphenol	2.39	0.333	mg/kg wet	3.333		72	30-130			
2,4-Dinitrophenol	1.97	1.67	mg/kg wet	3.333		59	30-130			
2,4-Dinitrotoluene	2.93	0.333	mg/kg wet	3.333		88	40-140			
2,6-Dinitrotoluene	2.67	0.333	mg/kg wet	3.333		80	40-140			
2-Chloronaphthalene	2.20	0.333	mg/kg wet	3.333		66	40-140			
2-Chlorophenol	2.21	0.333	mg/kg wet	3.333		66	30-130			
2-Methylnaphthalene	2.13	0.333	mg/kg wet	3.333		64	40-140			
2-Methylphenol	2.26	0.333	mg/kg wet	3.333		68	30-130			
2-Nitrophenol	2.11	0.333	mg/kg wet	3.333		63	30-130			
3,3'-Dichlorobenzidine	2.07	0.667	mg/kg wet	3.333		62	40-140			
3+4-Methylphenol	4.96	0.667	mg/kg wet	6.667		74	30-130			
4-Bromophenyl-phenylether	2.76	0.333	mg/kg wet	3.333		83	40-140			
4-Chloroaniline	2.06	0.667	mg/kg wet	3.333		62	40-140			
4-Nitrophenol	2.60	1.67	mg/kg wet	3.333		78	30-130			
Acenaphthene	2.47	0.333	mg/kg wet	3.333		74	40-140			
Acenaphthylene	2.52	0.333	mg/kg wet	3.333		76	40-140			
Acetophenone	2.27	0.667	mg/kg wet	3.333		68	40-140			
Aniline	1.73	1.67	mg/kg wet	3.333		52	40-140			
Anthracene	2.75	0.333	mg/kg wet	3.333		82	40-140			
Azobenzene	2.54	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)anthracene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Benzo(a)pyrene	2.88	0.167	mg/kg wet	3.333		86	40-140			
Benzo(b)fluoranthene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Benzo(g,h,i)perylene	2.85	0.333	mg/kg wet	3.333		86	40-140			
Benzo(k)fluoranthene	2.66	0.333	mg/kg wet	3.333		80	40-140			
bis(2-Chloroethoxy)methane	2.24	0.333	mg/kg wet	3.333		67	40-140			



CERTIFICATE OF ANALYSIS

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Quality Control Data

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8270D Semi-Volatile Organic Compounds

Batch CD61837 - 3546

bis(2-Chloroethyl)ether	2.17	0.333	mg/kg wet	3.333		65	40-140			
bis(2-chloroisopropyl)Ether	2.16	0.333	mg/kg wet	3.333		65	40-140			
bis(2-Ethylhexyl)phthalate	3.14	0.333	mg/kg wet	3.333		94	40-140			
Butylbenzylphthalate	2.99	0.333	mg/kg wet	3.333		90	40-140			
Chrysene	2.78	0.167	mg/kg wet	3.333		83	40-140			
Dibenzo(a,h)Anthracene	2.89	0.167	mg/kg wet	3.333		87	40-140			
Dibenzofuran	2.47	0.333	mg/kg wet	3.333		74	40-140			
Diethylphthalate	2.75	0.333	mg/kg wet	3.333		83	40-140			
Dimethylphthalate	2.70	0.333	mg/kg wet	3.333		81	40-140			
Di-n-butylphthalate	3.01	0.333	mg/kg wet	3.333		90	40-140			
Di-n-octylphthalate	2.67	0.333	mg/kg wet	3.333		80	40-140			
Fluoranthene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Fluorene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Hexachlorobenzene	2.61	0.333	mg/kg wet	3.333		78	40-140			
Hexachlorobutadiene	2.19	0.333	mg/kg wet	3.333		66	40-140			
Hexachloroethane	2.08	0.333	mg/kg wet	3.333		62	40-140			
Indeno(1,2,3-cd)Pyrene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Isophorone	2.20	0.333	mg/kg wet	3.333		66	40-140			
Naphthalene	2.28	0.333	mg/kg wet	3.333		68	40-140			
Nitrobenzene	2.15	0.333	mg/kg wet	3.333		65	40-140			
N-Nitrosodimethylamine	1.77	0.333	mg/kg wet	3.333		53	40-140			
Pentachlorophenol	2.65	1.67	mg/kg wet	3.333		80	30-130			
Phenanthrene	2.65	0.333	mg/kg wet	3.333		80	40-140			
Phenol	2.26	0.333	mg/kg wet	3.333		68	30-130			
Pyrene	2.72	0.333	mg/kg wet	3.333		82	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.21		mg/kg wet	3.333		66	30-130			
Surrogate: 2,4,6-Tribromophenol	4.17		mg/kg wet	5.000		83	30-130			
Surrogate: 2-Chlorophenol-d4	3.55		mg/kg wet	5.000		71	30-130			
Surrogate: 2-Fluorobiphenyl	2.43		mg/kg wet	3.333		73	30-130			
Surrogate: 2-Fluorophenol	3.38		mg/kg wet	5.000		68	30-130			
Surrogate: Nitrobenzene-d5	2.27		mg/kg wet	3.333		68	30-130			
Surrogate: Phenol-d6	3.60		mg/kg wet	5.000		72	30-130			
Surrogate: p-Terphenyl-d14	2.94		mg/kg wet	3.333		88	30-130			

LCS Dup

1,2,4-Trichlorobenzene	2.78	0.333	mg/kg wet	3.333		83	40-140	18	30	
1,2-Dichlorobenzene	2.61	0.333	mg/kg wet	3.333		78	40-140	19	30	
1,3-Dichlorobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140	19	30	
1,4-Dichlorobenzene	2.61	0.333	mg/kg wet	3.333		78	40-140	19	30	
2,4,5-Trichlorophenol	3.06	0.333	mg/kg wet	3.333		92	30-130	6	30	
2,4,6-Trichlorophenol	3.11	0.333	mg/kg wet	3.333		93	30-130	13	30	
2,4-Dichlorophenol	2.80	0.333	mg/kg wet	3.333		84	30-130	16	30	
2,4-Dimethylphenol	2.79	0.333	mg/kg wet	3.333		84	30-130	16	30	
2,4-Dinitrophenol	2.21	1.67	mg/kg wet	3.333		66	30-130	11	30	
2,4-Dinitrotoluene	3.15	0.333	mg/kg wet	3.333		95	40-140	7	30	
2,6-Dinitrotoluene	2.86	0.333	mg/kg wet	3.333		86	40-140	7	30	



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Quality Control Data

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8270D Semi-Volatile Organic Compounds

Batch CD61837 - 3546

2-Chloronaphthalene	2.58	0.333	mg/kg wet	3.333		77	40-140	16	30	
2-Chlorophenol	2.60	0.333	mg/kg wet	3.333		78	30-130	16	30	
2-Methylnaphthalene	2.53	0.333	mg/kg wet	3.333		76	40-140	17	30	
2-Methylphenol	2.58	0.333	mg/kg wet	3.333		78	30-130	14	30	
2-Nitrophenol	2.56	0.333	mg/kg wet	3.333		77	30-130	19	30	
3,3'-Dichlorobenzidine	2.08	0.667	mg/kg wet	3.333		62	40-140	0.1	30	
3+4-Methylphenol	5.57	0.667	mg/kg wet	6.667		84	30-130	11	30	
4-Bromophenyl-phenylether	2.90	0.333	mg/kg wet	3.333		87	40-140	5	30	
4-Chloroaniline	2.35	0.667	mg/kg wet	3.333		71	40-140	13	30	
4-Nitrophenol	2.83	1.67	mg/kg wet	3.333		85	30-130	9	30	
Acenaphthene	2.78	0.333	mg/kg wet	3.333		83	40-140	12	30	
Acenaphthylene	2.84	0.333	mg/kg wet	3.333		85	40-140	12	30	
Acetophenone	2.64	0.667	mg/kg wet	3.333		79	40-140	15	30	
Aniline	1.98	1.67	mg/kg wet	3.333		59	40-140	14	30	
Anthracene	2.87	0.333	mg/kg wet	3.333		86	40-140	4	30	
Azobenzene	2.68	0.333	mg/kg wet	3.333		80	40-140	5	30	
Benzo(a)anthracene	2.85	0.333	mg/kg wet	3.333		86	40-140	3	30	
Benzo(a)pyrene	2.99	0.167	mg/kg wet	3.333		90	40-140	4	30	
Benzo(b)fluoranthene	2.85	0.333	mg/kg wet	3.333		86	40-140	1	30	
Benzo(g,h,i)perylene	2.97	0.333	mg/kg wet	3.333		89	40-140	4	30	
Benzo(k)fluoranthene	3.00	0.333	mg/kg wet	3.333		90	40-140	12	30	
bis(2-Chloroethoxy)methane	2.66	0.333	mg/kg wet	3.333		80	40-140	17	30	
bis(2-Chloroethyl)ether	2.61	0.333	mg/kg wet	3.333		78	40-140	18	30	
bis(2-chloroisopropyl)Ether	2.54	0.333	mg/kg wet	3.333		76	40-140	16	30	
bis(2-Ethylhexyl)phthalate	3.19	0.333	mg/kg wet	3.333		96	40-140	1	30	
Butylbenzylphthalate	3.04	0.333	mg/kg wet	3.333		91	40-140	1	30	
Chrysene	2.85	0.167	mg/kg wet	3.333		86	40-140	3	30	
Dibenzo(a,h)Anthracene	3.00	0.167	mg/kg wet	3.333		90	40-140	4	30	
Dibenzofuran	2.74	0.333	mg/kg wet	3.333		82	40-140	10	30	
Diethylphthalate	2.95	0.333	mg/kg wet	3.333		89	40-140	7	30	
Dimethylphthalate	2.89	0.333	mg/kg wet	3.333		87	40-140	7	30	
Di-n-butylphthalate	3.14	0.333	mg/kg wet	3.333		94	40-140	4	30	
Di-n-octylphthalate	2.84	0.333	mg/kg wet	3.333		85	40-140	6	30	
Fluoranthene	2.97	0.333	mg/kg wet	3.333		89	40-140	5	30	
Fluorene	2.81	0.333	mg/kg wet	3.333		84	40-140	9	30	
Hexachlorobenzene	2.72	0.333	mg/kg wet	3.333		81	40-140	4	30	
Hexachlorobutadiene	2.74	0.333	mg/kg wet	3.333		82	40-140	22	30	
Hexachloroethane	2.55	0.333	mg/kg wet	3.333		76	40-140	20	30	
Indeno(1,2,3-cd)Pyrene	3.01	0.333	mg/kg wet	3.333		90	40-140	4	30	
Isophorone	2.58	0.333	mg/kg wet	3.333		77	40-140	16	30	
Naphthalene	2.75	0.333	mg/kg wet	3.333		82	40-140	19	30	
Nitrobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140	19	30	
N-Nitrosodimethylamine	2.08	0.333	mg/kg wet	3.333		62	40-140	16	30	
Pentachlorophenol	2.84	1.67	mg/kg wet	3.333		85	30-130	7	30	
Phenanthrene	2.80	0.333	mg/kg wet	3.333		84	40-140	5	30	



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
 Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

8270D Semi-Volatile Organic Compounds

Batch CD61837 - 3546

Phenol	2.59	0.333	mg/kg wet	3.333		78	30-130	14	30	
Pyrene	2.77	0.333	mg/kg wet	3.333		83	40-140	2	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.58		mg/kg wet	3.333		77	30-130			
Surrogate: 2,4,6-Tribromophenol	4.26		mg/kg wet	5.000		85	30-130			
Surrogate: 2-Chlorophenol-d4	4.01		mg/kg wet	5.000		80	30-130			
Surrogate: 2-Fluorobiphenyl	2.74		mg/kg wet	3.333		82	30-130			
Surrogate: 2-Fluorophenol	3.91		mg/kg wet	5.000		78	30-130			
Surrogate: Nitrobenzene-d5	2.66		mg/kg wet	3.333		80	30-130			
Surrogate: Phenol-d6	3.99		mg/kg wet	5.000		80	30-130			
Surrogate: p-Terphenyl-d14	2.88		mg/kg wet	3.333		86	30-130			



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

Notes and Definitions

- U Analyte included in the analysis, but not detected
- SD Surrogate recovery(ies) diluted below the MRL (SD).
- S- Surrogate recovery(ies) below lower control limit (S-).
- Q Calibration required quadratic regression (Q).
- D Diluted.
- CD+ Continuing Calibration %Diff/Drift is above control limit (CD+).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report



CERTIFICATE OF ANALYSIS

Client Name: Nover-Armstrong Associates, Inc.
Client Project ID: Chelsea

ESS Laboratory Work Order: 1604433

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/documents/AllLabs.xls>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

http://www.depweb.state.pa.us/portal/server.pt/community/labs/13780/laboratory_accreditation_program/590095

ESS Laboratory Sample and Cooler Receipt Checklist

Client: Nover-Armstrong Associates, Inc. - TB/MM

ESS Project ID: 1604433

Date Received: 4/15/2016

Project Due Date: 4/22/2016

Days for Project: 5 Day

Shipped/Delivered Via: ESS Courier

1. Air bill manifest present? No
Air No.: NA

6. Does COC match bottles? Yes

2. Were custody seals present? No

7. Is COC complete and correct? Yes

3. Is radiation count <100 CPM? Yes

8. Were samples received intact? Yes

4. Is a Cooler Present? Yes
Temp: 3.1 Iced with: Ice

9. Were labs informed about short holds & rushes? Yes / No / NA

5. Was COC signed and dated by client? Yes

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
ESS Sample IDs: _____
Analysis: _____
TAT: _____

12. Were VOAs received? Yes / No
a. Air bubbles in aqueous VOAs? Yes / No
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
a. ~~If metals~~ preserved upon receipt: MeOH Date: 4-18-16 Time: 1600
b. Low Level VOAs brought to freezer: _____ Date: _____ Time: _____

By: JOHN L. PA
By: _____

Sample Receiving Notes:

MeOH VIAL PRESERVED w SR # 4-18-16

14. Was there a need to contact Project Manager? Yes / No
a. Was there a need to contact the client? Yes / No
Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	26978	Yes	NA	Yes	Plastic Baggie	NP	
01	27528	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	26977	Yes	NA	Yes	Plastic Baggie	NP	

2nd Review

Are barcode labels on correct containers? Yes / No

Completed By: [Signature] Date & Time: 4-18-16 1603
Reviewed By: [Signature] Date & Time: 4/18/16 1609

Attachment F

Asbestos Inspector Certification

Commonwealth of Massachusetts
Department of Labor Standards

William D. McKinney, Director

Asbestos Inspector



MATTHEW P. ALGER

Eff. Date 09/25/15

Exp. Date 09/24/16

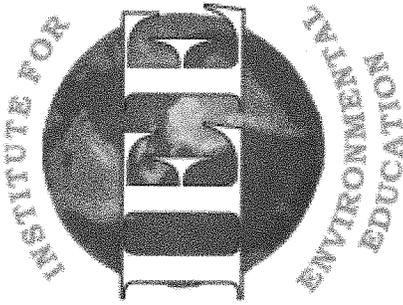
A1900475

Member of C.O.N.E.S.

WB WB - RENEW

16





This is to certify that

Matthew Alger

*has completed the requisite training, and has passed an examination for
reaccreditation as:*

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

Course Location

Institute for Environmental Education, Inc.
16 Upton Drive Wilmington, MA 01887

August 28, 2015

Course Dates

15-0359-106-200362

Certificate Number

August 28, 2015

Examination Date

August 28, 2016

Expiration Date

Training Director

16 Upton Drive, Wilmington, MA 01887

Telephone 978.658.5272

www.ieetrains.com

INSTITUTE FOR ENVIRONMENTAL EDUCATION

Bidder Information Form

Bid for **Roof Replacement, Repair, and Renovation**
John Silber Early Learning Center (ELC)
(To be first page of Bid)

Name of Company:

Address:

Telephone #:

Fax #:

Email Contact:

Is the Company a:

Corporation _____

Partnership _____

Sole Proprietorship _____

Publicly Held _____

Privately Held _____

Names and address of the Principals, Owners, Directors, Officers:

Signature of authorizing party

CITY OF CHELSEA
REQUIRED BID SUBMITTAL FORM

PRICE PROPOSAL FORM

This Response includes addenda number(s) _____.

LUMP SUM BID PRICING - TOTAL BID PRICE:

\$ _____ (words) \$ _____ (figures)

Name of Firm: _____

Address: _____

Phone Number: (_____) - _____

Signature: _____

Print Name: _____ Date: _____

Email Address: _____

The above named firm agrees with the terms and conditions set forth in these Bid Specifications and submits the following rates. The rate shall be inclusive of all charges associated with the provisions of the services.

In conjunction with the words, and figures submitted above for the requisite bid items, and an integral part of said bid submission, the undersigned certifies that:

The undersigned declares that the only persons or parties interested in his/her bid as principals area as stated; that the bid is made without any collusion with other persons, firms, or corporations; that he/she has carefully examined all the Contract Documents and has informed him/herself fully in regard to all conditions pertaining to the work and based on this information, the undersigned makes this bid. These prices shall cover all expenses incurred in performing the work required under the Contract Documents of which this Bid Form is a part.

All bids shall remain open for thirty (30) days, not including Saturdays, Sundays, and legal holidays, after the date of the bid opening.

If a notice of award and three (3) unsigned copies of the Contract (and all other applicable Contract Documents) is delivered to the undersigned within thirty (30) calendar days, not including Saturdays, Sundays, and legal holidays, after the date of

receipt of such notification, he/she shall within five (5) days execute and return all copies of the Contract (and all other applicable Contract Documents) to the City. The premiums for all bonds required shall be paid by the Contractor and shall be included in the contract price. The undersigned further agrees that the bid security accompanying this bid shall become the City's property if the bidder fails to execute the Contract as stated above.

Amounts shall be shown in both words and figures, where indicated. In case of discrepancy, the amount shown in words will govern. The above prices shall include all labor, materials, equipment, supervision, transportation, overhead, profit, insurance, and incidentals required to complete the Work.

The undersigned hereby certifies that s/he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.

Furthermore, pursuant to M.G.L., Chapter 62C, Section 49A, I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid all state taxes required under the law.

The undersigned under penalties of perjury certifies that this bid is in all respects true, accurate, bonafide, fair, and made without collusion or fraud with any other person. As used in this section, the word "person" shall mean any natural person, joint venture partnership, corporation, or other business or legal entity.

Signed this ____ day _____, 2016.

Social Security Number or
Federal Identification Number

Signature of Individual or
Corporate Name

By: _____
Partner of Corporate

CITY OF CHELSEA

REQUIRED BID SUBMITTAL FORM

Certificate of Non-Collusion

The undersigned certifies under the penalties of perjury that this proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this Certification the word “person” shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity or group of individuals.

Signature

Date

Name (Please Print)

Title

Company

Address

Contact Number

CITY OF CHELSEA

REQUIRED BID SUBMITTAL FORM

STATEMENT OF CORPORATE AUTHORITY

REQUIRED (IF CORPORATION) IF A CORPORATION, COMPLTE BELOW OR ATTACH TO EACH SIGNED COPY OF THE BID A NOTORIZED COPY OF VOTE OF CORPORATION AUTHORIZING THE SIGNATORY TO SIGN THIS CONTRACT. IF ATTESTING CLERK IS THE SAME PERSON AS THE INDIVIDUAL EXECUTING THIS CONTRACT, HAVE SIGNATURE NOTORIZED ABOVE.

At a duly authorized meeting of the Board of Directors of _____ held
on _____ Name of Corporation
Date

at which time all voted that _____
Name Officer

of this Company, be and hereby is authorized to execute contracts and bonds in the name and behalf of said Company, and affix its Corporate Seal thereto, and such execution of any contract of obligation in this Company's name on its behalf by such person _____ under seal of the Company, shall be valid and binding upon this company.

A TRUE COPY,

ATTEST: _____
Clerk

PLACE OF BUSINESS: _____

DATE OF THIS BID: _____

I hereby certify that I am the Clerk of the _____

_____ and that _____ is

duly elected _____ of said Company, and that the above vote has not been amended or rescinded and remains in full force and effect as of the date of this contract.

(Clerk's Signature)

(CORPORATE SEAL)

On this _____ day of _____, 2016, before me, the undersigned notary public, personally appeared _____, proved to me through satisfactory evidence of identification, which were _____ to be the person whose name is signed on the preceding or attached document in my presence.

Notary Public - My Commission Expires:

CITY OF CHELSEA

REQUIRED BID SUBMITTAL FORM

WAGE THEFT CERTIFICATION

Pursuant to M.G.L. c. 149, M.G.L. c. 151, I certify under penalties of perjury that, neither this Company nor any of its subcontractors have been subject to a federal or state criminal or civil judgment, administrative citation, final administrative determination, order or debarment resulting from a violation of M.G.L. c. 149, M.G.L. c. 151, the Fair Labor Standards Act or any other state or federal laws regulating the payment of wages within three (3) years prior to the date of the Contract.

Or I certify that this Company has provided copies of any and all of the above to the City prior to the date of the Contract and any required wage bond or insurance; and certifies that while the Contract is in effect, it will report any instance of the above to the City within five (5) days of the Contractor's receipt.

Signature

Social Security or Federal ID No.

Date

BIDDERS/RESPONDENTS MUST SUBMIT THIS FORM FULLY COMPLETED

CITY OF CHELSEA
REQUIRED BID SUBMITTAL FORM

REFERENCE FORM

Bidder: _____

Title of Bid: **Roof Replacement, Repair, and Renovation John Silber Early Learning Center (ELC)**

Bidder must provide references for:

All contracts performed within the past five years of similar size and scope to this contract

- Reference: _____
- Address: _____
- Contact: _____
- Phone: _____
- Fax: _____
- Description and date(s) of services provided:

- Reference: _____
- Address: _____
- Contact: _____
- Phone: _____
- Fax: _____
- Description and date(s) of services provided:

- Reference: _____
- Address: _____
- Contact: _____
- Phone: _____
- Fax: _____
- Description and date(s) of services provided:

CITY OF CHELSEA

REQUIRED BID SUBMITTAL FORM

OSHA COMPLIANCE CERTIFICATION

Any person submitting a bid for, signing a contract to work on, the construction, reconstruction, alteration, remodeling or repair of any building or public works project undertaken by a public awarding authority in Massachusetts and estimated to cost more than \$10,000 must certify on the bid or contract, under penalties of perjury, as follows:

1. That he is able to furnish labor than can work in harmony with all other elements of labor employed or to be employed at the work
2. All employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and
3. That all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration. (MGL. c. 30, Section 39S (a))

Pursuant to M.G.L. c. 30, Section 39M and M.G.L. c. 149, I certify under penalties of perjury that, to the best of my Knowledge and belief, I am in compliance with the OSHA requirements as stated above.

Dated _____

Name of Company or Corporation

Authorized Official's Signature

BIDDERS/RESPONDENTS MUST SUBMIT THIS FORM FULLY COMPLETED

**CITY OF CHELSEA
CONTRACT FOR SERVICES
over \$10,000**

This agreement (the "Agreement") is made and entered into by and between the City of Chelsea (hereinafter the CITY), a municipal corporation organized and existing under the laws of the Commonwealth of Massachusetts, and

[NAME]
[ADDRESS]
(hereinafter the CONTRACTOR)

For mutual consideration the Parties hereby agree as follows:

ARTICLE 1. DEFINITION.

This CONTRACT as used herein shall consist of this Agreement, and the "contract documents" which include but are not limited to the following identified items and all documents, and forms submitted therewith, or attached hereby.

- Attachment A: Scope of Services, and/or other bid package materials
- Attachment B: Additional Contract Terms and Conditions
- Attachment C: Certificate of Non-Collusion, Tax Compliance Certification, Statement of Corporate Authority
- Attachment D: Summaries of Laws Regarding State Ethics - Acknowledgment of Receipt
- Addenda through #

ARTICLE II. AMOUNT AND TERM.

Pursuant to the terms and conditions stated in the Contract, this CITY agrees to pay an amount not to exceed \$ _____, and the Contractor agrees to perform the services detailed in the Contract. The Contract shall commence on or about _____ (the "Commencing Date") unless earlier terminated pursuant to Article IV, Termination and shall terminate no later than _____, unless a written amendment to renew or extend this contract is executed in accordance with the provisions of this CONTRACT.

ARTICLE III. PERFORMANCE.

The Contractor agrees to provide all goods and/or services set forth in the Invitation for Bid/Request for Proposal Documents, Scope of Service, the Contractor's proposal for " _____ ", and/or as outlined in ATTACHMENT A - SCOPE OF SERVICES.

ARTICLE IV. TERMINATION.

i) Without Cause. The CITY may terminate this CONTRACT on sixty (60) calendar day's notice, or may suspend this CONTRACT for up to sixty (60) calendar days upon receipt of notice, when in the best interests of the CITY, by providing notice to the CONTRACTOR, which shall be in writing and shall be deemed delivered and received when given in person to the CONTRACTOR, or when received by fax, express mail, certified mail return receipt requested,

regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CONTRACTOR.

ii) For Cause. If the CONTRACTOR is determined by the CITY to be in default of any term or condition of CONTRACT, the CITY may terminate this contract on thirty (30) day's notice by providing notice to the CONTRACTOR, which shall be in writing and shall be deemed delivered and received when given in person to the CONTRACTOR, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CONTRACTOR. If the CITY is determined by the CONTRACTOR to be in default of any term or condition of this CONTRACT the CONTRACTOR may terminate this contract on thirty (30) day's notice by providing notice to the CITY, which shall be in writing and shall be deemed delivered and received when given in person to the CITY, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CITY.

iii) Default. Events of default under this CONTRACT shall include, but are not limited to the following: a) any material misrepresentation made by the CONTRACTOR to the CITY, b) any failure to perform any of its obligations under this CONTRACT including, but not limited to the following: (i) failure to commence performance of this CONTRACT at the time specified in this CONTRACT due to a reason or circumstance within the CONTRACTOR'S reasonable control, (ii) failure to perform this CONTRACT with sufficient personnel and equipment or with sufficient material to ensure the completion of this CONTRACT within the specified time due to a reason or circumstance within the CONTRACTOR'S reasonable control, (iii) failure to perform this CONTRACT in a manner reasonably satisfactory to the CITY, (iv) failure to promptly re-perform with reasonable time the services that were rejected by the CITY as unsatisfactory, or erroneous, (v) discontinuance of the services for reasons not beyond the CONTRACTOR'S reasonable control, (vi) failure to comply with a material term of this CONTRACT, including, but not limited to, the provision of insurance or failure to comply with nondiscrimination provisions, and (vii) any other acts specifically and expressly stated in this CONTRACT as constituting a basis for termination of this CONTRACT, and (viii) failure to comply with any and all requirements of state law, and/or regulations, and City ordinances, and/or regulations.

ARTICLE V. REMEDIES OF THE CITY.

The City hereby retains all remedies in law and equity, including but not limited to, the right to deduct the cost of any substitute contract or performance for expenses, losses, and all damages and the right to withhold from payment, any amounts for expenses, losses, and damages from sums due, or which become due.

ARTICLE VI. REMEDIES OF THE CONTRACTOR.

If the Contractor, due to any act or omission for which the City is legally responsible, sustains damages, other than loss, non-conformance, or non-performance, the Contractor may request, within 30 days of the alleged act or omission from the City, a sum equal to the amount of such damages sustained by the Contractor, which amount may be determined by the City in writing, at the City 's sole discretion, provided that the Contractor has provided to all signatories of this Agreement, a detailed, written statement of such damages and cause thereof within said 30 day period.

ARTICLE VII. ASSIGNABILITY.

The CONTRACTOR shall not assign, subcontract or in any way transfer any interest, rights or obligations in this CONTRACT without the prior written consent of the City Manager. In the

event of such assignment the CITY reserves the right to deal with any assignee subcontractor or transferee directly and the CONTRACTOR agrees to remain bound by all terms and conditions of this CONTRACT in accordance with its original tenor and in no way shall the CONTRACTOR be relieved of its responsibilities and obligations under this CONTRACT. The provisions of this CONTRACT shall be binding upon, and shall inure to the benefit of, the successors and assigns of the CONTRACTOR and any public body or bodies succeeding the interests of the CITY.

ARTICLE VIII. INDEMNIFICATION.

The CONTRACTOR shall assume the defense, indemnify and hold harmless the CITY, the CITY'S agents and employees, from and against all losses and all claims, demands, payments, suits, actions, recoveries and judgments of every nature and description brought or recovered against them by reason of acts, in actions, omissions, negligence, reckless or intentional misconduct of the said CONTRACTOR, its agent(s), officers, employees, or subcontractors; in the execution of the work or in guarding the same. Unless otherwise provided by law, the CITY may elect, at its sole discretion, to indemnify the CONTRACTOR for claims arising in tort if it is determined that the CONTRACTOR performed its obligations under this CONTRACT pursuant to the direct supervision and control of the CITY or its designated agent(s).

ARTICLE IX. WORKER'S COMPENSATION AND OTHER INSURANCE.

The CONTRACTOR shall provide insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws of Massachusetts (The Worker's Compensation Act) to all employees of the CONTRACTOR who are subject to the provisions of Chapter 152 of the General Laws of Massachusetts.

Failure to provide and continue in force such insurance during the period of this contract shall be deemed a material breach of this contract, shall operate as an immediate termination thereof, and CONTRACTOR shall indemnify the CITY for all losses, claims, and actions resulting from the failure to provide the insurance required by this Article.

The Contractor shall furnish to the CITY evidence of such insurance prior to the execution of this contract and before the same shall be binding on the parties thereto, except if specifically waived in Attachment B.

Prior to commencement of any work and until completion of its work under this CONTRACT, the CONTRACTOR shall maintain the following insurance coverage, at its cost, from insurance acceptable to the CITY, giving evidence of such coverage to the CITY prior to execution of this CONTRACT, a copy of such insurance coverage to be attached herewith:

1. Comprehensive Automobile Liability Insurance covering the use of all owned, non-owned and hired automobiles in connection with its operations with a combined single limit of \$1,000,000. The comprehensive Automobile Liability insurance may be provided through primary and excess or umbrella insurance policies.
2. CONTRACTOR'S Equipment Coverage (or a certification of self-insurance satisfactory to the CITY) must be provided on an "All Risks" basis, covering physical damage to all tools and equipment, including automotive equipment owned, rented, or used by the CONTRACTOR.
3. Commercial General Liability Insurance coverage which may be provided through primary and excess or umbrella liability policies for limits of \$1,000,000 general aggregate, and \$500,000 per occurrence.

All required insurance must be endorsed to name the CITY as Additional Insured. All required insurance shall be endorsed to waive the insurer's rights of subrogation against the City. All policies and certificates of insurance must contain language that the insurance shall not be canceled, materially changed or non-renewed without at least thirty (30) days advance written notice to the CITY. The CONTRACTOR under this CONTRACT shall not allow its subcontractors to begin work until similar insurance has been so obtained and certificates of insurance approved by the CONTRACTOR.

ARTICLE X. CORPORATE CONTRACTOR.

If CONTRACTOR is a corporation, CONTRACTOR shall endorse the Certificate of Corporate Authority for the CONTRACTORS' signatory (Exhibit C), or shall otherwise provide a form similar in nature and substance acceptable to the CITY at the City's sole discretion.

If CONTRACTOR is a non-profit corporation, CONTRACTOR shall provide satisfactory proof of present status as a non-profit corporation. Such proof shall be in the form of a certification from the Massachusetts Secretary of State's office and/or from the Internal Revenue Service and shall provide the Federal Tax Identification Number of the non-profit corporation. This CONTRACT shall not be enforceable against the CITY unless and until the CONTRACTOR complies with this Article. Failure to inform the CITY in writing of revocation, or other loss of non-profit status shall be deemed a material breach of this contract and operate as an immediate termination thereof.

ARTICLE XI. SUBJECT TO APPROPRIATION.

The obligations of the CITY under this CONTRACT shall be subject to appropriation. In the absence of appropriation this CONTRACT shall be immediately terminated without liability for damages, penalties, or other charges.

In the event any portion of this Agreement is to be funded with alternate funding including but not limited to state, local, federal or private grant funding. In the requisite circumstances, the obligations of the CITY under this CONTRACT shall be subject to the formal award of such state, local, federal or private grant.

ARTICLE XII. DOCUMENTS, MATERIALS, ETC.

Any materials, reports, information, data, etc. given to or prepared or assembled by the CONTRACTOR under this CONTRACT are to be kept confidential and shall not be made available to any individual or organization by the CONTRACTOR (except agents, servants, or employees of the CONTRACTOR) without the prior written approval of the CITY. The CONTRACTOR understands that he/she/it may acquire or have access to "personal data" otherwise kept by the CITY. The CONTRACTOR shall comply with the provisions Chapter 66A of the General Laws of Massachusetts as it relates to public documents, and all other state and federal laws and regulations relating to confidentiality, security, privacy and use of confidential data.

Any materials produced in whole or in part under this CONTRACT shall not be subject to copyright, except by the CITY, in the United States or any other country. The CITY shall have unrestricted authority to, without payment of any royalty, commission, or additional fee of any type or nature, publicly disclose, reproduce, distribute and otherwise use, and authorize other to use, in whole or in part, any reports, data or other materials prepared under this CONTRACT.

All data, reports, programs, software, equipment, furnishings, and any other documentation or product paid for by the CITY shall vest in the CITY at the termination of this CONTRACT. The CONTRACTOR shall at all times, during or after termination of this CONTRACT, obtain the

prior written approval of the CITY before making any statement bearing on the work performed or data collected under this CONTRACT to the press or issues any material for publication through any medium.

ARTICLE XIII. AUDIT, INSPECTION, RECORDKEEPING.

At any time during normal business hours, and as often as the CITY may deem it reasonably necessary, there shall be made available in the office of the CONTRACTOR for the purpose of audit, examination, and/or to make excerpts or transcripts, all records, contracts, invoices, materials, payrolls, records of personnel, conditions of employment and other data relating to all matters covered by this agreement.

Further the CONTRACTOR agrees to make its work papers, records and other evidence of audit available to the CITY for a period of three years after final payment under his CONTRACT. The CITY shall be entitled to reproduce any or all such documents at its own expense, for which provision shall be made at such time.

ARTICLE XIV. WEEKLY PAYROLL RECORDS REPORT.

In accordance with Massachusetts General Law c. 149, s. 27B, a true and accurate record must be kept of all individuals employed on a public works construction project for which prevailing wage rates are applicable.

In addition, every contractor and subcontractor is required to submit, on a weekly basis, a copy of their weekly payroll records to the awarding authority. Once collected, the awarding authority is also required to preserve those records for three years.

ARTICLE XV. CONFLICT OF INTEREST.

- i) CITY. No officer, member or employee of the CITY and no members of its governing body who exercise any function or responsibility in review or approval of the undertaking or carrying out of this CONTRACT shall participate in any decision relating to the CONTRACT which affects his/her personal interests or the interest of any corporation, partnership, or association in which he/she has a direct or indirect pecuniary interest. None of the services to be provided by the CONTRACTOR shall be used for any partisan political activity or further the election or defeat of any candidate for political office in the CITY. Compliance with this section shall be material to the CONTRACT.

- ii) CONTRACTOR. CONTRACTOR agrees that his/her/its agents, servants, and employees have neither presently nor during the period of this CONTRACT any interest direct or indirect which would impair, detract, or conflict in any manner or degree with the performance of services required under this CONTRACT. The CONTRACTOR, his/her/its agents, servants and employees further stipulate that in the performance of this CONTRACT, no person having any such interest shall be employed. Conflicts of Interest include but are not limited to (a) immediate family relationships with officials of the CITY, (b) instances where the CONTRACTOR, his/her/its agents, servants or employees during the period of this CONTRACT was connected as an officer, employee or member of the governing body of the CITY, and (c) instances where the CONTRACTOR has an interest in any CITY department, its agents, servants or employees or parcels of land within the CITY. Compliance with this section shall be material to the CONTRACT. The CONTRACTOR, his/her/its agents, servants and employees must disclose any and all such interests in writing to the CITY.

ARTICLE XVI. PAYMENT.

The City agrees to make all reasonable efforts to pay to the CONTRACTOR the sum set forth any invoice which has been approved by the City Manager or his authorized designee within thirty (30) days of receipt of such invoice at the Office of the City Auditor. Each invoice shall detail the work completed.

Subject to pending statutory appeal rights, the City hereby reserves the right and the CONTRACTOR hereby agrees that the City may deduct from the sum(s) otherwise payable under this CONTRACT any outstanding taxes, fines, fees and/or other municipal charges prior to disbursement to the CONTRACTOR.

ARTICLE XVII. CONFLICT.

In the event there is a conflict between these Articles and Attachment A, Attachment A shall supersede these Articles.

ARTICLE XVIII. WAIVER AND AMENDMENT.

The provisions contained in this CONTRACT may be modified only by the express written consent of the Parties. Any amendments, must be made only by written amendment executed by all signatories to the original agreement, prior to the effective date of the amendment.

The failure of any party to insist on the strict performance of any term, covenant or condition to this CONTRACT, at anytime, or in any one or more instances, or its failure to take advantage of any of its rights, or any course of conduct or dealing, shall not be construed as a waiver or a relinquishment of any such rights or conditions at any future time and shall, in no way act, as a wavier by any party of a breach of another party or have any affect on the continuance of or the full force and affect of any or all of the provisions of this Contract. The waiver of any provisions must be in writing and executed by all signatories to this Agreement prior to the force and effect of any such waiver.

Forbearance or indulgence in any form or manner by a party shall not be construed as a waiver, nor in any manner limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach shall constitute a waiver of any subsequent default or breach of a similar or different matter.

ARTICLE XIX. CERTIFICATION.

IN WITNESS WHEREOF, THE CONTRACTOR CERTIFIES, UNDER THE PAINS AND PENALTIES OF PERJURY, THAT THE CONTRACTOR IS IN COMPLIANCE WITH EACH OF THE FOLLOWING:

- a. TAXES. PURSUANT to M.G.L. c. 62C, s. 49A, the CONTRACTOR has filed all state tax returns and complied with all laws of the Commonwealth relating to taxes.
- b. DEBARMENT. The CONTRACTOR is not currently debarred or suspended by the Commonwealth of Massachusetts, or any of its entities or subdivisions.
- c. AMERICANS WITH DISABILITIES ACT. The CONTRACTOR is aware of the Americans with Disabilities Act which prohibits discrimination based upon disability and shall meet any relevant standards, and/or conditions set out in the bid/proposal documents, bid/proposal specifications, and/or ATTACHMENT A - SCOPE OF SERVICES.

ARTICLE XX. FORUM AND CHOICE OF LAW

This CONTRACT and any performance herein shall be governed by and be construed in accordance with the laws of Commonwealth of Massachusetts, exclusive of its conflicts of law provisions. Any and all proceedings or actions relating to subject matter herein shall be brought and maintained in the courts of the Commonwealth of Massachusetts or the federal district court sitting in the Commonwealth of Massachusetts, which shall have exclusive jurisdiction thereof. Each of the Parties hereto irrevocably consents to and waives any objection to the exercise of personal jurisdiction by the state and federal courts of the Commonwealth of Massachusetts. This paragraph shall not be construed to limit any other legal rights of the parties.

ARTICLE XXI. TAXES

CONTRACTOR shall be solely responsible for the payment of any taxes, levies, betterments or assessments, fees or charges, whether in existence on the date hereof or becoming applicable pursuant to this Contract, which may be assessed against the CONTRACTOR or the CITY which are directly attributable to CONTRACTOR'S activities under this CONTRACT (the "Taxes"). CONTRACTOR shall pay all Taxes directly to the taxing authority before delinquency and before any fine, interest or penalty shall become due or be imposed by operation of law for their nonpayment.

ARTICLE XXII. NOTICES

All notices, demands, requests, consents, approvals and other instruments required or permitted to be given pursuant to the terms hereof (hereinafter "Notice"), shall be in writing and shall be deemed to have been properly given when delivered in hand or deposited in registered or certified United States mail, postage prepaid, return receipt requested, addressed, as described herein or when delivered by messenger or overnight mail service to the correct addressee. Unless otherwise specified, Notice shall be deemed received when actually received or when the proffered Notice has been refused by the Addressee. The signature of an employee, servant or agent of the Addressee shall be determinative on the issue of actual receipt.

All notices shall be sent to the persons and addresses listed below. CONTRACTOR and the CITY shall, at any time and from time to time, have the right to specify as their proper addresses for purposes of this CONTRACT any other address or addresses giving fifteen (15) days' written notice thereof to the other party.

All Notices shall be forwarded to:

FOR THE CITY
Edward Keefe, Acting City Manager
500 Broadway
City Hall
Chelsea, MA 02150

With a Copy to:
Cheryl Anne Watson
City Solicitor
Law Department, Room 307
500 Broadway
Chelsea, MA 02150

FOR THE CONTRACTOR:
[NAME]
[ADDRESS]

ARTICLE XXIII. CONSIDERATION

The Parties mutually agree to enter into this CONTRACT for good and valuable consideration.

ARTICLE XXIV. REPRESENTATIONS AND WARRANTIES OF THE CONTRACTOR

The CONTRACTOR represents and warrants (i) the CONTRACTOR has all requisite corporate power and authority to enter into this CONTRACT and to perform the obligations of the CONTRACTOR; (ii) that this CONTRACT has been duly and validly authorized, executed and delivered by the CONTRACTOR; (iii) the execution and delivery of this CONTRACT does not violate or conflict with any other agreement, license or obligation; (iv) the CONTRACTOR is duly organized, legal and validly existing and in good standing in the Commonwealth of Massachusetts; (v) that the CONTRACTOR is duly qualified and authorized to do business in the Commonwealth of Massachusetts; (vi) the CONTRACTOR is in compliance and is current with any payments under all federal, state and local tax laws; (vii) the CONTRACTOR will obtain any and all permits which may be necessary to perform the obligations of this CONTRACT; (viii) the CONTRACTOR will timely perform its obligations required by this CONTRACT.

ARTICLE XXV. THIRD PARTY BENEFICIARIES

This CONTRACT shall not be construed to create any third party beneficiary rights in favor of any other parties or any right or privilege for the benefit of any other parties.

ARTICLE XXVI. ENTIRE CONTRACT

This CONTRACT constitutes the entire Agreement of the parties hereto with respect to the subject matter hereof, and no representations, inducements, promises, or agreements, oral or otherwise, between the parties hereto with respect to the subject matter hereof not embodied herein shall be of any force or effect.

ARTICLE XXVII. LIABILITY OF MUNICIPALITY

The CITY shall not be liable to CONTRACTOR for any loss of business or any indirect, incidental, special, consequential or exemplary damages or lost profits unless expressly specified herein.

ARTICLE XXVIII. HEADINGS

Heading used in this Agreement are for convenience of reference only and shall not be construed as altering the meaning of this CONTRACT or any of its provisions.

ARTICLE XXIX. DAYS

Any reference to "days" in this CONTRACT, shall be deemed to mean business days (Monday through Friday, excluding generally recognized holidays) except where specific reference is made to calendar days.

ARTICLE XXX. SURVIVAL

The parties agree that the provisions of ARTICLE II – AMOUNT AND TERM; ARTICLE III – PERFORMANCE; ARTICLE V- REMEDIES OF THE CITY; ARTICLE VI- REMEDIES OF THE CONTRACTOR. ARTICLE VII – ASSIGNABILITY; ARTICLE VIII – INDEMNIFICATION; ARTICLE IX- WORKER’S COMPENSATION AND OTHER INSURANCE; ARTICLE XI-SUBJECT TO APPROPRIATION; ARTICLE XII – DOCUMENTS, MATERIALS, ETC; ARTICLE XIII – AUDIT, INSPECTION, RECORDKEEPING; ARTICLE XIV- WEEKLY PAYROLL RECORDS REPORT; ARTICLE XVI – PAYMENT; ARTICLE XVIII – WAIVER AND AMENDMENT; ARTICLE XIX – CERTIFICATION; ARTICLE XX- FORUM AND CHOICE OF LAW; ARTICLE XXI –

TAXES; ARTICLE XXIV- REPRESENTATIONS AND WARRANTIES OF THE CONTRACTOR; ARTICLE XXVII- LIABILITY OF THE MUNICIPALITY; ARTICLE XXX – SURVIVAL; and ARTICLE XXXI - SEVERABILITY shall survive the expiration or any earlier termination of this CONTRACT.

ARTICLE XXXI. SEVERABILITY

If any provision of this CONTRACT is held to be illegal, invalid or unenforceable, the remaining terms shall not be affected and shall remain in full force and effect. The Agreement shall be interpreted as if the illegal, invalid or unenforceable provision had not been included in it and the invalid or unenforceable provision shall be stricken and shall be replaced by a mutually acceptable provision which being valid and enforceable comes closest to the intention of the parties with respect to the invalid or unenforceable provision.

ARTICLE XXXII. ADVICE AND COUNSEL

The CONTRACTOR hereby acknowledges and agrees that CONTRACTOR has read this Agreement in its entirety and that CONTRACTOR has had the opportunity to consult legal and financial advisors of their choosing regarding the execution, delivery and performance of their obligations, hereunder.

ARTICLE XXXIII. COUNTERPARTS

This CONTRACT may be executed in counterpart.

THE REMAINDER OF THIS PAGE LEFT INTENTIONALLY BLANK

IN WITNESS WHEREOF the parties have hereto and to three other identical instruments set forth their hands the day and year first above written.

THE CONTRACTOR

CITY MANAGER

Company Name

Thomas G. Ambrosino, City Manager

Status (Corporation/Non-corporate)

Signature & Title

Please Print Name & Title

Dylan Cook
Chief Procurement Officer

Date

Taxpayer Identification Number

APPROVED AS TO FORM:

Cheryl Watson Fisher
City Solicitor

Approved as to Contract Manager:

I CERTIFY THAT FUNDS HAVE BEEN
ENCUMBERED IN THE AMOUNT OF
\$_____ FOR THIS CONTRACT
Appropriation Number:

Mary M. Bourque, Superintendent
Chelsea Public Schools
City of Chelsea

Edward M. Dunn
City Auditor

ATTACHMENT A

SCOPE OF SERVICES

INSTRUCTIONS FOR DEPARTMENT AND CONTRACTOR: Please attach for reference purposes a copy of all bid/proposal documents, including but not limited to (i) invitations/instructions for bidders (ii) invitation/instructions for proposers, (iii) general and specific conditions, and please provide a detailed description of all types of goods and/or services that will be provided pursuant to this CONTRACT, not otherwise provided in any bid/proposal instructions, specifications, conditions or other documents.

ATTACHMENT B

ADDITIONAL CONTRACT TERMS AND CONDITIONS

INSTRUCTIONS FOR DEPARTMENTS: Please specify any additions or modifications to the terms and conditions (not to conflict with the public procurement laws or City ordinances or regulations:

ATTACHMENT C

CERTIFICATE OF NON-COLLUSION

TAX COMPLIANCE CERTIFICATION

STATEMENT OF CORPORATE AUTHORITY

CERTIFICATE OF NON-COLLUSION
MANDATORY

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Dated: _____

Name of Company or Corporation

Authorized Official's Signature

BIDDERS/RESPONDENTS MUST SUBMIT THIS FORM FULLY COMPLETED.

TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c. 62C, Section 49A, I certify under penalties of perjury that I, to my best knowledge and belief, have filed all Massachusetts tax returns and paid all Massachusetts taxes required under law, as well as paid all contributions and payments in lieu of contributions pursuant to M.G.L., c. 151A, Section 19A(b).

I further certify that I have complied with all federal, state and local laws relating to taxes, including but not limited to the withholding and reporting of any income taxes for employees and contractors, and the withholding and remittance of child support.

Signature

Social Security or Federal ID No.

Date

BIDDERS/RESPONDENTS MUST SUBMIT THIS FORM FULLY COMPLETED.

STATEMENT OF CORPORATE AUTHORITY

At a duly authorized meeting of the Board of Directors of _____

held on _____ at which time all voted that _____

of this Company, be and hereby is authorized to execute contracts and bonds in the name and on behalf of said Company, and affix its Corporate seal thereto, and such execution of any contract

of obligation in this Company's name on its behalf by such person _____ under seal of the Company, shall be valid and binding upon this Company.

A TRUE COPY,
ATTEST:

PLACE OF BUSINESS:

DATE OF THIS CONTRACT:

I hereby certify that I am Clerk of _____ and that

_____ is duly elected _____

of said Company, and that the above vote has not been amended or rescinded and remains in full force and effect as of the date of this contract.

(Clerk's Signature)

(CORPORATE SEAL)

ATTACHMENT D

City of Chelsea
Conflict of Interest Law
Compliance Statement and Requirements for Vendors

On July 1, 2009, the Legislature enacted Chapter 28 of the Acts of 2009 which made changes to Mass. General Laws c. 268A and c. 268B, the Massachusetts' Conflict of Interest Law. On November 9, 2009, the Chelsea City Council designated the Chelsea City Solicitor as the Municipal Liaison to the State Ethics Commission and responsible for the facilitation of Chelsea's obligation to comply with the changes in the law.

The City has a requirement for compliance, which is to make sure that all municipal elected officials, board and commission members, and employees **including vendors** are provided copies of the Summaries of the Ethics Laws.

Enclosed is a packet that should be copied and provide to each one of your employees who are assigned to work in Chelsea; including yourself. At the end of the summary is an acknowledgement of receipt of the summary. The acknowledgments must be submitted along with any purchase order or contract with the City of Chelsea. All documents pursuant to this new law will be kept on file in the City Clerk's Office

The Procurement Officer will contact you directly, if there is a determination that you or your staff should undergo the Conflict of Interest Online Training Program.

If you have any questions, feel free to contact the Chelsea City Solicitor at 617-466-4150 as soon as possible.

Summary of the Conflict of Interest Law for Municipal Employees

This summary of the conflict of interest law, General Laws chapter 268A, is intended to help municipal employees understand how that law applies to them. This summary is not a substitute for legal advice, nor does it mention every aspect of the law that may apply in a particular situation. Municipal employees can obtain free confidential advice about the conflict of interest law from the Commission's Legal Division at our website, phone number, and address above. Municipal counsel may also provide advice.

The conflict of interest law seeks to prevent conflicts between private interests and public duties, foster integrity in public service, and promote the public's trust and confidence in that service by placing restrictions on what municipal employees may do on the job, after hours, and after leaving public service, as described below. The sections referenced below are sections of G.L. c. 268A.

When the Commission determines that the conflict of interest law has been violated, it can impose a civil penalty of up to \$10,000 (\$25,000 for bribery cases) for each violation. In addition, the Commission can order the violator to repay any economic advantage he gained by the violation, and to make restitution to injured third parties. Violations of the conflict of interest law can also be prosecuted criminally.

I. Are you a municipal employee for conflict of interest law purposes?

You do not have to be a full-time, paid municipal employee to be considered a municipal employee for conflict of interest purposes. Anyone performing services for a city or town or holding a municipal position, whether paid or unpaid, including full- and part-time municipal employees, elected officials, volunteers, and consultants, is a municipal employee under the conflict of interest law. An employee of a private firm can also be a municipal employee, if the private firm has a contract with the city or town and the employee is a "key employee" under the contract, meaning the town has specifically contracted for her services. The law also covers private parties who engage in impermissible dealings with municipal employees, such as offering bribes or illegal gifts.

II. On-the-job restrictions.

(a) Bribes. Asking for and taking bribes is prohibited. (See Section 2)

A bribe is anything of value corruptly received by a municipal employee in exchange for the employee being influenced in his official actions. Giving, offering, receiving, or asking for a bribe is illegal.

Bribes are more serious than illegal gifts because they involve corrupt intent. In other words, the municipal employee intends to sell his office by agreeing to do or not do some official act, and the giver intends to influence him to do so. Bribes of any value are illegal.

(b) Gifts and gratuities. Asking for or accepting a gift because of your official position, or because of something you can do or have done in your official position, is prohibited. (See Sections 3, 23(b)(2), and 26)

Municipal employees may not accept gifts and gratuities valued at \$50 or more given to influence their official actions or because of their official position. Accepting a gift intended to reward past official action or to bring about future official action is illegal, as is giving such gifts. Accepting a gift given to you because of the municipal position you hold is also illegal. Meals, entertainment event tickets, golf, gift baskets, and payment of travel expenses can all be illegal gifts if given in connection with official action or position, as can anything worth \$50 or more. A number of smaller gifts together worth \$50 or more may also violate these sections.

Example of violation: A town administrator accepts reduced rental payments from developers.

Example of violation: A developer offers a ski trip to a school district employee who oversees the developer's work for the school district.

Regulatory exemptions. There are situations in which a municipal employee's receipt of a gift does not present a genuine risk of a conflict of interest, and may in fact advance the public interest. The Commission has created exemptions permitting giving and receiving gifts in these situations. One commonly used exemption permits municipal employees to accept payment of travel-related expenses when doing so advances a public purpose. Another commonly used exemption permits municipal employees to accept payment of costs involved in attendance at educational and training programs. Other exemptions are listed on the Commission's website.

Example where there is no violation: A fire truck manufacturer offers to pay the travel expenses of a fire chief to a trade show where the chief can examine various kinds of fire-fighting equipment that the town may purchase. The chief fills out a disclosure form and obtains prior approval from his appointing authority.

Example where there is no violation: A town treasurer attends a two-day annual school featuring multiple substantive seminars on issues relevant to treasurers. The annual school is paid for in part by banks that do business with town treasurers. The treasurer is only required to make a disclosure if one of the sponsoring banks has official business before her in the six months before or after the annual school.

(c) Misuse of position. Using your official position to get something you are not entitled to, or to get someone else something they are not entitled to, is prohibited. Causing someone else to do these things is also prohibited. (See Sections 23(b)(2) and 26)

A municipal employee may not use her official position to get something worth \$50 or more that would not be properly available to other similarly situated individuals. Similarly, a municipal employee may not use her official position to get something worth \$50 or more for someone else

that would not be properly available to other similarly situated individuals. Causing someone else to do these things is also prohibited.

Example of violation: A full-time town employee writes a novel on work time, using her office computer, and directing her secretary to proofread the draft.

Example of violation: A city councilor directs subordinates to drive the councilor's wife to and from the grocery store.

Example of violation: A mayor avoids a speeding ticket by asking the police officer who stops him, "Do you know who I am?" and showing his municipal I.D.

(d) Self-dealing and nepotism. Participating as a municipal employee in a matter in which you, your immediate family, your business organization, or your future employer has a financial interest is prohibited. (See Section 19)

A municipal employee may not participate in any particular matter in which he or a member of his immediate family (parents, children, siblings, spouse, and spouse's parents, children, and siblings) has a financial interest. He also may not participate in any particular matter in which a prospective employer, or a business organization of which he is a director, officer, trustee, or employee has a financial interest. Participation includes discussing as well as voting on a matter, and delegating a matter to someone else.

A financial interest may create a conflict of interest whether it is large or small, and positive or negative. In other words, it does not matter if a lot of money is involved or only a little. It also does not matter if you are putting money into your pocket or taking it out. If you, your immediate family, your business, or your employer have or has a financial interest in a matter, you may not participate. The financial interest must be direct and immediate or reasonably foreseeable to create a conflict. Financial interests which are remote, speculative or not sufficiently identifiable do not create conflicts.

Example of violation: A school committee member's wife is a teacher in the town's public schools. The school committee member votes on the budget line item for teachers' salaries.

Example of violation: A member of a town affordable housing committee is also the director of a non-profit housing development corporation. The non-profit makes an application to the committee, and the member/director participates in the discussion.

Example: A planning board member lives next door to property where a developer plans to construct a new building. Because the planning board member owns abutting property, he is presumed to have a financial interest in the matter. He cannot participate unless he provides the

State Ethics Commission with an opinion from a qualified independent appraiser that the new construction will not affect his financial interest.

In many cases, where not otherwise required to participate, a municipal employee may comply with the law by simply not participating in the particular matter in which she has a financial interest. She need not give a reason for not participating.

There are several exemptions to this section of the law. An appointed municipal employee may file a written disclosure about the financial interest with his appointing authority, and seek permission to participate notwithstanding the conflict. The appointing authority may grant written permission if she determines that the financial interest in question is not so substantial that it is likely to affect the integrity of his services to the municipality. Participating without disclosing the financial interest is a violation. Elected employees cannot use the disclosure procedure because they have no appointing authority.

Example where there is no violation : An appointed member of the town zoning advisory committee, which will review and recommend changes to the town's by-laws with regard to a commercial district, is a partner at a company that owns commercial property in the district. Prior to participating in any committee discussions, the member files a disclosure with the zoning board of appeals that appointed him to his position, and that board gives him a written determination authorizing his participation, despite his company's financial interest. There is no violation.

There is also an exemption for both appointed and elected employees where the employee's task is to address a matter of general policy and the employee's financial interest is shared with a substantial portion (generally 10% or more) of the town's population, such as, for instance, a financial interest in real estate tax rates or municipal utility rates.

(e) False claims. Presenting a false claim to your employer for a payment or benefit is prohibited, and causing someone else to do so is also prohibited. (See Sections 23(b)(4) and 26)

A municipal employee may not present a false or fraudulent claim to his employer for any payment or benefit worth \$50 or more, or cause another person to do so.

Example of violation : A public works director directs his secretary to fill out time sheets to show him as present at work on days when he was skiing.

(f) Appearance of conflict. Acting in a manner that would make a reasonable person think you can be improperly influenced is prohibited. (See Section 23(b)(3))

A municipal employee may not act in a manner that would cause a reasonable person to think that she would show favor toward someone or that she can be improperly influenced. Section 23(b)(3) requires a municipal employee to consider whether her relationships and affiliations could prevent her from acting fairly and objectively when she performs her duties for a city or town. If she cannot be fair and objective because of a relationship or affiliation, she should not perform her duties. However, a municipal employee, whether elected or appointed, can avoid violating this provision by making a public disclosure of the facts. An appointed employee must make the disclosure in writing to his appointing official.

Example where there is no violation: A developer who is the cousin of the chair of the conservation commission has filed an application with the commission. A reasonable person could conclude that the chair might favor her cousin. The chair files a written disclosure with her appointing authority explaining her relationship with her cousin prior to the meeting at which the application will be considered. There is no violation of Sec. 23(b)(3).

(g) Confidential information. Improperly disclosing or personally using confidential information obtained through your job is prohibited. (See Section 23(c))

Municipal employees may not improperly disclose confidential information, or make personal use of non-public information they acquired in the course of their official duties to further their personal interests.

III. After-hours restrictions.

(a) Taking a second paid job that conflicts with the duties of your municipal job is prohibited. (See Section 23(b)(1))

A municipal employee may not accept other paid employment if the responsibilities of the second job are incompatible with his or her municipal job.

Example: A police officer may not work as a paid private security guard in the town where he serves because the demands of his private employment would conflict with his duties as a police officer.

(b) Divided loyalties. Receiving pay from anyone other than the city or town to work on a matter involving the city or town is prohibited. Acting as agent or attorney for anyone other

than the city or town in a matter involving the city or town is also prohibited whether or not you are paid. (See Sec. 17)

Because cities and towns are entitled to the undivided loyalty of their employees, a municipal employee may not be paid by other people and organizations in relation to a matter if the city or town has an interest in the matter. In addition, a municipal employee may not act on behalf of other people and organizations or act as an attorney for other people and organizations in which the town has an interest. Acting as agent includes contacting the municipality in person, by phone, or in writing; acting as a liaison; providing documents to the city or town; and serving as spokesman.

A municipal employee may always represent his own personal interests, even before his own municipal agency or board, on the same terms and conditions that other similarly situated members of the public would be allowed to do so. A municipal employee may also apply for building and related permits on behalf of someone else and be paid for doing so, unless he works for the permitting agency, or an agency which regulates the permitting agency.

Example of violation: A full-time health agent submits a septic system plan that she has prepared for a private client to the town's board of health.

Example of violation: A planning board member represents a private client before the board of selectmen on a request that town meeting consider rezoning the client's property.

While many municipal employees earn their livelihood in municipal jobs, some municipal employees volunteer their time to provide services to the town or receive small stipends. Others, such as a private attorney who provides legal services to a town as needed, may serve in a position in which they may have other personal or private employment during normal working hours. In recognition of the need not to unduly restrict the ability of town volunteers and part-time employees to earn a living, the law is less restrictive for "special" municipal employees than for other municipal employees.

The status of "special" municipal employee has to be assigned to a municipal position by vote of the board of selectmen, city council, or similar body. A position is eligible to be designated as "special" if it is unpaid, or if it is part-time and the employee is allowed to have another job during normal working hours, or if the employee was not paid for working more than 800 hours during the preceding 365 days. It is the position that is designated as "special" and not the person or persons holding the position. Selectmen in towns of 10,000 or fewer are automatically "special"; selectman in larger towns cannot be "specials."

If a municipal position has been designated as "special," an employee holding that position may be paid by others, act on behalf of others, and act as attorney for others with respect to matters before municipal boards other than his own, provided that he has not officially participated in the

matter, and the matter is not now, and has not within the past year been, under his official responsibility.

Example: A school committee member who has been designated as a special municipal employee appears before the board of health on behalf of a client of his private law practice, on a matter that he has not participated in or had responsibility for as a school committee member. There is no conflict. However, he may not appear before the school committee, or the school department, on behalf of a client because he has official responsibility for any matter that comes before the school committee. This is still the case even if he has recused himself from participating in the matter in his official capacity.

Example: A member who sits as an alternate on the conservation commission is a special municipal employee. Under town by-laws, he only has official responsibility for matters assigned to him. He may represent a resident who wants to file an application with the conservation commission as long as the matter is not assigned to him and he will not participate in it.

(c) Inside track. Being paid by your city or town, directly or indirectly, under some second arrangement in addition to your job is prohibited, unless an exemption applies. (See Section 20)

A municipal employee generally may not have a financial interest in a municipal contract, including a second municipal job. A municipal employee is also generally prohibited from having an indirect financial interest in a contract that the city or town has with someone else. This provision is intended to prevent municipal employees from having an "inside track" to further financial opportunities.

Example of violation: Legal counsel to the town housing authority becomes the acting executive director of the authority, and is paid in both positions.

Example of violation: A selectman buys a surplus truck from the town DPW.

Example of violation: A full-time secretary for the board of health wants to have a second paid job working part-time for the town library. She will violate Section 20 unless she can meet the requirements of an exemption.

Example of violation: A city councilor wants to work for a non-profit that receives funding under a contract with her city. Unless she can satisfy the requirements of an exemption under Section 20, she cannot take the job.

There are numerous exemptions. A municipal employee may hold multiple unpaid or elected positions. Some exemptions apply only to special municipal employees. Specific exemptions may cover serving as an unpaid volunteer in a second town position, housing-related benefits, public safety positions, certain elected positions, small towns, and other specific situations. Please call the Ethics Commission's Legal Division for advice about a specific situation.

IV. After you leave municipal employment. (See Section 18)

(a) Forever ban. After you leave your municipal job, you may never work for anyone other than the municipality on a matter that you worked on as a municipal employee.

If you participated in a matter as a municipal employee, you cannot ever be paid to work on that same matter for anyone other than the municipality, nor may you act for someone else, whether paid or not. The purpose of this restriction is to bar former employees from selling to private interests their familiarity with the facts of particular matters that are of continuing concern to their former municipal employer. The restriction does not prohibit former municipal employees from using the expertise acquired in government service in their subsequent private activities.

Example of violation: A former school department employee works for a contractor under a contract that she helped to draft and oversee for the school department.

(b) One year cooling-off period. For one year after you leave your municipal job you may not participate in any matter over which you had official responsibility during your last two years of public service.

Former municipal employees are barred for one year after they leave municipal employment from personally appearing before any agency of the municipality in connection with matters that were under their authority in their prior municipal positions during the two years before they left.

Example: An assistant town manager negotiates a three-year contract with a company. The town manager who supervised the assistant, and had official responsibility for the contract but did not participate in negotiating it, leaves her job to work for the company to which the contract was awarded. The former manager may not call or write the town in connection with the company's work on the contract for one year after leaving the town.

A former municipal employee who participated as such in general legislation on expanded gaming and related matters may not become an officer or employee of, or acquire a financial interest in, an applicant for a gaming license, or a gaming licensee, for one year after his public employment ceases.

(c) Partners. Your partners will be subject to restrictions while you serve as a municipal employee and after your municipal service ends.

Partners of municipal employees and former municipal employees are also subject to restrictions under the conflict of interest law. If a municipal employee participated in a matter, or if he has official responsibility for a matter, then his partner may not act on behalf of anyone other than the municipality or provide services as an attorney to anyone but the city or town in relation to the matter.

Example: While serving on a city's historic district commission, an architect reviewed an application to get landmark status for a building. His partners at his architecture firm may not prepare and sign plans for the owner of the building or otherwise act on the owner's behalf in relation to the application for landmark status. In addition, because the architect has official responsibility as a commissioner for every matter that comes before the commission, his partners may not communicate with the commission or otherwise act on behalf of any client on any matter that comes before the commission during the time that the architect serves on the commission.

Example: A former town counsel joins a law firm as a partner. Because she litigated a lawsuit for the town, her new partners cannot represent any private clients in the lawsuit for one year after her job with the town ended.

* * * * *

This summary is not intended to be legal advice and, because it is a summary, it does not mention every provision of the conflict law that may apply in a particular situation. Our website, <http://www.mass.gov/ethics> contains further information about how the law applies in many situations. You can also contact the Commission's Legal Division via our website, by telephone, or by letter. Our contact information is at the top of this document.

Version 5: Revised December 23, 2011

City of Chelsea
Conflict of Interest Law

Compliance Statement and Requirements for Vendors

ACKNOWLEDGMENT OF RECEIPT

I, _____,
(first and last name)

an employee at _____,
(name of vendor)

Hereby acknowledge that I received a copy of the summary of the conflict of interest law for municipal employees, revised December 23, 2011, on

_____.
(date)

The City has a requirement for compliance, which is to make sure that all **vendors** are provided copies of the Summary of the Conflict of Interest Law for Municipal Employees (including Vendors).

VENDORS should copy the Summary of the Conflict of Interest Law and provide it to each one of the employees who are assigned to work in Chelsea.

Each employee shall complete the "Acknowledgment of Receipt" and the Vendor shall return the acknowledgments-only (not the Summary) to the Chelsea the Chelsea Procurement Office.

The "Acknowledgment of Receipt" must be submitted along with any purchase order or contract with the City of Chelsea



**THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS**

Prevailing Wage Rates

**As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H**

RONALD L. WALKER, II
Secretary

WILLIAM D MCKINNEY
Director

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

Awarding Authority: City of Chelsea
Contract Number: 2017-11 **City/Town:** CHELSEA
Description of Work: ELC Roof Replacement @ 99 Shurtleff Street, Chelsea
Job Location: 99 Shurtleff Street, Chelsea, MA 02150

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the “Wage Request Number” on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards (“DLS”) if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F “rental of equipment” contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2016	\$33.25	\$10.41	\$10.08	\$0.00	\$53.74
	08/01/2016	\$33.25	\$10.91	\$10.08	\$0.00	\$54.24
	12/01/2016	\$33.25	\$10.91	\$10.89	\$0.00	\$55.05
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2016	\$33.32	\$10.41	\$10.08	\$0.00	\$53.81
	08/01/2016	\$33.32	\$10.91	\$10.08	\$0.00	\$54.31
	12/01/2016	\$33.32	\$10.91	\$10.89	\$0.00	\$55.12
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2016	\$33.44	\$10.41	\$10.08	\$0.00	\$53.93
	08/01/2016	\$33.44	\$10.91	\$10.08	\$0.00	\$54.43
	12/01/2016	\$33.44	\$10.91	\$10.89	\$0.00	\$55.24
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$88.29	\$9.80	\$19.23	\$0.00	\$117.32
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.85	\$7.45	\$13.55	\$0.00	\$57.85
	12/01/2016	\$37.85	\$7.45	\$13.55	\$0.00	\$58.85
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2015	\$34.38	\$10.40	\$5.95	\$0.00	\$50.73
ASPHALT RAKER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$44.23	\$10.00	\$15.15	\$0.00	\$69.38
	12/01/2016	\$45.48	\$10.00	\$15.15	\$0.00	\$70.63
	06/01/2017	\$46.48	\$10.00	\$15.15	\$0.00	\$71.63
	12/01/2017	\$47.48	\$10.00	\$15.15	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$44.23	\$10.00	\$15.15	\$0.00	\$69.38
	12/01/2016	\$45.48	\$10.00	\$15.15	\$0.00	\$70.63
	06/01/2017	\$46.48	\$10.00	\$15.15	\$0.00	\$71.63
	12/01/2017	\$47.48	\$10.00	\$15.15	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.85	\$7.45	\$13.55	\$0.00	\$57.85
	12/01/2016	\$37.85	\$7.45	\$13.55	\$0.00	\$58.85
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2016	\$41.62	\$6.97	\$16.21	\$0.00	\$64.80
	01/01/2017	\$42.92	\$6.97	\$16.21	\$0.00	\$66.10

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$27.05	\$6.97	\$10.54	\$0.00	\$44.56
2	65	\$27.05	\$6.97	\$10.54	\$0.00	\$44.56
3	70	\$29.13	\$6.97	\$11.35	\$0.00	\$47.45
4	75	\$31.22	\$6.97	\$12.16	\$0.00	\$50.35
5	80	\$33.30	\$6.97	\$12.97	\$0.00	\$53.24
6	85	\$35.38	\$6.97	\$13.78	\$0.00	\$56.13
7	90	\$37.46	\$6.97	\$14.59	\$0.00	\$59.02
8	95	\$39.54	\$6.97	\$15.40	\$0.00	\$61.91

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$27.90	\$6.97	\$10.54	\$0.00	\$45.41
2	65	\$27.90	\$6.97	\$10.54	\$0.00	\$45.41
3	70	\$30.04	\$6.97	\$11.35	\$0.00	\$48.36
4	75	\$32.19	\$6.97	\$12.16	\$0.00	\$51.32
5	80	\$34.34	\$6.97	\$12.97	\$0.00	\$54.28
6	85	\$36.48	\$6.97	\$13.78	\$0.00	\$57.23
7	90	\$38.63	\$6.97	\$14.59	\$0.00	\$60.19
8	95	\$40.77	\$6.97	\$15.40	\$0.00	\$63.14

Notes:

Apprentice to Journeyworker Ratio:1:5

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	02/01/2016	\$49.86	\$10.18	\$19.14	\$0.00	\$79.18
BRICKLAYERS LOCAL 3 (BOSTON)	08/01/2016	\$50.76	\$10.18	\$19.22	\$0.00	\$80.16
	02/01/2017	\$51.33	\$10.18	\$19.22	\$0.00	\$80.73

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Boston

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.93	\$10.18	\$19.14	\$0.00	\$54.25
2	60	\$29.92	\$10.18	\$19.14	\$0.00	\$59.24
3	70	\$34.90	\$10.18	\$19.14	\$0.00	\$64.22
4	80	\$39.89	\$10.18	\$19.14	\$0.00	\$69.21
5	90	\$44.87	\$10.18	\$19.14	\$0.00	\$74.19

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.38	\$10.18	\$19.22	\$0.00	\$54.78
2	60	\$30.46	\$10.18	\$19.22	\$0.00	\$59.86
3	70	\$35.53	\$10.18	\$19.22	\$0.00	\$64.93
4	80	\$40.61	\$10.18	\$19.22	\$0.00	\$70.01
5	90	\$45.68	\$10.18	\$19.22	\$0.00	\$75.08

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2016	\$37.20	\$7.45	\$13.75	\$0.00	\$58.40
	12/01/2016	\$38.20	\$7.45	\$13.75	\$0.00	\$59.40
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2016	\$36.05	\$7.45	\$13.75	\$0.00	\$57.25
	12/01/2016	\$37.05	\$7.45	\$13.75	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2016	\$36.05	\$7.45	\$13.75	\$0.00	\$57.25
	12/01/2016	\$37.05	\$7.45	\$13.75	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS -ZONE 1 (Metro Boston)</i>	03/01/2016	\$43.92	\$9.80	\$16.82	\$0.00	\$70.54
	09/01/2016	\$45.01	\$9.80	\$16.82	\$0.00	\$71.63
	03/01/2017	\$46.09	\$9.80	\$16.82	\$0.00	\$72.71
	09/01/2017	\$47.21	\$9.80	\$16.82	\$0.00	\$73.83
	03/01/2018	\$48.32	\$9.80	\$16.82	\$0.00	\$74.94
	09/01/2018	\$49.47	\$9.80	\$16.82	\$0.00	\$76.09
	03/01/2019	\$50.62	\$9.80	\$16.82	\$0.00	\$77.24

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$45.23	\$10.00	\$15.15	\$0.00	\$70.38
	12/01/2016	\$46.48	\$10.00	\$15.15	\$0.00	\$71.63
	06/01/2017	\$47.48	\$10.00	\$15.15	\$0.00	\$72.63
	12/01/2017	\$48.48	\$10.00	\$15.15	\$0.00	\$73.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$30.40	\$10.00	\$15.15	\$0.00	\$55.55
	12/01/2016	\$31.27	\$10.00	\$15.15	\$0.00	\$56.42
	06/01/2017	\$31.96	\$10.00	\$15.15	\$0.00	\$57.11
	12/01/2017	\$32.65	\$10.00	\$15.15	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 1</i>	01/01/2016	\$49.51	\$7.85	\$16.10	\$0.00	\$73.46
	07/01/2016	\$50.46	\$7.85	\$16.10	\$0.00	\$74.41
	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.76	\$7.85	\$0.00	\$0.00	\$32.61
2	55	\$27.23	\$7.85	\$3.66	\$0.00	\$38.74
3	60	\$29.71	\$7.85	\$3.99	\$0.00	\$41.55
4	65	\$32.18	\$7.85	\$4.32	\$0.00	\$44.35
5	70	\$34.66	\$7.85	\$14.11	\$0.00	\$56.62
6	75	\$37.13	\$7.85	\$14.44	\$0.00	\$59.42
7	80	\$39.61	\$7.85	\$14.77	\$0.00	\$62.23
8	90	\$44.56	\$7.85	\$15.44	\$0.00	\$67.85

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.23	\$7.85	\$0.00	\$0.00	\$33.08
2	55	\$27.75	\$7.85	\$3.66	\$0.00	\$39.26
3	60	\$30.28	\$7.85	\$3.99	\$0.00	\$42.12
4	65	\$32.80	\$7.85	\$4.32	\$0.00	\$44.97
5	70	\$35.32	\$7.85	\$14.11	\$0.00	\$57.28
6	75	\$37.85	\$7.85	\$14.44	\$0.00	\$60.14
7	80	\$40.37	\$7.85	\$14.77	\$0.00	\$62.99
8	90	\$45.41	\$7.85	\$15.44	\$0.00	\$68.70

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.50	\$7.45	\$13.55	\$0.00	\$56.50
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2015	\$36.50	\$7.45	\$13.55	\$0.00	\$57.50
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS <i>LABORERS - ZONE 1</i>	12/01/2015	\$36.25	\$7.45	\$13.55	\$0.00	\$57.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 1</i>	12/01/2015	\$36.50	\$7.45	\$13.55	\$0.00	\$57.50
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2015	\$36.25	\$7.45	\$13.55	\$0.00	\$57.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.50	\$7.45	\$13.55	\$0.00	\$56.50
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$58.86	\$9.80	\$19.23	\$0.00	\$87.89
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$63.06	\$9.80	\$19.23	\$0.00	\$92.09
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$88.23	\$9.80	\$19.23	\$0.00	\$117.26
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>ELECTRICIANS LOCAL 103</i>	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 103

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$18.47	\$13.00	\$0.55	\$0.00	\$32.02
2	40	\$18.47	\$13.00	\$0.55	\$0.00	\$32.02
3	45	\$20.78	\$13.00	\$12.34	\$0.00	\$46.12
4	45	\$20.78	\$13.00	\$12.34	\$0.00	\$46.12
5	50	\$23.09	\$13.00	\$12.71	\$0.00	\$48.80
6	55	\$25.39	\$13.00	\$13.07	\$0.00	\$51.46
7	60	\$27.70	\$13.00	\$13.44	\$0.00	\$54.14
8	65	\$30.01	\$13.00	\$13.81	\$0.00	\$56.82
9	70	\$32.32	\$13.00	\$14.18	\$0.00	\$59.50
10	75	\$34.63	\$13.00	\$14.55	\$0.00	\$62.18

Notes: :
App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR	01/01/2016	\$54.53	\$14.43	\$14.96	\$0.00	\$83.92
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2017	\$55.86	\$15.28	\$15.71	\$0.00	\$86.85

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.27	\$14.43	\$0.00	\$0.00	\$41.70
2	55	\$29.99	\$14.43	\$14.96	\$0.00	\$59.38
3	65	\$35.44	\$14.43	\$14.96	\$0.00	\$64.83
4	70	\$38.17	\$14.43	\$14.96	\$0.00	\$67.56
5	80	\$43.62	\$14.43	\$14.96	\$0.00	\$73.01

Effective Date - 01/01/2017

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.93	\$15.28	\$0.00	\$0.00	\$43.21
2	55	\$30.72	\$15.28	\$15.71	\$0.00	\$61.71
3	65	\$36.31	\$15.28	\$15.71	\$0.00	\$67.30
4	70	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09
5	80	\$44.69	\$15.28	\$15.71	\$0.00	\$75.68

Notes:
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER	01/01/2016	\$38.17	\$14.43	\$14.96	\$0.00	\$67.56
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2017	\$39.10	\$15.28	\$15.71	\$0.00	\$70.09

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FENCE & GUARD RAIL ERECTOR <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2016	\$41.03	\$10.00	\$14.90	\$0.00	\$65.93
	11/01/2016	\$41.62	\$10.00	\$14.90	\$0.00	\$66.52
	05/01/2017	\$42.50	\$10.00	\$14.90	\$0.00	\$67.40
	11/01/2017	\$43.23	\$10.00	\$14.90	\$0.00	\$68.13
	05/01/2018	\$43.94	\$10.00	\$14.90	\$0.00	\$68.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2016	\$42.47	\$10.00	\$14.90	\$0.00	\$67.37
	11/01/2016	\$43.07	\$10.00	\$14.90	\$0.00	\$67.97
	05/01/2017	\$43.96	\$10.00	\$14.90	\$0.00	\$68.86
	11/01/2017	\$44.69	\$10.00	\$14.90	\$0.00	\$69.59
	05/01/2018	\$45.41	\$10.00	\$14.90	\$0.00	\$70.31
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2016	\$21.88	\$10.00	\$14.90	\$0.00	\$46.78
	11/01/2016	\$22.23	\$10.00	\$14.90	\$0.00	\$47.13
	05/01/2017	\$22.76	\$10.00	\$14.90	\$0.00	\$47.66
	11/01/2017	\$23.18	\$10.00	\$14.90	\$0.00	\$48.08
	05/01/2018	\$23.61	\$10.00	\$14.90	\$0.00	\$48.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 103</i>	03/01/2016	\$34.63	\$13.00	\$14.55	\$0.00	\$62.18
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$36.71	\$10.00	\$15.15	\$0.00	\$61.86
	12/01/2016	\$37.75	\$10.00	\$15.15	\$0.00	\$62.90
	06/01/2017	\$38.59	\$10.00	\$15.15	\$0.00	\$63.74
	12/01/2017	\$39.42	\$10.00	\$15.15	\$0.00	\$64.57
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER <i>LABORERS - ZONE 1</i>	06/01/2016	\$20.50	\$7.45	\$13.55	\$0.00	\$41.50
	12/01/2016	\$20.50	\$7.45	\$13.55	\$0.00	\$41.50
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	03/01/2016	\$42.13	\$9.80	\$17.62	\$0.00	\$69.55

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - FLOORCOVERER - Local 2168 Zone 1

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.07	\$9.80	\$1.79	\$0.00	\$32.66
2	55	\$23.17	\$9.80	\$1.79	\$0.00	\$34.76
3	60	\$25.28	\$9.80	\$12.25	\$0.00	\$47.33
4	65	\$27.38	\$9.80	\$12.25	\$0.00	\$49.43
5	70	\$29.49	\$9.80	\$14.04	\$0.00	\$53.33
6	75	\$31.60	\$9.80	\$14.04	\$0.00	\$55.44
7	80	\$33.70	\$9.80	\$15.83	\$0.00	\$59.33
8	85	\$35.81	\$9.80	\$15.83	\$0.00	\$61.44

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER	06/01/2016	\$44.23	\$10.00	\$15.15	\$0.00	\$69.38
<i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2016	\$45.48	\$10.00	\$15.15	\$0.00	\$70.63
	06/01/2017	\$46.48	\$10.00	\$15.15	\$0.00	\$71.63
	12/01/2017	\$47.48	\$10.00	\$15.15	\$0.00	\$72.63

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GENERATOR/LIGHTING PLANT/HEATERS	06/01/2016	\$30.40	\$10.00	\$15.15	\$0.00	\$55.55
<i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2016	\$31.27	\$10.00	\$15.15	\$0.00	\$56.42
	06/01/2017	\$31.96	\$10.00	\$15.15	\$0.00	\$57.11
	12/01/2017	\$32.65	\$10.00	\$15.15	\$0.00	\$57.80

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	01/01/2016	\$44.80	\$7.85	\$16.10	\$0.00	\$68.75
<i>GLAZIERS LOCAL 35 (ZONE 1)</i>	07/01/2016	\$45.75	\$7.85	\$16.10	\$0.00	\$69.70
	01/01/2017	\$46.70	\$7.85	\$16.10	\$0.00	\$70.65

Apprentice - GLAZIER - Local 35 Zone 1

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.40	\$7.85	\$0.00	\$0.00	\$30.25
2	55	\$24.64	\$7.85	\$3.66	\$0.00	\$36.15
3	60	\$26.88	\$7.85	\$3.99	\$0.00	\$38.72
4	65	\$29.12	\$7.85	\$4.32	\$0.00	\$41.29
5	70	\$31.36	\$7.85	\$14.11	\$0.00	\$53.32
6	75	\$33.60	\$7.85	\$14.44	\$0.00	\$55.89
7	80	\$35.84	\$7.85	\$14.77	\$0.00	\$58.46
8	90	\$40.32	\$7.85	\$15.44	\$0.00	\$63.61

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.88	\$7.85	\$0.00	\$0.00	\$30.73
2	55	\$25.16	\$7.85	\$3.66	\$0.00	\$36.67
3	60	\$27.45	\$7.85	\$3.99	\$0.00	\$39.29
4	65	\$29.74	\$7.85	\$4.32	\$0.00	\$41.91
5	70	\$32.03	\$7.85	\$14.11	\$0.00	\$53.99
6	75	\$34.31	\$7.85	\$14.44	\$0.00	\$56.60
7	80	\$36.60	\$7.85	\$14.77	\$0.00	\$59.22
8	90	\$41.18	\$7.85	\$15.44	\$0.00	\$64.47

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS	06/01/2016	\$44.23	\$10.00	\$15.15	\$0.00	\$69.38
OPERATING ENGINEERS LOCAL 4	12/01/2016	\$45.48	\$10.00	\$15.15	\$0.00	\$70.63
	06/01/2017	\$46.48	\$10.00	\$15.15	\$0.00	\$71.63
	12/01/2017	\$47.48	\$10.00	\$15.15	\$0.00	\$72.63

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 06/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$24.33	\$10.00	\$0.00	\$0.00	\$34.33
2	60	\$26.54	\$10.00	\$15.15	\$0.00	\$51.69
3	65	\$28.75	\$10.00	\$15.15	\$0.00	\$53.90
4	70	\$30.96	\$10.00	\$15.15	\$0.00	\$56.11
5	75	\$33.17	\$10.00	\$15.15	\$0.00	\$58.32
6	80	\$35.38	\$10.00	\$15.15	\$0.00	\$60.53
7	85	\$37.60	\$10.00	\$15.15	\$0.00	\$62.75
8	90	\$39.81	\$10.00	\$15.15	\$0.00	\$64.96

Effective Date - 12/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$25.01	\$10.00	\$0.00	\$0.00	\$35.01
2	60	\$27.29	\$10.00	\$15.15	\$0.00	\$52.44
3	65	\$29.56	\$10.00	\$15.15	\$0.00	\$54.71
4	70	\$31.84	\$10.00	\$15.15	\$0.00	\$56.99
5	75	\$34.11	\$10.00	\$15.15	\$0.00	\$59.26
6	80	\$36.38	\$10.00	\$15.15	\$0.00	\$61.53
7	85	\$38.66	\$10.00	\$15.15	\$0.00	\$63.81
8	90	\$40.93	\$10.00	\$15.15	\$0.00	\$66.08

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2016	\$43.31	\$10.70	\$21.95	\$2.28	\$78.24
	08/01/2016	\$44.46	\$10.70	\$21.95	\$2.28	\$79.39
	02/01/2017	\$45.56	\$10.70	\$21.95	\$2.28	\$80.49
	08/01/2017	\$46.66	\$10.70	\$21.95	\$2.28	\$81.59
	02/01/2018	\$47.81	\$10.70	\$21.95	\$2.28	\$82.74

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 103</i>	03/01/2016	\$46.17	\$13.00	\$16.39	\$0.00	\$75.56
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For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2016	\$43.31	\$10.70	\$21.95	\$2.28	\$78.24
	08/01/2016	\$44.46	\$10.70	\$21.95	\$2.28	\$79.39
	02/01/2017	\$45.56	\$10.70	\$21.95	\$2.28	\$80.49
	08/01/2017	\$46.66	\$10.70	\$21.95	\$2.28	\$81.59
	02/01/2018	\$47.81	\$10.70	\$21.95	\$2.28	\$82.74

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537</i>	03/01/2016	\$49.19	\$9.70	\$18.14	\$0.00	\$77.03
	09/01/2016	\$50.19	\$9.70	\$18.14	\$0.00	\$78.03
	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	03/01/2016	\$49.19	\$9.70	\$18.14	\$0.00	\$77.03
	09/01/2016	\$50.19	\$9.70	\$18.14	\$0.00	\$78.03
	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

HYDRAULIC DRILLS <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.85	\$7.45	\$13.55	\$0.00	\$57.85
	12/01/2016	\$37.85	\$7.45	\$13.55	\$0.00	\$58.85

For apprentice rates see "Apprentice- LABORER"

INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2015	\$43.81	\$11.50	\$13.80	\$0.00	\$69.11
	09/01/2016	\$45.81	\$11.50	\$13.80	\$0.00	\$71.11
	09/01/2017	\$47.81	\$11.50	\$13.80	\$0.00	\$73.11
	09/01/2018	\$50.06	\$11.50	\$13.80	\$0.00	\$75.36
	09/01/2019	\$52.56	\$11.50	\$13.80	\$0.00	\$77.86

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston

Effective Date - 09/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.91	\$11.50	\$10.05	\$0.00	\$43.46
2	60	\$26.29	\$11.50	\$10.80	\$0.00	\$48.59
3	70	\$30.67	\$11.50	\$11.55	\$0.00	\$53.72
4	80	\$35.05	\$11.50	\$12.30	\$0.00	\$58.85

Effective Date - 09/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.91	\$11.50	\$10.05	\$0.00	\$44.46
2	60	\$27.49	\$11.50	\$10.80	\$0.00	\$49.79
3	70	\$32.07	\$11.50	\$11.55	\$0.00	\$55.12
4	80	\$36.65	\$11.50	\$12.30	\$0.00	\$60.45

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (BOSTON AREA)</i>	03/16/2016	\$43.40	\$7.80	\$20.85	\$0.00	\$72.05
	09/16/2016	\$44.05	\$7.80	\$20.85	\$0.00	\$72.70
	03/16/2017	\$44.65	\$7.80	\$20.85	\$0.00	\$73.30

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 03/16/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.04	\$7.80	\$20.85	\$0.00	\$54.69
2	70	\$30.38	\$7.80	\$20.85	\$0.00	\$59.03
3	75	\$32.55	\$7.80	\$20.85	\$0.00	\$61.20
4	80	\$34.72	\$7.80	\$20.85	\$0.00	\$63.37
5	85	\$36.89	\$7.80	\$20.85	\$0.00	\$65.54
6	90	\$39.06	\$7.80	\$20.85	\$0.00	\$67.71

Effective Date - 09/16/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.43	\$7.80	\$20.85	\$0.00	\$55.08
2	70	\$30.84	\$7.80	\$20.85	\$0.00	\$59.49
3	75	\$33.04	\$7.80	\$20.85	\$0.00	\$61.69
4	80	\$35.24	\$7.80	\$20.85	\$0.00	\$63.89
5	85	\$37.44	\$7.80	\$20.85	\$0.00	\$66.09
6	90	\$39.65	\$7.80	\$20.85	\$0.00	\$68.30

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
LABORERS - ZONE 1	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
LABORER	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
LABORERS - ZONE 1	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10

Apprentice - LABORER - Zone 1

Effective Date - 06/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.66	\$7.45	\$13.55	\$0.00	\$42.66
2	70	\$25.27	\$7.45	\$13.55	\$0.00	\$46.27
3	80	\$28.88	\$7.45	\$13.55	\$0.00	\$49.88
4	90	\$32.49	\$7.45	\$13.55	\$0.00	\$53.49

Effective Date - 12/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.26	\$7.45	\$13.55	\$0.00	\$43.26
2	70	\$25.97	\$7.45	\$13.55	\$0.00	\$46.97
3	80	\$29.68	\$7.45	\$13.55	\$0.00	\$50.68
4	90	\$33.39	\$7.45	\$13.55	\$0.00	\$54.39

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
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For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 1</i>	12/01/2015	\$35.50	\$7.45	\$13.55	\$0.00	\$56.50
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For apprentice rates see "Apprentice- LABORER"

LABORER: MASON TENDER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10

For apprentice rates see "Apprentice- LABORER"

LABORER: TREE REMOVER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10

This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"

LASER BEAM OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2016	\$38.08	\$10.18	\$17.70	\$0.00	\$65.96
	08/01/2016	\$38.78	\$10.18	\$17.78	\$0.00	\$66.74
	02/01/2017	\$39.24	\$10.18	\$17.78	\$0.00	\$67.20

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.04	\$10.18	\$17.70	\$0.00	\$46.92
2	60	\$22.85	\$10.18	\$17.70	\$0.00	\$50.73
3	70	\$26.66	\$10.18	\$17.70	\$0.00	\$54.54
4	80	\$30.46	\$10.18	\$17.70	\$0.00	\$58.34
5	90	\$34.27	\$10.18	\$17.70	\$0.00	\$62.15

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.39	\$10.18	\$17.78	\$0.00	\$47.35
2	60	\$23.27	\$10.18	\$17.78	\$0.00	\$51.23
3	70	\$27.15	\$10.18	\$17.78	\$0.00	\$55.11
4	80	\$31.02	\$10.18	\$17.78	\$0.00	\$58.98
5	90	\$34.90	\$10.18	\$17.78	\$0.00	\$62.86

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS, TILELAYERS & TERRAZZO MECH BRICKLAYERS LOCAL 3 - MARBLE & TILE	02/01/2016	\$49.90	\$10.18	\$19.14	\$0.00	\$79.22
	08/01/2016	\$50.80	\$10.18	\$19.22	\$0.00	\$80.20
	02/01/2017	\$51.37	\$10.18	\$19.22	\$0.00	\$80.77

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.95	\$10.18	\$19.14	\$0.00	\$54.27
2	60	\$29.94	\$10.18	\$19.14	\$0.00	\$59.26
3	70	\$34.93	\$10.18	\$19.14	\$0.00	\$64.25
4	80	\$39.92	\$10.18	\$19.14	\$0.00	\$69.24
5	90	\$44.91	\$10.18	\$19.14	\$0.00	\$74.23

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.40	\$10.18	\$19.22	\$0.00	\$54.80
2	60	\$30.48	\$10.18	\$19.22	\$0.00	\$59.88
3	70	\$35.56	\$10.18	\$19.22	\$0.00	\$64.96
4	80	\$40.64	\$10.18	\$19.22	\$0.00	\$70.04
5	90	\$45.72	\$10.18	\$19.22	\$0.00	\$75.12

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 1) <i>MILLWRIGHTS LOCAL 1121 - Zone 1</i>	04/01/2015	\$37.64	\$9.80	\$16.21	\$0.00	\$63.65
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MILLWRIGHT - Local 1121 Zone 1

Effective Date - 04/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$20.70	\$9.80	\$4.48	\$0.00	\$34.98
2	65	\$24.47	\$9.80	\$13.36	\$0.00	\$47.63
3	75	\$28.23	\$9.80	\$14.18	\$0.00	\$52.21
4	85	\$31.99	\$9.80	\$14.99	\$0.00	\$56.78

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$22.41	\$10.00	\$15.15	\$0.00	\$47.56
	12/01/2016	\$23.06	\$10.00	\$15.15	\$0.00	\$48.21
	06/01/2017	\$23.57	\$10.00	\$15.15	\$0.00	\$48.72
	12/01/2017	\$24.09	\$10.00	\$15.15	\$0.00	\$49.24
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$26.29	\$10.00	\$15.15	\$0.00	\$51.44
	12/01/2016	\$27.04	\$10.00	\$15.15	\$0.00	\$52.19
	06/01/2017	\$27.64	\$10.00	\$15.15	\$0.00	\$52.79
	12/01/2017	\$28.25	\$10.00	\$15.15	\$0.00	\$53.40
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 1</i>	01/01/2016	\$49.51	\$7.85	\$16.10	\$0.00	\$73.46
	07/01/2016	\$50.46	\$7.85	\$16.10	\$0.00	\$74.41
	01/01/2017	\$51.41	\$7.85	\$16.10	\$0.00	\$75.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.76	\$7.85	\$0.00	\$0.00	\$32.61
2	55	\$27.23	\$7.85	\$3.66	\$0.00	\$38.74
3	60	\$29.71	\$7.85	\$3.99	\$0.00	\$41.55
4	65	\$32.18	\$7.85	\$4.32	\$0.00	\$44.35
5	70	\$34.66	\$7.85	\$14.11	\$0.00	\$56.62
6	75	\$37.13	\$7.85	\$14.44	\$0.00	\$59.42
7	80	\$39.61	\$7.85	\$14.77	\$0.00	\$62.23
8	90	\$44.56	\$7.85	\$15.44	\$0.00	\$67.85

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.23	\$7.85	\$0.00	\$0.00	\$33.08
2	55	\$27.75	\$7.85	\$3.66	\$0.00	\$39.26
3	60	\$30.28	\$7.85	\$3.99	\$0.00	\$42.12
4	65	\$32.80	\$7.85	\$4.32	\$0.00	\$44.97
5	70	\$35.32	\$7.85	\$14.11	\$0.00	\$57.28
6	75	\$37.85	\$7.85	\$14.44	\$0.00	\$60.14
7	80	\$40.37	\$7.85	\$14.77	\$0.00	\$62.99
8	90	\$45.41	\$7.85	\$15.44	\$0.00	\$68.70

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2016	\$46.20	\$7.85	\$16.10	\$0.00	\$70.15
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 1	07/01/2016	\$47.15	\$7.85	\$16.10	\$0.00	\$71.10
	01/01/2017	\$48.10	\$7.85	\$16.10	\$0.00	\$72.05

Apprentice - PAINTER Local 35 Zone 1 - Spray/Sandblast - New

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.10	\$7.85	\$0.00	\$0.00	\$30.95
2	55	\$25.41	\$7.85	\$3.66	\$0.00	\$36.92
3	60	\$27.72	\$7.85	\$3.99	\$0.00	\$39.56
4	65	\$30.03	\$7.85	\$4.32	\$0.00	\$42.20
5	70	\$32.34	\$7.85	\$14.11	\$0.00	\$54.30
6	75	\$34.65	\$7.85	\$14.44	\$0.00	\$56.94
7	80	\$36.96	\$7.85	\$14.77	\$0.00	\$59.58
8	90	\$41.58	\$7.85	\$15.44	\$0.00	\$64.87

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.58	\$7.85	\$0.00	\$0.00	\$31.43
2	55	\$25.93	\$7.85	\$3.66	\$0.00	\$37.44
3	60	\$28.29	\$7.85	\$3.99	\$0.00	\$40.13
4	65	\$30.65	\$7.85	\$4.32	\$0.00	\$42.82
5	70	\$33.01	\$7.85	\$14.11	\$0.00	\$54.97
6	75	\$35.36	\$7.85	\$14.44	\$0.00	\$57.65
7	80	\$37.72	\$7.85	\$14.77	\$0.00	\$60.34
8	90	\$42.44	\$7.85	\$15.44	\$0.00	\$65.73

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2016	\$44.26	\$7.85	\$16.10	\$0.00	\$68.21
PAINTERS LOCAL 35 - ZONE 1	07/01/2016	\$45.21	\$7.85	\$16.10	\$0.00	\$69.16
	01/01/2017	\$46.16	\$7.85	\$16.10	\$0.00	\$70.11

Apprentice - PAINTER Local 35 Zone 1 - Spray/Sandblast - Repaint

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.13	\$7.85	\$0.00	\$0.00	\$29.98
2	55	\$24.34	\$7.85	\$3.66	\$0.00	\$35.85
3	60	\$26.56	\$7.85	\$3.99	\$0.00	\$38.40
4	65	\$28.77	\$7.85	\$4.32	\$0.00	\$40.94
5	70	\$30.98	\$7.85	\$14.11	\$0.00	\$52.94
6	75	\$33.20	\$7.85	\$14.44	\$0.00	\$55.49
7	80	\$35.41	\$7.85	\$14.77	\$0.00	\$58.03
8	90	\$39.83	\$7.85	\$15.44	\$0.00	\$63.12

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.61	\$7.85	\$0.00	\$0.00	\$30.46
2	55	\$24.87	\$7.85	\$3.66	\$0.00	\$36.38
3	60	\$27.13	\$7.85	\$3.99	\$0.00	\$38.97
4	65	\$29.39	\$7.85	\$4.32	\$0.00	\$41.56
5	70	\$31.65	\$7.85	\$14.11	\$0.00	\$53.61
6	75	\$33.91	\$7.85	\$14.44	\$0.00	\$56.20
7	80	\$36.17	\$7.85	\$14.77	\$0.00	\$58.79
8	90	\$40.69	\$7.85	\$15.44	\$0.00	\$63.98

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS)	06/01/2016	\$36.10	\$7.45	\$13.55	\$0.00	\$57.10
LABORERS - ZONE 1	12/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10
For Apprentice rates see "Apprentice- LABORER"						
PAINTER / TAPER (BRUSH, NEW) *	01/01/2016	\$44.80	\$7.85	\$16.10	\$0.00	\$68.75
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 1	07/01/2016	\$45.75	\$7.85	\$16.10	\$0.00	\$69.70
	01/01/2017	\$46.70	\$7.85	\$16.10	\$0.00	\$70.65

Apprentice - PAINTER - Local 35 Zone 1 - BRUSH NEW

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.40	\$7.85	\$0.00	\$0.00	\$30.25
2	55	\$24.64	\$7.85	\$3.66	\$0.00	\$36.15
3	60	\$26.88	\$7.85	\$3.99	\$0.00	\$38.72
4	65	\$29.12	\$7.85	\$4.32	\$0.00	\$41.29
5	70	\$31.36	\$7.85	\$14.11	\$0.00	\$53.32
6	75	\$33.60	\$7.85	\$14.44	\$0.00	\$55.89
7	80	\$35.84	\$7.85	\$14.77	\$0.00	\$58.46
8	90	\$40.32	\$7.85	\$15.44	\$0.00	\$63.61

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.88	\$7.85	\$0.00	\$0.00	\$30.73
2	55	\$25.16	\$7.85	\$3.66	\$0.00	\$36.67
3	60	\$27.45	\$7.85	\$3.99	\$0.00	\$39.29
4	65	\$29.74	\$7.85	\$4.32	\$0.00	\$41.91
5	70	\$32.03	\$7.85	\$14.11	\$0.00	\$53.99
6	75	\$34.31	\$7.85	\$14.44	\$0.00	\$56.60
7	80	\$36.60	\$7.85	\$14.77	\$0.00	\$59.22
8	90	\$41.18	\$7.85	\$15.44	\$0.00	\$64.47

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2016	\$42.86	\$7.85	\$16.10	\$0.00	\$66.81
PAINTERS LOCAL 35 - ZONE 1	07/01/2016	\$43.81	\$7.85	\$16.10	\$0.00	\$67.76
	01/01/2017	\$44.76	\$7.85	\$16.10	\$0.00	\$68.71

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 1 - BRUSH REPAINT

Effective Date - 01/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.43	\$7.85	\$0.00	\$0.00	\$29.28
2	55	\$23.57	\$7.85	\$3.66	\$0.00	\$35.08
3	60	\$25.72	\$7.85	\$3.99	\$0.00	\$37.56
4	65	\$27.86	\$7.85	\$4.32	\$0.00	\$40.03
5	70	\$30.00	\$7.85	\$14.11	\$0.00	\$51.96
6	75	\$32.15	\$7.85	\$14.44	\$0.00	\$54.44
7	80	\$34.29	\$7.85	\$14.77	\$0.00	\$56.91
8	90	\$38.57	\$7.85	\$15.44	\$0.00	\$61.86

Effective Date - 07/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.91	\$7.85	\$0.00	\$0.00	\$29.76
2	55	\$24.10	\$7.85	\$3.66	\$0.00	\$35.61
3	60	\$26.29	\$7.85	\$3.99	\$0.00	\$38.13
4	65	\$28.48	\$7.85	\$4.32	\$0.00	\$40.65
5	70	\$30.67	\$7.85	\$14.11	\$0.00	\$52.63
6	75	\$32.86	\$7.85	\$14.44	\$0.00	\$55.15
7	80	\$35.05	\$7.85	\$14.77	\$0.00	\$57.67
8	90	\$39.43	\$7.85	\$15.44	\$0.00	\$62.72

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2016	\$33.08	\$10.41	\$10.08	\$0.00	\$53.57
	08/01/2016	\$33.08	\$10.91	\$10.08	\$0.00	\$54.07
	12/01/2016	\$33.08	\$10.91	\$10.89	\$0.00	\$54.88
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2015	\$42.04	\$9.80	\$19.23	\$0.00	\$71.07

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PILE DRIVER - Local 56 Zone 1

Effective Date - 08/01/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.02	\$9.80	\$19.23	\$0.00	\$50.05
2	60	\$25.22	\$9.80	\$19.23	\$0.00	\$54.25
3	70	\$29.43	\$9.80	\$19.23	\$0.00	\$58.46
4	75	\$31.53	\$9.80	\$19.23	\$0.00	\$60.56
5	80	\$33.63	\$9.80	\$19.23	\$0.00	\$62.66
6	80	\$33.63	\$9.80	\$19.23	\$0.00	\$62.66
7	90	\$37.84	\$9.80	\$19.23	\$0.00	\$66.87
8	90	\$37.84	\$9.80	\$19.23	\$0.00	\$66.87

Notes:

Apprentice to Journeyworker Ratio:1:3

PIPEFITTER & STEAMFITTER PIPEFITTERS LOCAL 537	03/01/2016	\$49.19	\$9.70	\$18.14	\$0.00	\$77.03
	09/01/2016	\$50.19	\$9.70	\$18.14	\$0.00	\$78.03
	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03

Apprentice - PIPEFITTER - Local 537

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.68	\$9.70	\$7.50	\$0.00	\$36.88
2	45	\$22.14	\$9.70	\$18.14	\$0.00	\$49.98
3	60	\$29.51	\$9.70	\$18.14	\$0.00	\$57.35
4	70	\$34.43	\$9.70	\$18.14	\$0.00	\$62.27
5	80	\$39.35	\$9.70	\$18.14	\$0.00	\$67.19

Effective Date - 09/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.08	\$9.70	\$7.50	\$0.00	\$37.28
2	45	\$22.59	\$9.70	\$18.14	\$0.00	\$50.43
3	60	\$30.11	\$9.70	\$18.14	\$0.00	\$57.95
4	70	\$35.13	\$9.70	\$18.14	\$0.00	\$62.97
5	80	\$40.15	\$9.70	\$18.14	\$0.00	\$67.99

Notes:

** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.
Refrig/AC Mechanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

Apprentice to Journeyworker Ratio:**

PIPELAYER LABORERS - ZONE 1	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PLUMBERS & GASFITTERS <i>PLUMBERS & GASFITTERS LOCAL 12</i>	03/01/2016	\$51.36	\$11.07	\$15.14	\$0.00	\$77.57
	09/01/2016	\$52.41	\$11.07	\$15.14	\$0.00	\$78.62
	03/01/2017	\$53.41	\$11.07	\$15.14	\$0.00	\$79.62

Apprentice - PLUMBER/GASFITTER - Local 12

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$17.98	\$11.07	\$5.63	\$0.00	\$34.68
2	40	\$20.54	\$11.07	\$6.37	\$0.00	\$37.98
3	55	\$28.25	\$11.07	\$8.56	\$0.00	\$47.88
4	65	\$33.38	\$11.07	\$10.03	\$0.00	\$54.48
5	75	\$38.52	\$11.07	\$11.48	\$0.00	\$61.07

Effective Date - 09/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$18.34	\$11.07	\$5.63	\$0.00	\$35.04
2	40	\$20.96	\$11.07	\$6.36	\$0.00	\$38.39
3	55	\$28.83	\$11.07	\$8.55	\$0.00	\$48.45
4	65	\$34.07	\$11.07	\$10.02	\$0.00	\$55.16
5	75	\$39.31	\$11.07	\$11.48	\$0.00	\$61.86

Notes:

** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic\$57.78 Step5 with lic\$64.37

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	03/01/2016	\$49.19	\$9.70	\$18.14	\$0.00	\$77.03
	09/01/2016	\$50.19	\$9.70	\$18.14	\$0.00	\$78.03
	03/01/2017	\$51.19	\$9.70	\$18.14	\$0.00	\$79.03

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER <i>LABORERS - ZONE 1</i>	06/01/2016	\$37.10	\$7.45	\$13.55	\$0.00	\$58.10
	12/01/2016	\$38.10	\$7.45	\$13.55	\$0.00	\$59.10

For apprentice rates see "Apprentice- LABORER"

POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$44.23	\$10.00	\$15.15	\$0.00	\$69.38
	12/01/2016	\$45.48	\$10.00	\$15.15	\$0.00	\$70.63
	06/01/2017	\$46.48	\$10.00	\$15.15	\$0.00	\$71.63
	12/01/2017	\$47.48	\$10.00	\$15.15	\$0.00	\$72.63

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$44.23	\$10.00	\$15.15	\$0.00	\$69.38
	12/01/2016	\$45.48	\$10.00	\$15.15	\$0.00	\$70.63
	06/01/2017	\$46.48	\$10.00	\$15.15	\$0.00	\$71.63
	12/01/2017	\$47.48	\$10.00	\$15.15	\$0.00	\$72.63

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$30.40	\$10.00	\$15.15	\$0.00	\$55.55
	12/01/2016	\$31.27	\$10.00	\$15.15	\$0.00	\$56.42
	06/01/2017	\$31.96	\$10.00	\$15.15	\$0.00	\$57.11
	12/01/2017	\$32.65	\$10.00	\$15.15	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY MIX CONCRETE DRIVERS after 4/30/10 (Drivers Hired After 4/30/2010) <i>TEAMSTERS LOCAL 25c</i>	05/01/2016	\$28.03	\$7.98	\$9.31	\$0.00	\$45.32
	07/01/2016	\$28.03	\$8.23	\$9.31	\$0.00	\$45.57
	05/01/2017	\$28.18	\$8.23	\$9.72	\$0.00	\$46.13
	07/01/2017	\$28.18	\$8.48	\$9.72	\$0.00	\$46.38
READY-MIX CONCRETE DRIVER <i>TEAMSTERS LOCAL 25c</i>	05/01/2016	\$29.33	\$7.98	\$9.31	\$0.00	\$46.62
	07/01/2016	\$29.33	\$8.23	\$9.31	\$0.00	\$46.87
	05/01/2017	\$29.48	\$8.23	\$9.72	\$0.00	\$47.43
	07/01/2017	\$29.48	\$8.48	\$9.72	\$0.00	\$47.68
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RESIDENTIAL WOOD FRAME (All Other Work) <i>CARPENTERS -ZONE 2 (Residential Wood)</i>	04/01/2011	\$24.24	\$8.67	\$15.51	\$0.00	\$48.42
RESIDENTIAL WOOD FRAME CARPENTER ** ** The Residential Wood Frame Carpenter classification applies only to the construction of new, wood frame residences that do not exceed four stories including the basement. <i>CARPENTERS -ZONE 2 (Residential Wood)</i>	05/01/2011	\$24.24	\$6.34	\$6.23	\$0.00	\$36.81

As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate.

Apprentice - CARPENTER (Residential Wood Frame) - Zone 2

Effective Date - 05/01/2011

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$14.54	\$6.34	\$0.00	\$0.00	\$20.88
2	60	\$14.54	\$6.34	\$6.23	\$0.00	\$27.11
3	65	\$15.76	\$6.34	\$6.23	\$0.00	\$28.33
4	70	\$16.97	\$6.34	\$6.23	\$0.00	\$29.54
5	75	\$18.18	\$6.34	\$6.23	\$0.00	\$30.75
6	80	\$19.39	\$6.34	\$6.23	\$0.00	\$31.96
7	85	\$20.60	\$6.34	\$6.23	\$0.00	\$33.17
8	90	\$21.82	\$6.34	\$6.23	\$0.00	\$34.39

Notes:

Apprentice to Journeyworker Ratio:1:5

RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofing Waterproofing &Roofing Damproofg) <i>ROOFERS LOCAL 33</i>	02/01/2016	\$40.11	\$11.00	\$12.90	\$0.00	\$64.01

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.06	\$11.00	\$3.39	\$0.00	\$34.45
2	60	\$24.07	\$11.00	\$12.90	\$0.00	\$47.97
3	65	\$26.07	\$11.00	\$12.90	\$0.00	\$49.97
4	75	\$30.08	\$11.00	\$12.90	\$0.00	\$53.98
5	85	\$34.09	\$11.00	\$12.90	\$0.00	\$57.99

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 33</i>	02/01/2016	\$40.36	\$11.00	\$12.90	\$0.00	\$64.26
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2016	\$43.31	\$10.70	\$21.95	\$2.28	\$78.24
	08/01/2016	\$44.46	\$10.70	\$21.95	\$2.28	\$79.39
	02/01/2017	\$45.56	\$10.70	\$21.95	\$2.28	\$80.49
	08/01/2017	\$46.66	\$10.70	\$21.95	\$2.28	\$81.59
	02/01/2018	\$47.81	\$10.70	\$21.95	\$2.28	\$82.74

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.32	\$10.70	\$4.90	\$0.00	\$32.92
2	40	\$17.32	\$10.70	\$4.90	\$0.00	\$32.92
3	45	\$19.49	\$10.70	\$9.79	\$1.20	\$41.18
4	45	\$19.49	\$10.70	\$9.79	\$1.20	\$41.18
5	50	\$21.66	\$10.70	\$10.65	\$1.29	\$44.30
6	50	\$21.66	\$10.70	\$10.90	\$1.30	\$44.56
7	60	\$25.99	\$10.70	\$12.37	\$1.47	\$50.53
8	65	\$28.15	\$10.70	\$13.24	\$1.56	\$53.65
9	75	\$32.48	\$10.70	\$14.97	\$1.74	\$59.89
10	85	\$36.81	\$10.70	\$16.18	\$1.91	\$65.60

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.78	\$10.70	\$4.90	\$0.00	\$33.38
2	40	\$17.78	\$10.70	\$4.90	\$0.00	\$33.38
3	45	\$20.01	\$10.70	\$9.79	\$1.22	\$41.72
4	45	\$20.01	\$10.70	\$9.79	\$1.22	\$41.72
5	50	\$22.23	\$10.70	\$10.65	\$1.31	\$44.89
6	50	\$22.23	\$10.70	\$10.90	\$1.31	\$45.14
7	60	\$26.68	\$10.70	\$12.37	\$1.49	\$51.24
8	65	\$28.90	\$10.70	\$13.24	\$1.59	\$54.43
9	75	\$33.35	\$10.70	\$14.97	\$1.77	\$60.79
10	85	\$37.79	\$10.70	\$16.18	\$1.94	\$66.61

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SIGN ERECTOR PAINTERS LOCAL 35 - ZONE 1	06/01/2013	\$25.81	\$7.07	\$7.05	\$0.00	\$39.93
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SIGN ERECTOR - Local 35 Zone 1

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$12.91	\$7.07	\$0.00	\$0.00	\$19.98
2	55	\$14.20	\$7.07	\$2.45	\$0.00	\$23.72
3	60	\$15.49	\$7.07	\$2.45	\$0.00	\$25.01
4	65	\$16.78	\$7.07	\$2.45	\$0.00	\$26.30
5	70	\$18.07	\$7.07	\$7.05	\$0.00	\$32.19
6	75	\$19.36	\$7.07	\$7.05	\$0.00	\$33.48
7	80	\$20.65	\$7.07	\$7.05	\$0.00	\$34.77
8	85	\$21.94	\$7.07	\$7.05	\$0.00	\$36.06
9	90	\$23.23	\$7.07	\$7.05	\$0.00	\$37.35

Notes:
Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2016	\$33.54	\$10.41	\$10.08	\$0.00	\$54.03
	08/01/2016	\$33.54	\$10.91	\$10.08	\$0.00	\$54.53
	12/01/2016	\$33.54	\$10.91	\$10.89	\$0.00	\$55.34
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2016	\$33.83	\$10.41	\$10.08	\$0.00	\$54.32
	08/01/2016	\$33.83	\$10.91	\$10.08	\$0.00	\$54.82
	12/01/2016	\$33.83	\$10.91	\$10.89	\$0.00	\$55.63
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	03/01/2016	\$54.43	\$8.67	\$16.80	\$0.00	\$79.90
	10/01/2016	\$55.53	\$8.67	\$16.80	\$0.00	\$81.00
	03/01/2017	\$56.53	\$8.67	\$16.80	\$0.00	\$82.00

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.05	\$8.67	\$8.55	\$0.00	\$36.27
2	40	\$21.77	\$8.67	\$8.55	\$0.00	\$38.99
3	45	\$24.49	\$8.67	\$8.55	\$0.00	\$41.71
4	50	\$27.22	\$8.67	\$8.55	\$0.00	\$44.44
5	55	\$29.94	\$8.67	\$8.55	\$0.00	\$47.16
6	60	\$32.66	\$8.67	\$8.55	\$0.00	\$49.88
7	65	\$35.38	\$8.67	\$8.55	\$0.00	\$52.60
8	70	\$38.10	\$8.67	\$8.55	\$0.00	\$55.32
9	75	\$40.82	\$8.67	\$8.55	\$0.00	\$58.04
10	80	\$43.54	\$8.67	\$8.55	\$0.00	\$60.76

Effective Date - 10/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.44	\$8.67	\$8.55	\$0.00	\$36.66
2	40	\$22.21	\$8.67	\$8.55	\$0.00	\$39.43
3	45	\$24.99	\$8.67	\$8.55	\$0.00	\$42.21
4	50	\$27.77	\$8.67	\$8.55	\$0.00	\$44.99
5	55	\$30.54	\$8.67	\$8.55	\$0.00	\$47.76
6	60	\$33.32	\$8.67	\$8.55	\$0.00	\$50.54
7	65	\$36.09	\$8.67	\$8.55	\$0.00	\$53.31
8	70	\$38.87	\$8.67	\$8.55	\$0.00	\$56.09
9	75	\$41.65	\$8.67	\$8.55	\$0.00	\$58.87
10	80	\$44.42	\$8.67	\$8.55	\$0.00	\$61.64

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2016	\$34.63	\$13.00	\$14.55	\$0.00	\$62.18
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Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date - 03/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$13.85	\$13.00	\$0.42	\$0.00	\$27.27
2	40	\$13.85	\$13.00	\$0.42	\$0.00	\$27.27
3	45	\$15.58	\$13.00	\$11.52	\$0.00	\$40.10
4	45	\$15.58	\$13.00	\$11.52	\$0.00	\$40.10
5	50	\$17.32	\$13.00	\$11.79	\$0.00	\$42.11
6	55	\$19.05	\$13.00	\$12.06	\$0.00	\$44.11
7	60	\$20.78	\$13.00	\$12.34	\$0.00	\$46.12
8	65	\$22.51	\$13.00	\$12.62	\$0.00	\$48.13
9	70	\$24.24	\$13.00	\$12.90	\$0.00	\$50.14
10	75	\$25.97	\$13.00	\$13.17	\$0.00	\$52.14

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS	02/01/2016	\$48.80	\$10.18	\$19.14	\$0.00	\$78.12
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2016	\$49.70	\$10.18	\$19.22	\$0.00	\$79.10
	02/01/2017	\$50.27	\$10.18	\$19.22	\$0.00	\$79.67

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.40	\$10.18	\$19.14	\$0.00	\$53.72
2	60	\$29.28	\$10.18	\$19.14	\$0.00	\$58.60
3	70	\$34.16	\$10.18	\$19.14	\$0.00	\$63.48
4	80	\$39.04	\$10.18	\$19.14	\$0.00	\$68.36
5	90	\$43.92	\$10.18	\$19.14	\$0.00	\$73.24

Effective Date - 08/01/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.85	\$10.18	\$19.22	\$0.00	\$54.25
2	60	\$29.82	\$10.18	\$19.22	\$0.00	\$59.22
3	70	\$34.79	\$10.18	\$19.22	\$0.00	\$64.19
4	80	\$39.76	\$10.18	\$19.22	\$0.00	\$69.16
5	90	\$44.73	\$10.18	\$19.22	\$0.00	\$74.13

Notes:

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2016	\$37.45	\$7.45	\$13.75	\$0.00	\$58.65
	12/01/2016	\$38.45	\$7.45	\$13.75	\$0.00	\$59.65
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2016	\$36.17	\$7.45	\$13.75	\$0.00	\$57.37
	12/01/2016	\$37.17	\$7.45	\$13.75	\$0.00	\$58.37
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2016	\$36.05	\$7.45	\$13.75	\$0.00	\$57.25
	12/01/2016	\$37.05	\$7.45	\$13.75	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$43.81	\$10.00	\$15.15	\$0.00	\$68.96
	12/01/2016	\$45.04	\$10.00	\$15.15	\$0.00	\$70.19
	06/01/2017	\$46.03	\$10.00	\$15.15	\$0.00	\$71.18
	12/01/2017	\$47.02	\$10.00	\$15.15	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2016	\$34.12	\$10.41	\$10.08	\$0.00	\$54.61
	08/01/2016	\$34.12	\$10.91	\$10.08	\$0.00	\$55.11
	12/01/2016	\$34.12	\$10.91	\$10.89	\$0.00	\$55.92
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	06/01/2016	\$48.33	\$7.45	\$14.15	\$0.00	\$69.93
	12/01/2016	\$49.33	\$7.45	\$14.15	\$0.00	\$70.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	06/01/2016	\$50.33	\$7.45	\$14.15	\$0.00	\$71.93
	12/01/2016	\$51.33	\$7.45	\$14.15	\$0.00	\$72.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2016	\$40.40	\$7.45	\$14.15	\$0.00	\$62.00
	12/01/2016	\$41.40	\$7.45	\$14.15	\$0.00	\$63.00
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2016	\$42.40	\$7.45	\$14.15	\$0.00	\$64.00
	12/01/2016	\$43.40	\$7.45	\$14.15	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	06/01/2016	\$33.54	\$10.41	\$10.08	\$0.00	\$54.03
	08/01/2016	\$33.54	\$10.91	\$10.08	\$0.00	\$54.53
	12/01/2016	\$33.54	\$10.91	\$10.89	\$0.00	\$55.34
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2016	\$36.35	\$7.45	\$13.55	\$0.00	\$57.35
	12/01/2016	\$37.35	\$7.45	\$13.55	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2016	\$44.23	\$10.00	\$15.15	\$0.00	\$69.38
	12/01/2016	\$45.48	\$10.00	\$15.15	\$0.00	\$70.63
	06/01/2017	\$46.48	\$10.00	\$15.15	\$0.00	\$71.63
	12/01/2017	\$47.48	\$10.00	\$15.15	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12</i>	03/01/2016	\$51.36	\$11.07	\$15.14	\$0.00	\$77.57
	09/01/2016	\$52.41	\$11.07	\$15.14	\$0.00	\$78.62
	03/01/2017	\$53.41	\$11.07	\$15.14	\$0.00	\$79.62
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$26.11	\$7.25	\$1.78	\$0.00	\$35.14
	08/28/2016	\$26.61	\$7.50	\$1.80	\$0.00	\$35.91
	09/03/2017	\$27.14	\$7.75	\$1.81	\$0.00	\$36.70

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$36.98	\$7.25	\$8.12	\$0.00	\$52.35
	08/28/2016	\$37.70	\$7.50	\$8.87	\$0.00	\$54.07
	09/03/2017	\$38.45	\$7.75	\$9.53	\$0.00	\$55.73
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$30.46	\$7.25	\$8.34	\$0.00	\$46.05
	08/28/2016	\$31.05	\$7.50	\$8.89	\$0.00	\$47.44
	09/03/2017	\$31.66	\$7.75	\$9.44	\$0.00	\$48.85
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$23.93	\$7.25	\$1.72	\$0.00	\$32.90
	08/28/2016	\$24.39	\$7.50	\$1.73	\$0.00	\$33.62
	09/03/2017	\$24.88	\$7.75	\$1.75	\$0.00	\$34.38
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$36.98	\$7.25	\$12.29	\$0.00	\$56.52
	08/28/2016	\$37.70	\$7.50	\$12.95	\$0.00	\$58.15
	09/03/2017	\$38.45	\$7.75	\$13.61	\$0.00	\$59.81
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$32.63	\$7.25	\$9.05	\$0.00	\$48.93
	08/28/2016	\$33.26	\$7.50	\$9.63	\$0.00	\$50.39
	09/03/2017	\$33.92	\$7.75	\$10.21	\$0.00	\$51.88
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$23.93	\$7.25	\$1.72	\$0.00	\$32.90
	08/28/2016	\$24.39	\$7.50	\$1.73	\$0.00	\$33.62
	09/03/2017	\$24.88	\$7.75	\$1.75	\$0.00	\$34.38
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$19.58	\$7.25	\$1.59	\$0.00	\$28.42
	08/28/2016	\$19.96	\$7.50	\$1.60	\$0.00	\$29.06
	09/03/2017	\$20.35	\$7.75	\$1.61	\$0.00	\$29.71
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	08/30/2015	\$43.51	\$7.25	\$15.06	\$0.00	\$65.82
	08/28/2016	\$44.35	\$7.50	\$15.83	\$0.00	\$67.68
	09/03/2017	\$45.23	\$7.75	\$16.61	\$0.00	\$69.59

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 08/30/2015

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.11	\$7.25	\$3.28	\$0.00	\$36.64
2	65	\$28.28	\$7.25	\$3.35	\$0.00	\$38.88
3	70	\$30.46	\$7.25	\$3.41	\$0.00	\$41.12
4	75	\$32.63	\$7.25	\$4.98	\$0.00	\$44.86
5	80	\$34.81	\$7.25	\$5.04	\$0.00	\$47.10
6	85	\$36.98	\$7.25	\$5.11	\$0.00	\$49.34
7	90	\$39.16	\$7.25	\$7.17	\$0.00	\$53.58

Effective Date - 08/28/2016

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$26.61	\$7.50	\$3.30	\$0.00	\$37.41
2	65	\$28.83	\$7.50	\$3.36	\$0.00	\$39.69
3	70	\$31.05	\$7.50	\$3.43	\$0.00	\$41.98
4	75	\$33.26	\$7.50	\$5.00	\$0.00	\$45.76
5	80	\$35.48	\$7.50	\$5.06	\$0.00	\$48.04
6	85	\$37.70	\$7.50	\$5.13	\$0.00	\$50.33
7	90	\$39.92	\$7.50	\$7.20	\$0.00	\$54.62

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/01/2016 \$28.98 \$4.25 \$3.12 \$0.00 \$36.35

TELEDATA LINEMAN/EQUIPMENT OPERATOR
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/01/2016 \$27.31 \$4.25 \$3.07 \$0.00 \$34.63

TELEDATA WIREMAN/INSTALLER/TECHNICIAN
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/01/2016 \$27.31 \$4.25 \$3.07 \$0.00 \$34.63

TREE TRIMMER
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/31/2016 \$18.51 \$3.55 \$0.00 \$0.00 \$22.06

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.

TREE TRIMMER GROUNDMAN
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/31/2016 \$16.32 \$3.55 \$0.00 \$0.00 \$19.87

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.

Additional Apprentices Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentices ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.

*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

City of Chelsea Chelsea Public Schools

99 HAWTHORNE STREET

Chelsea, MA 02150

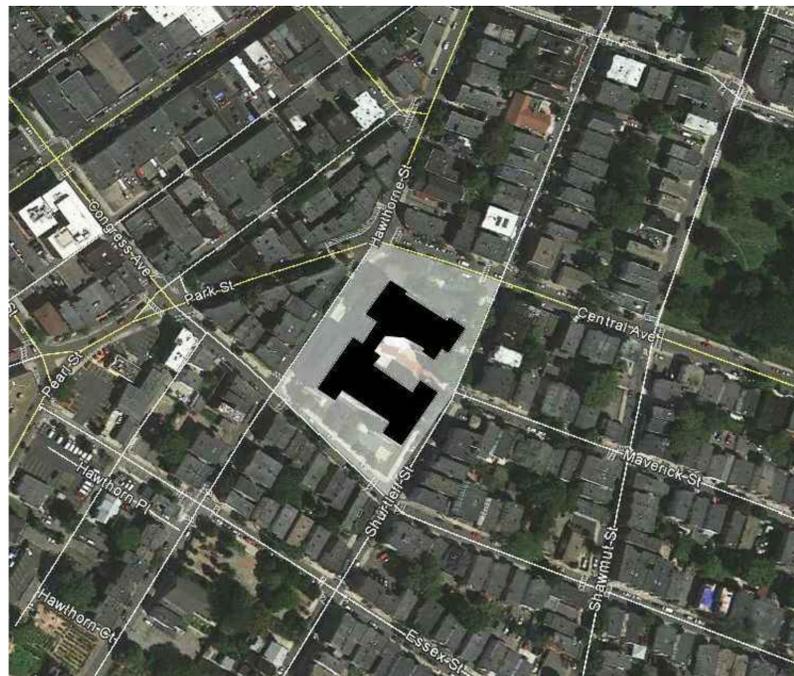


JOHN SILBER EARLY LEARNING CENTER (ELC) A.K.A. SHURTLEFF SCHOOL ROOFING PROJECT (SELECTIVE REPLACEMENT, REPAIR, AND RENOVATION) DRAWINGS:

DATE: JUNE 11, 2016



Locus Map:



Project Team:

JACOBS[™]
CONSULTANTS, INC.

343 Congress Street
Suite 2100
Boston, MA 02210

V: 617.242.9222
F: 617.242.9824

A part of the Jacobs Engineering Group, Inc.

Drawing List:

SHEET NO.	CONTENTS OF DRAWINGS
A0	COVER SHEET
A1	ROOF PLAN
A2.6	ORIGINAL ROOF PLAN (DATED 11.20.95)
A8.13	ORIGINAL ROOF DETAILS (DATED 11.20.95)

Code Summary:

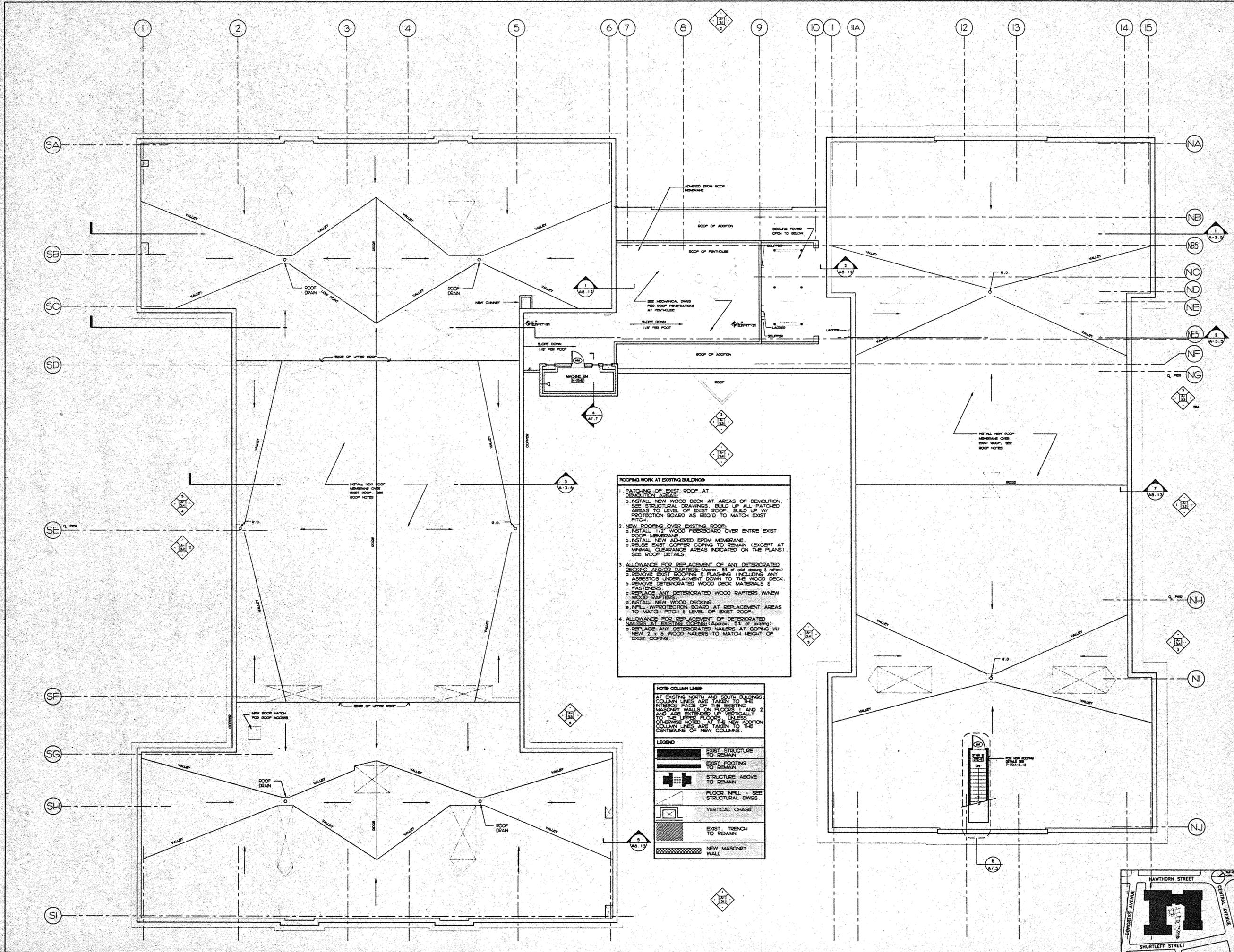
- PROJECT DESCRIPTION: REPLACE, REPAIR, RENOVATE, RESTORE ROOF AT EXISTING SCHOOL STRUCTURES
 - APPLICABLE CODES:
 - 2009 INTERNATIONAL CODES (I-CODES)
 - MASSACHUSETTS REGULATIONS
 - AREA OF WORK PROPOSED: 33,220 SF
 - SCOPE OF WORK SHALL BE BASED ON:
 - IEBC PRESCRIPTIVE COMPLIANCE METHOD
- IBC - INTERNATIONAL BUILDING CODE
IEBC - INTERNATIONAL EXISTING BUILDING CODE
IMC - INTERNATIONAL MECHANICAL CODE
IECC - INTERNATIONAL ENERGY CONSERVATION CODE
- 780 CMR - MA AMENDMENTS TO THE IBC
527 CMR - MA FIRE PREVENTION & ELEC.REGULATIONS
248 CMR - MA PLUMBING REGULATIONS

100% C.D.
SUBMISSION
10.16.05

Handwritten signature

REVISIONS

SCALE
1/8"=1'-0"
DATE
12.05
DRAWN BY
YLC/PL/SDP
CHECKED BY
PROJECT NUMBER
1995.00
DRAWING NUMBER



PROJECT: CHELSEA-5, NOV. NOV 27 TO 28, 03 1995

