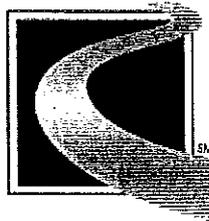


MARYLAND TRANSPORTATION AUTHORITY
Baltimore, Maryland

Invitation for Bids

POINT BREEZE



Maryland
Transportation
Authority

CONTRACT NO. PB 2241-000-007

**ROOF REPLACEMENT AT
THE GARAGE BUILDING**

BALTIMORE CITY

June 2010



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Appendix 1: *Hazardous Materials Survey Report Point Breeze Stable*
This report is included to complement Section 100.1 Asbestos Abatement

Appendix 2: *EFI Global/ Letter and Report: Screening for Lead-Based Paint*

Appendix 3: *Table 1/ Summary of all LBP Testing Results*

NOTICE TO BIDDERS

Please review the checklist prior to submitting your bid on this Contract.

- When submitting your completed bid, do not separate the book. Submit the whole book including all addenda acknowledgment pages.
- Make sure that all addenda letters are attached outside of the front cover of the bid book.
- If the addendum has revised the Schedule of Prices, make sure that you have included the revised pages in your bid. Your price should reflect any and all changes.
- Prices must be written numerically and in words, unless approved substitute forms are used (Refer to GP-2.06). Don't leave any items blank.
- When tabulating your final price, make sure all your calculations are correct.
- The Bid/Proposal Affidavit must be completely filled out and signed by all the parties as indicated.
- If Escrow is being offered in a contract, the contractor must indicate whether or not they wish to utilize an Escrow Account for Retained Funds on the provided form.
- A bid bond must accompany all bids of One Hundred Thousand Dollars (\$100,000.00) or more. The bid bond document must be completely filled out and have an original Power of Attorney form attached.
- If the document is too large for the envelope that we have provided, you can place the document in another form of packaging that can be sealed and submitted. If the document is too large for the bid box, you should alert the receptionist.
- Make sure that your company's name, address, the contract number and the bid date appears on the front of the packaging.
- When submitting bid packages via US Mail, Federal Express, DHL, UPS or any other delivery service it is your responsibility to make sure that the bid reaches the bid box before the time deadline. It may be in your best interest to send the package 24 hours in advance of the deadline. Also, when sending packages this way, make sure that the labeling specifies that it is a bid submission.

Notice to Bidders/Offerors

eMaryland Marketplace

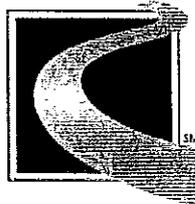
In order to take advantage of Maryland State and Local government contracting opportunities, vendors/contractors are encouraged to register with eMaryland Marketplace. The free registration provides a means for businesses to receive e-mail notification of upcoming contracting opportunities in their specified areas of interest and expertise.

For registration requirements, visit:
www.eMarylandMarketplace.com

MARYLAND TRANSPORTATION AUTHORITY
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Maryland
Transportation
Authority

Contract No. PB 2241-000-007

**ROOF REPLACEMENT AT
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NOTICE TO BIDDERS

A "Pre-Bid Session" for the purpose of answering or obtaining answers to questions of parties interested in constructing the work relative to Right-of-Way, Utilities, Design, and Construction Details will be conducted at 10:00 am, on July 16, 2010, in Conference Room 160 at 2310 Broening Highway Dundalk, Maryland 21222.



SP 1-1 PROJECT DESCRIPTION

CONTRACT NO.: **PB 2241-000-007**

TITLE: Roof Replacement at the Garage Building

FACILITY: Point Breeze

LOCATION: Baltimore City

ADVERTISED: **June 29, 2010**

PRE-BID MEETING: **10:00 a.m. on July 16, 2010** in Conference Room 160 at 2310 Broening Highway, Baltimore, MD 21222

PROJECT CONTACT: Project Manager: Mr. John Jewell (410) 537-7816
Contract Administration: Ms. Maggie Johnson (410) 537-7807

BIDS DUE: **12:00 Noon on August 4, 2010** in the Bid Box on the 1st floor of the Maryland Transportation Authority, Engineering Building, 300 Authority Drive, Baltimore, MD 21222

CLASSIFICATION: Class – B (\$100,001 – \$500,000)

CONTRACT TIME: One Hundred Twenty (120) Calendar Days

LIQUIDATED DAMAGES: **\$500.00 (Five Hundred Dollars) per Calendar Day**

MINIMUM MBE GOALS: 0 %

BID DOCUMENTS: **\$25.00** - Bid documents can be purchased between 7:30am and 3:30pm, Mondays, Wednesdays, Thursdays and Fridays and between 10:00am and 4:00pm on Tuesdays at the Ticket Office located at the Francis Scott Key Bridge, Maryland Transportation Authority, Administration Building, 303 Authority Drive, Baltimore, MD 21222.



Location and Scope of Work

This project is located at the Point Breeze Garage at 2330 Broening Highway, Baltimore, Md. 21222.

The scope of work will include, but is not limited to:

- Demolition and removal of existing roofing, flashing and other appurtenances
- Demolition and removal of existing concrete roof deck down to the top flange of the purlins.
- Installation of new composite roof deck panels, SBS modified membrane roofing with all necessary flashing and new roof drains.

SP 1-2 SPECIFICATIONS

All work on this project shall conform to the Maryland Department of Transportation, State Highway Administration's Specifications entitled, "Standard Specifications for Construction and Materials" dated July 2008, revisions thereof, or additions thereto, and the Special Provisions included in this Invitation for Bids.

SP 1-3 ORIGINAL FACILITY PLANS AND SITE VISITS

The original facility plans are on file at the Engineering/Finance Building of the Francis Scott Key Bridge and will be made available for inspection to prospective bidders. Parties interested in viewing the plans should contact Mr. John Jewell, at (410) 537-7816. Parties interested in visiting the site should contact Mr. David Shirk, at (410) 537-7677.

SP 1-4 - PROMPT PAYMENT TO SUBCONTRACTORS

The prime Contractor is responsible for making timely payments to all Subcontractors and Suppliers as required in the 2008 edition of the State Finance and Procurement Article of the Annotated Code of Maryland, Section 17-106.

This contract requires the Contractor to make payment to all Subcontractors within 10 days of receiving payment from the Authority.

Each month, the construction Project Engineer will review the current pay items with the prime Contractor and all involved Subcontractors to ensure that all work satisfactorily completed within specifications is included in the monthly progress payment. For payment purposes, the same quantity totals used to compute the payment to the prime Contractor will be the basis for payment to the Subcontractor.



If the Subcontractor does not receive payment within the required 10 days, the Subcontractor shall notify the Project Engineer in writing of the amount in dispute including the item numbers and payment quantity for each. The Project Engineer will then notify the Chief of Construction of the dispute. The Chief of Construction or his representative will verbally contact the prime Contractor within 48 hours to ascertain whether or not a performance dispute exists which necessitates non-payment to the Subcontractor. If a performance dispute exists, the prime Contractor must demonstrate that there is a valid basis to withhold payment from the Subcontractor. If the prime Contractor withholds payment from a Subcontractor, the prime Contractor shall provide to the Subcontractor written notice of the withholding of payment. The notice shall detail the reasons for withholding payment as well as the amount. A copy of the notice shall be provided to the Surety and the Authority. If no valid dispute exists, the prime Contractor will be directed to make immediate payment to the Subcontractor. The Subcontractor will be responsible for notifying the Chief of Construction if this payment is not made. Upon receipt of notification, the Chief of Construction will schedule a meeting with the Contractor and Subcontractor to verify and discuss the non-payment issue. This meeting will be held at the Authority's offices within 2 working days of the MdTA's contact with the subcontractor. If it is determined that the prime Contractor has withheld payment to the Subcontractor without cause, further progress payments to the prime Contractor will be withheld until the Subcontractor is paid. In addition, the MdTA may order a suspension of work or other administrative actions as it sees fit.

If an action is taken as stated above the Contractor shall notify the MdTA's Project Engineer when payment is made. After the MdTA's Project Engineer verifies that payment has been made to the Subcontractor the MdTA shall release withheld progress payments.

Nothing in this Special Provision shall be construed to prevent the Subcontractor from pursuing a claim with the surety under the prime Contractor's payment bond at any time.

SP 1-5 WORK HOURS

The Contractor will be permitted to work Monday through Friday 7:00 a.m. until 4:30 p.m. Additional hours may be permitted if approved by the Maryland Transportation Authority.

SP 1-6 INSURANCE

TC-5.01 INSURANCE

Section TC 5.01 of the Standard Specifications is supplemented as follows:

1. The Contractor shall not commence work under this contract until he has obtained all of the minimum amounts of insurance required by these Special Provisions and the insurance has been approved by the Engineer. The Contractor shall furnish to the



Maryland Transportation Authority ("Authority") duly executed certification of all required insurance on forms satisfactory to the Authority. The certificates of insurance shall state that it is in force and cannot be cancelled, release or non-renewed except upon thirty (30) days prior written notice, registered mail to the Authority. All Contractors' insurance policies, with the exception of the Worker's Compensation and Employer's Liability, shall be endorsed to provide as additional insureds the Maryland Transportation Authority and the State of Maryland.

2. The Contractor shall purchase and maintain such insurance as is specified herein which will provide the Authority, its members, employees and agents, as well as the Contractor from claims which may arise out of or as a result of the Contractor's operations under this contract, whether such operations be by the Contractor, by any subcontractor, by anyone directly or indirectly employed by any of them or by anyone whose acts any of them may be liable. This insurance shall be maintained in full force until the Contract has been accepted by the Authority and final payment is made.
3. The Authority requires the following minimum levels of insurance coverage for this contract:

a) Worker's Compensation and Employer's Liability

The Contractor shall, at all times, maintain and keep in force such insurance as will protect him from claims under the Worker's Compensation Act of the State of Maryland and maintain and keep Employer's Liability Insurance at a limit of \$100,000. The Contractor shall also maintain United States Long Shore and Harbors Act coverage, if such exposure exists.

b) Comprehensive General Liability Insurance

The Contractor shall maintain Comprehensive General Liability Insurance in the amount of at least One Million Dollars (\$1,000,000) Combined Single Limit for Bodily Injury Liability and Property Damage Liability Insurance per occurrence and in the aggregate. Such insurance shall specifically include the Comprehensive General

Liability Broad Form Endorsement and indicate explosion, collapse, and underground damage coverage.

c) Comprehensive Automobile Liability Insurance

The Contractor shall maintain Comprehensive Automobile Liability Insurance (including all automotive equipment owned, operated, rented, or leased), in the amount of at least Five Hundred Thousand (\$500,000) Combined Single Limit for bodily injury and property damage.



d) Additional Insurance

The Contractor shall also procure and keep in effect:

Excess liability (umbrella coverage) in excess of and applicable to the coverage in the Comprehensive General Public Liability and Property Damage Insurance, "X, C, U" and Comprehensive Automobile Insurance in the amount of at least Two Million Dollars (\$2,000,000) for each occurrence.

4. Accident Notification - The Contractor shall send a written report to the Engineer and to the Maryland Transportation Authority within twenty-four (24) hours of any accident or other event arising in any manner from the performance of the contract which results in or might result in personal injury or property damage.
5. Failure to comply with these Special Provisions may lead to termination from default/convenience.
6. There will be no special payment for the insurance as required by this contract and all costs incidental thereto shall be included in the (Lump Sum for "Mobilization", (refer to Section 108), or if the Contract does not include such an item, the insurance costs are to be included in pay items for the Proposal.

**SP 1-7 MINORITY BUSINESS ENTERPRISE REGULATIONS GOVERNING
CONSTRUCTION CONTRACTS IN EXCESS OF \$50,000
EFFECTIVE JULY 1, 2001**

GP – 7.29 of the General Provisions is supplemented as follows:

MBE participation goal for this contract is as indicated in these Special Provisions.

The Contractor shall:

1. Identify specific work categories appropriate for subcontracting;
2. At least 10 days before bid opening, solicit Minority Business Enterprises, through written notice that:
 - a) Describe the categories of work: and,
 - b) Provide information regarding the type of work being solicited and specific instructions on how to submit a bid.
3. Attempt to make personal contact with Minority Business firms:



4. Assist Minority Business Enterprises to fulfill bonding requirements or to obtain a waiver of these requirements:
5. Upon acceptance of a bid, provide the Maryland Transportation Authority (MdTA) with a list of Minority Businesses with whom the Contractor negotiated, including price quotes from Minority and Non-minority firms.

Third Tier Subcontracting:

Third Tier MBE/DBE Subcontracting will be approved by MdTA only when MdTA is satisfied that there is no way except by Third Tier contracting that an MBE/DBE goal can be achieved. The Contractor's written request must be submitted prior to contract award and contain specifics as to why a Third Tier contracting agreement is being requested.

Waivers:

If for any reason the bidder/offeree is unable to achieve the specified overall contract goal or subgoals for each certified MBE classification, the bidder/offeree must request, in writing, on Attachment A, (Certified MBE Utilization and Fair Solicitation Affidavit), a waiver a time of bid.

Strict adherence regarding documentation of the rationale for the waiver request and documentation of "Good Faith Efforts" of the Contractor are required for consideration of any waiver. For additional information on waivers, please see *COMAR 21.11.03.11*

Criminal Fraud Provisions:

All Contractors are reminded that Criminal Fraud Provision and Administrative Sanctions may be imposed for failure to achieve and maintain established MBE/DBE goals.

SP 1-8 PROGRESS SCHEDULE REQUIREMENTS

Refer to Section 110 of the Standard Specifications.

SP 1-9 CORPORATE REGISTRATION

A foreign corporation is any corporation not incorporated under the Laws of the State of Maryland. All foreign corporations, prior to performing any services for the Authority, must register with the Maryland State Department of Assessment and Taxation in compliance with Article 23, Section 90, Annotated Code of Maryland. Compliance is required of the successful vendor as well as the proposed subcontractors.



To accomplish the required registration, a foreign corporation must request and complete "Qualification Application Forms" which can be obtained from the Department of Assessment and Taxation, State Office Building, Room 803, 301 West Preston Street, Baltimore, Maryland 21201. Forms can be obtained via web site at e-mail address: www.dat.state.md.us.

The Contractor will be responsible for documenting compliance with the aforesaid. This documentation will be required prior to the execution of a contract with the successful bidder.

SP 1-10 CONTRACTOR'S EMPLOYEE IDENTIFICATION

The Contractor shall provide to the Authority, a list containing the following for Contractor and all sub-contractors that would be working at the site. This shall include trucking companies who would come to the site on a repetitive basis for supply or remove materials:

- Name of Company
- Name and title of contact person
- Address of the Company
- Phone Number
- Facsimile number
- E-Mail address of contact person (if any)

All Contractor's employees, including employees of subcontractors, on this project, present at the site, shall be in possession of a valid employee identification card provided by the Employer, which shall contain a photograph and identify the employee by name and job title. The employee must produce the said identification if required by the Engineer or the Authority Police.

When working in or around the Authority's buildings, said employees identification shall be displayed at all times.

While working on the transportation facility projects of the Authority, Contractor's personnel shall have an ID decal displayed on their hardhat. These decals will be provided by the Authority. All Contractors' vehicles shall have a parking decal, attached to the rear view mirror. These parking decals will also be provided by the Authority and a distribution list will be maintained. AT the time of project completion these decals shall be returned to the Authority. Request for hardhat and rearview mirror decals shall be made to the Construction Section before the beginning of construction and should include the number required of each type.

All costs associated with ID's will not be paid for separately and shall be incorporated under other items of payment in the contract.



**GENERAL PROVISIONS
GP-SECTION 1
DEFINITIONS AND TERMS**

GP 1.03 – ORGANIZATIONAL DEFINITIONS

Revise the definitions of Administration to read as follows:

Administration – The word “Administration” shall mean “Maryland Transportation Authority”.

Except for Office of Materials and Research, all references to the Maryland State Highway Administration’s offices and positions shall mean the Authority’s corresponding offices and positions.



**GENERAL PROVISIONS
GP-SECTION 1
DEFINITIONS AND TERMS**

GP-1.04 ABBREVIATIONS

GP3 **ADD:** The following after SAWP

SSPC Steel Structures Painting Council

GP-1.05 DEFINITIONS

GP7 **ADD:** The following after State.

Subcontract—Any agreement entered into by the Contractor or a subcontractor for a portion of the construction or any other part of the work in connection with, and under the terms of, the Contract.

DELETE: The Subcontractor definition in its entirety.

INSERT: The following.

Subcontractor—Any person undertaking a portion of the construction or any other part of the work under the terms of the Contract, by virtue of an agreement with the Contractor or a subcontractor, who prior to such undertaking has received the approval of the Administration. Subcontractor does not include an employee with an employment contract, or an employee organization with a collective bargaining agreement.

ADD: The following after Surety.

Third Tier Contracting—The process in which the Contractor subcontracts a portion of the Contract to a subcontractor who in turn subcontracts a portion of a subcontract to a third party. This latter action is termed entering into a third tier Contract.



**GENERAL PROVISIONS
GP- SECTION 1
DEFINITIONS AND TERMS**

GP 1.05 - DEFINITIONS

Add the following definitions:

Highway Standards - The official Book of Standards for Highway and Incidental Structures, edited by the State Highway Administration, with the latest incorporated revisions issued on or before the date of advertisement on the contract.

**GENERAL PROVISIONS
GP-SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS**

GP 2.04 SITE INVESTIGATION

Revise the paragraph to read as follows:

The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the work, including but not restricted to those bearing upon transportation, disposal, handling, and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, tides, or similar physical conditions at the site, and confirmation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as the information is reasonably ascertainable from an inspection of the site, including all exploratory INFORMATION IN POSSESSION OF THE STATE, as well as from information presented by the drawings and Specifications made part of this contract. Any failure by the Contractor to acquaint himself with the available information may not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The State assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the State.

**GENERAL PROVISIONS
GP-SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS**

GP-2.06 PREPARATION OF THE BID

GP9 **ADD:** After paragraph (a), the following.

The Contractor may elect to submit his bid on forms he has generated in the development of his bid. These may be submitted in lieu of the schedule of prices bid forms furnished by the Administration in the Invitation for Bids. These forms shall emulate the forms currently furnished by the Administrations and, as a minimum, contain the following information.

- (1) State Contract No.
- (2) State Item Nos.
- (3) State's Proposed Quantities
- (4) Description of Items
- (5) Unit Price
- (6) Total Cost of Each Item
- (7) Total Bid Amount

The document shall be 8-1/2 x 11 inches, and oriented in a landscape format. The font size shall be no less than 10 points with horizontal lines dividing each item. Any addendum which revised items or quantities shall be noted on all affected schedule of prices sheets. Any special bid requirements that are noted in the schedule of prices shall also be listed on the form.

Should the Contractor elect to submit bids on the Contractor's own forms, the Contractor shall submit a sample of the form to the Administration at least two weeks prior to the scheduled opening of bids. The use of Contractor generated forms shall be approved, in writing, prior to their use. If the Contractor's forms were previously approved in writing on another Administration project and have not changed, they need not be resubmitted for this project.

Sample forms shall be submitted to:

Ms. Linda McGill
Chief Procurement Officer
Maryland Transportation Authority
300 Authority Drive
Baltimore, MD 21222



**GENERAL PROVISIONS
GP-SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS**

GP 2.23 - BID PROTESTS

Section GP 2.23 of the General Provisions is supplemented as follows:

The Board of Public Works does not have the jurisdiction to consider protests relating to this solicitation or an award of this contract under this solicitation.

All protests relating to this solicitation, the selection, and/or award must be filed in writing with the Authority's Procurement Officer, within the time limitations set forth in COMAR 21.10.07 and 21.10.02. Bid protests shall be filed not later than 7 days after the basis for protest is known, or should had been known, whichever is earlier. Oral protests will not be considered.

The specific details of the protest procedures shall be followed by aggrieved actual or prospective bidders or offerors are contained in COMAR 21.10.



**GENERAL PROVISIONS
GP SECTION 4
SCOPE OF WORK**

GP 4.10 - WARRANTY OF CONSTRUCTION

GP 4.10 of the Standard Specifications is revised to read as follows:

Delete: The first paragraph in its entirety.

Insert: The following:

The Warranty as defined under paragraphs (a) through (g) in GP 4.10 "Warranty of Construction" shall apply to this Maryland Transportation Authority contract unless specified elsewhere in this Invitation for Bids.

**GENERAL PROVISIONS
GP SECTION 5
CONTROL OF WORK**

GP 5.12 - FAILURE TO MAINTAIN ENTIRE PROJECT

Delete: Section GP 5.12 in its entirety

Insert: Revise the paragraph to read as follows:

Failure on the part of the Contractor, at any time, to comply with the provisions of GP 5.11 above, will result in the procurement officer's immediately notifying the Contractor to comply with the required maintenance provisions. In the event that the Contractor fails to COMPLETE CORRECTIONS SO AS TO CONFORM TO THE PROVISIONS OF GP 5.11 within four (4) hours of receipt of such notice, the procurement officer MAY NOTIFY THE CONTRACTOR TO SUSPEND ALL OTHER WORK ON THE CONTRACT UNTIL SUCH TIME AS THE UNSATISFACTORY MAINTENANCE IS CORRECTED. In the event that the Contractor fails to COMPLY WITH GP 5.11 within four (4) hours after receipt of such notice, the procurement officer will immediately proceed with adequate forces and equipment to maintain the project, and the entire cost of this maintenance will be deducted from monies due the Contractor ON THE NEXT MONTHLY ESTIMATE.

**GENERAL PROVISIONS
GP SECTION 8
PROSECUTION AND PROGRESS**

GP 8.09 - LIQUIDATED DAMAGES

Delete: Section GP 8.09 in its entirety

Insert: Time is an essential element of the Contract and it is important that the work be vigorously prosecuted until completion.

For every calendar day that the contract remains uncompleted after the expiration of the contract time specified herein, or amended by extra work authorization, change orders or supplemental agreements, the Contractor will be liable for Liquidated Damages. The amount of Liquidated Damages shall be as specified in Contract Time and Bonding. This amount shall be deducted from any money due the Contractor, not as a penalty, but as Liquidated Damages. Damages in excess of any retained percentage shall be paid to the Authority by the Contractor.

Refer to Contract time and Bonding sheet contained elsewhere herein. See Table of Contents.



**GENERAL PROVISIONS
GP SECTION 9
PAYMENT**

GP 9.05 LATE PAYMENTS

ADD the following:

- (e) Payments will be made within thirty (30) days of the date when the contract amount becomes due and payable or the date of receipt of a proper invoice, whichever is later. The State's failure to remit payment within forty-five (45) days from that date may entitle the Contractor to interest at the rate of 9% per annum beginning on the 31st day.



**TERMS AND CONDITIONS
TC SECTION 4
CONTROL OF WORK**

TC 4.01 - SHOP PLANS AND WORKING DRAWINGS

Section TC 4.01 of the Specifications is amended to add:

All shop plans and working drawings for this project shall be submitted to:

Maryland Transportation Authority
Engineering Division
300 Authority Drive
Baltimore, Maryland 21222-2200
ATTN: Mr. John Jewell

The Contractor shall allow a minimum of four (4) weeks turn around time on all drawings from the date they are received by the Authority. All shop plans and working drawings shall be reviewed and approved by the Contractor prior to submitting for approval to the Maryland Transportation Authority and shall be submitted by the general Contractor only. No drawings sent to the Authority directly by subcontractors, fabricators, etc. will be accepted. Ten (10) sets of drawings shall be submitted for approval.

Acceptance of a material source by the Engineer does not constitute approval of the material as a substitute as an "equal". Submission of a material as an "or equal" must be done in accordance with the following paragraphs:

All shop drawings, regardless if "Submitted as Specified" or "Submitted as Equal to Specified", shall be furnished with complete, specific, detailed information from the manufacturer or supplier or the material or equipment the Contractor proposes to furnish, in which the requirements of the Specifications are clearly shown to be met. This shall include a point by point comparison with the detail requirements of the Specifications.

When any article is specified by trade name of manufacturer with or without the clause "or equal", it is intended to establish the quality of the article. If the Contractor proposes to use material or equipment of another manufacturer as an "or equal" to material or equipment specified, all shop drawings shall conform to the following requirements, conditions, and procedure:

1. Substitution of equipment or materials other than those specified will be considered, providing, in the opinion of the Engineer, such equipment or material

is equal to, or better than specified. The decision of the Engineer with respect to approval or disapproval of any material or equipment proposed to be substituted as an "or equal" is final. The Contractor shall have no claim of any sort by reason of such decision.

2. If the Contractor proposes to substitute materials or equipment as "or equal" to those specified, it shall be his responsibility to furnish, in addition to the information discussed above, a point by point comparison of the material or equipment specified under the Contract and that proposed to be substituted. The burden of responsibility in furnishing this information is with the Contractor.

If incomplete or irrelevant data is submitted as evidence of compliance with this section of the Specifications, the data will be returned and the request for approval will be denied.



**TERMS AND CONDITIONS
TC SECTION 5
LEGAL RELATIONS AND PROGRESS**

TC-5.01 INSURANCE.

17 **DELETE:** The first three paragraphs under TC-5.01 in their entireties.

INSERT: The following.

The requirement of GP-7.14 (Liability Insurance) to submit Certificate of Insurance prior to starting work is modified for Administration Contracts to require the certificate of insurance to be submitted prior to the execution of the Contract.

The Contractor shall maintain in full force and effect third party legal liability insurance necessary to cover claims arising from the Contractor's operations under this agreement which cause damage to the person or property of third parties. The insurance shall be under a standard commercial general liability (CGL) form endorsed as necessary to comply with the above requirements; or other liability insurance form deemed acceptable by the State. The State of Maryland shall be listed as an additional named insured on the policy. The limit of liability shall be no less than \$1,000,000 per occurrence/\$2,000,000 general aggregate. The insurance shall be kept in full force and effect until all work has been satisfactorily completed and accepted. The policies shall be endorsed to provide 30 days notice of cancellation or non-renewal to:

Director of Construction
Maryland Transportation Authority
304 Authority Drive
Baltimore, Maryland 21222



**TERMS AND CONDITIONS
TC SECTION 6
RESTRICTIONS AND PERMITS**

TC-6.03 COMPLIANCE WITH MARYLAND VEHICLE LAWS.

The Maryland Vehicle Law requires each motor vehicle, trailer, semitrailer and pole trailer driven on a highway to be registered.

There are some exceptions to this general requirement concerning nonresidents. If a nonresident is operating a vehicle(s) in Maryland as described below, the nonresident exemption is not applicable and the vehicle(s) being operated shall be titled and registered in conformance with the applicable Motor Vehicle Laws.

The vehicle is:

- (a) Used for transporting persons for hire, compensation, or profit
- (b) Regularly operated in carrying on business in this State
- (c) Designed, used, or maintained primarily for the transportation of property, or
- (d) In the custody of any resident for more than 30 days during any registration year.

In addition to the titling and registration requirements for vehicles being operated in Maryland, all equipment being used shall be properly identified. Maryland classifies this equipment as "Special Mobile Equipment" which is defined as a vehicle that:

- (a) Is not used primarily for highway transportation or property; and
- (b) Is operated or moved on highway only as an incident to its nonhighway use.

Special mobile equipment includes a road construction or maintenance machine, mobile crane, ditch digger, well driller, concrete mixer, jobsite office vehicle or portable power generator.

An interchangeable license plate is issued to special mobile equipment. However, titling is not required.

For additional information concerning the requirements for titling and registering your vehicles in Maryland, please contact the Motor Vehicle Administration, Chief, Division of Vehicle Registration.

The Contractor shall adhere to all State Motor Vehicle laws and safety regulations.



**TERMS AND CONDITIONS
TC SECTION 6
RESTRICTIONS AND PERMITS**

25 **DELETE:** TC-6.09 HAZARDOUS MATERIAL in its entirety.

INSERT: The following.

TC-6.09 HAZARDOUS MATERIAL.

- (a) If the Contractor encounters or exposes during construction any abnormal conditions, which indicate the presence of a hazardous material or toxic waste, work in the area shall immediately be suspended and the Engineer notified. The Contractor's operations in this area shall not resume until permitted by the Engineer, however, the Contractor may continue working in other areas of the project, unless directed otherwise.

Abnormal conditions shall include, but not be limited to the presence of barrels, obnoxious or unusual odors, excessively hot earth, smoke, or any other condition which could be a possible indicator of hazardous material or toxic waste.

Where the Contractor performs necessary work required to dispose of these materials and no items have been identified in the Contract Documents, the work shall be performed under an extra work order.

- (b) For any material furnished on the project by the Contractor suspected to be hazardous or toxic the Engineer may require the Contractor to have it tested and certified to be in conformance with all applicable requirements and regulations. Material found to be hazardous or toxic shall not be incorporated into the work. The required testing will be determined by the Engineer and may include, but not be limited to, the EPA Toxicity Characteristic Leaching Procedure (TCLP) or its successor. The evaluation and interpretation of the test data will be made by the Engineer. Testing and certification shall be at no additional cost to the Administration.
- (c) Disposition of the hazardous material or toxic waste shall be made in conformance with all applicable requirements and regulations.



SPECIAL PROVISIONS INSERT

TC 6.10 — RECYCLED OR REHANDLED MATERIAL

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TERMS AND CONDITIONS

**TC SECTION 6
RESTRICTIONS AND PERMITS**

112 **DELETE:** TC 6.10 – RECYCLED OR REHANDLED MATERIAL in its entirety.

INSERT: The following.

TC 6.10 – RECYCLED OR REHANDLED MATERIAL.

Refer to 900.03 in the Contract Documents.

TERMS AND CONDITIONS
TC SECTION 7
PAYMENT

29 **DELETE:** TC-7.02 PAYMENT ALLOWANCES FOR STORED MATERIALS in its entirety.

INSERT: The following.

TC-7.02 PAYMENT ALLOWANCES FOR STORED MATERIALS.

When the Contractor requests payment allowance for materials, the following terms and conditions shall apply:

- (a) For superstructure members delivered on the project site, an allowance of 100 percent of the material cost plus freight charges as invoiced may be made provided the cost does not exceed 90 percent of the Contract price of the applicable Contract item. The allowance will be based upon validated invoices or bills for material including freight charges, and a copy thereof shall be made a part of the documented records for the project.
- (b) For reinforcement steel, piling, pipe, traffic barrier, signs and sign assemblies, and other nonperishable material in storage on the project, but excluding aggregates, cement, seed, plants, fertilizer or other perishable items, an allowance of 100 percent of the invoiced cost of the material plus freight charges to the Contractor may be made provided the cost does not exceed 90 percent of the Contract price of the applicable Contract item. Such material shall be delivered and stock-piled at the project site, and have been tested by the Administration and found to have conformed to the Specifications or have been accepted under an approved certification program prior to the allowance.
- (c) No allowance will be made for fuels, form lumber, falsework, temporary structures or other materials of any kind which will not become an integral part of the finished construction.

No payment for stored material will be made if it is anticipated that the material will be incorporated into the work within 30 days of the written request.

Only end product manufactured material or fully fabricated products that are awaiting installation or incorporation into the finished work are eligible for prepayment. Components, elements, or ingredients of a finished product are not eligible for prepayment.

- (d) Material for which an allowance is requested shall be stored in an approved manner in areas within the State of Maryland where damage is not likely to occur. If any of the stored materials are lost or become damaged in any manner, the Contractor shall be responsible for repairing or replacing the damaged materials. The value of the

lost or damaged material will be deducted from the Contractor's subsequent estimates until replacement has been accomplished. The request for allowances for any materials stored on private property within the State of Maryland shall be accompanied by a release from the owner and/or tenant of such property agreeing to permit the removal of the materials from the property without cost to the State of Maryland.

The material shall be clearly marked with the Administration's Contract number on individual units. If the material is normally shipped to the project in bundles or other forms of packaging, the Administration's Contract number shall be clearly marked or affixed to the package. When the material is not stored at the actual project site, the material shall be physically separated by fencing or equivalent barrier from other materials stored at the same site. The material shall be accessible to the Administration at all times.

When it is considered impractical to store materials on the actual project, the Engineer may approve storage areas in the vicinity of the actual project which will be considered at the project site.

When storage of the materials within the State of Maryland is not practical, approval shall be obtained from the District Engineer for storage elsewhere. Storage of materials outside the State of Maryland will be subject to the conditions set forth in this provision and limited to materials exceeding twenty-five thousand dollars (\$25 000), which are designed and fabricated exclusively for use on a specific project.

- (e) Material for which payment has been made, either wholly or partially, shall not be removed from the approved location until such time that it is to be incorporated into the work unless authorized by the Engineer.
- (f) The Contractor shall submit a written request for payment to the District Engineer at least two weeks prior to the estimate cutoff date established by the District Engineer. The following items shall accompany the written request for payment:
 - (1) Consent of surety specifying the material type and the item(s) in which the material is to be used.
 - (2) Validated invoices with the signature of an officer of the company supplying the material showing actual cost.
 - (3) A notarized statement from the Contractor attesting that the invoices as submitted do not include charges or fees for placing, handling, erecting or any other charges or markups other than the actual material cost, sales tax(es), if applicable, and freight charges.
 - (4) Bills of lading showing delivery of the material. The request for allowances for any materials stored on property outside the State of Maryland shall be accompanied by a release from the owner or tenant of such property agreeing to

permit verification by the Inspector that the material is stored at the approved location, and to permit the removal of the materials from the property without cost to the State of Maryland.

- (5) Inspection test reports, certifications and/or a written statement from the Inspector attesting to the inspection and approval of the material.

Upon receipt of the above by the District Engineer and verification by the Inspector that the material is stored at the approved location, the District Engineer will authorize payment.

- (6) A statement explaining why the material can not be stored on the project, if the Contractor is requesting to store material at a location other than the project site. The statement shall include the methods of storage, separation, and identification to be used by the Contractor. The Contractor shall provide a method of inventory control and withdrawal satisfactory to the Administration which shall be used by the Contractor to monitor materials not stored on the project.

- (7) A breakdown of the Contract line item bid unit price showing the relationship of the cost of the stored material to the costs of all other materials, labor, and components of the work included in the Contract line item unit price bid by the Contractor.

Upon receipt of the above by the District Engineer and verification by the Inspector that the material is stored at the approved location, the District Engineer will authorize payment.

The Contractor shall pay the material provider the amount shown on the invoice within 10 calendar days of receipt of payment from the Administration. Evidence of payment shall be provided to the Administration. Failure to make invoice payments as specified will be cause to deduct the monies from future estimates and/or deny future stored materials payment requests.

Copies of all pertinent data shall be made by the Contractor and distributed to the Inspector for retention as part of the documented records for the project.

TC-7.03 FORCE ACCOUNT WORK.

(e) Subcontracting.

35 **ADD:** The following to the end of the paragraph.

"or five hundred dollars (\$500) which ever sum is greater."

DELETE: TC-7.05 PROGRESS PAYMENTS Subsection (a) (3) Variable Retainage

INSERT: The following.

- (3) **VARIABLE RETAINAGE.** The Contract will be subject to a variable retainage based upon the Authority's performance evaluations of the Contractor.

Those qualifying may have retainage reduced upon request of the Contractor with consent of surety. This request must be processed through the Construction Manager. If at any time during the performance of the project, the evaluation of the Contractor changes, retainage reduction may be reconsidered.

Contractors with "A" evaluations for the last two years may be reduced from 5 percent to 2.0 percent upon request after 15 percent project completion. Project completion percentage will be based upon actual work completed (excluding monies paid for stored materials). An interim evaluation of the current project must be completed and must be an "A". Contractors with "A" evaluations for the last two years may petition to have all retainage at that point released upon completion of a significant milestone. Retainage will continue at 2.0 percent until the next milestone of completion of the contract.

Contractors with "B" evaluations or any combination of "A" and "B" evaluations for the last two years may be reduced from 5 percent to 2.5 percent at 50 percent project completion and remain at that level until released upon final payment. Project completion percentage will be based upon actual work completed (excluding monies paid for stored materials). An interim evaluation of the current project shall be completed and shall be an "A" or "B".

Contractors with "C" evaluations or any combination of "C" and "D" evaluations for the last two years will begin and remain at 5 percent for the life of the project. An interim evaluation of the current project shall be completed and shall be a "C" or better rating.

Contractors with a "D" evaluation for the last two years will begin at 5 percent. Project performance will be evaluated monthly. Should the contractor performance remain at the "D" level, to protect the State's interest 10% of the progress payment will be withheld until performance improves to a "C".

New Bidders. Contractors who have not been previously rated by the Authority may be eligible for a reduction in retainage. To be eligible, their past performance on highway and bridge work shall be documented by the government agency with whom they had a contract and their performance shall be documented on Authority forms.

All other Contractors who do not fit into the above criteria would require a 5 percent retainage throughout the life of the Contract.



SECTION 100-1 - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 Project/Work Identification

The work of this Section consists of removing and disposing of all Asbestos Containing Materials (ACM) from the roof at the Point Breeze Garage that are anticipated to be disturbed by roofing activities, and necessary to comply with referenced regulations prior to other work defined in other section(s) of the Contract Documents. In addition to summarizing the work of this Project, this Section is designed to supplement other sections. Where the requirements of this Section may be more stringent than other sections, this Section shall prevail. The Contractor must be aware that the building will remain occupied during the asbestos abatement project.

All ACM removal must be performed in compliance with following standards and guidelines:

1. Code of Maryland Regulations (COMAR) 09.12.31 (Maryland Occupational Safety and Health Act), and 26.11.21 (Control of Asbestos).
2. 29 Code of Federal Regulations (CFR) 1926 (OSHA Safety and Health Standards for the Construction Industry), particularly 29 CFR 1926.1101 (Asbestos).
3. 40 CFR 61, EPA National Emission Standard for Hazardous Air Pollutants, (Asbestos).
4. All pertinent federal, state and local waste transport and disposal regulations, including those of any jurisdiction through which waste is transported and the location of disposal.

Disclaimer: It should be noted that all of the findings and conclusions of Design Engineer's investigation may not be based on scientific certainties, but rather probabilities based on professional judgement. Design Engineer is not able to represent that the site contains no asbestos beyond those detected or observed during the site investigation. The Contractor will also be fully responsible for any additional ACM that he may encounter during abatement process and during renovation. The Contractor shall



remove and dispose of the site such ACM in accordance with all applicable federal, state, and local requirements.

1.2 Definitions Related to Asbestos Abatement

- a) Accredited or Accreditation (when referring to a person or laboratory): A person or laboratory accredited in accordance with Section 206 Title II of the Toxic Substances Control Act (TSCA).
- b) Aerosol: A system consisting of particles, solid or liquid, suspended in air.
- c) Air Cell: Insulation normally used on pipes and ductwork that is comprised of corrugated cardboard which is frequently comprised of asbestos combined with cellulose or refractory binders.
- d) Air Monitoring: The process of measuring the fiber content of a specific volume of air.
- e) Amended Water: Water to which a surfactant has been added.
- f) Asbestos: The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non-asbestiform varieties of the above minerals shall be considered as asbestos.
- g) Asbestos-Containing Material (ACM): A material containing more than 1% by weight of asbestos of any type or mixture of types.
- h) Asbestos-Containing Building Material (ACBM): Surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building.
- i) Asbestos-Containing Waste Material: Any material which is or is suspected of being or any material contaminated with an asbestos-containing material which is to be removed from a work area for disposal.
- j) Asbestos Debris: Pieces of ACBM that can be identified by color, texture, or composition, or means dust, if the dust is determined by an accredited inspector to be ACM.



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- k) Authorized Visitor: The Owner, the Owner's Representative, testing lab personnel, the Architect/Engineer, emergency personnel, or a representative of any federal, state and local regulatory or other agency having authority over the project.
- l) Barrier: Any surface that seals off the work area to inhibit the movement of fibers.
- m) Breathing Zone: Any surface that seals off the work area to inhibit the movement of fibers.
- n) Ceiling Concentration: The concentration of an airborne substance that shall not be exceeded.
- o) Certified Industrial Hygienist (C.I.H.): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene. (Not required on site).
- p) Demolition: The wrecking or taking out of any building component, system, finish or assembly of a facility together with any related handling operations.
- q) Disposal Bag: 6 mil thick leak-tight plastic bags used for transporting asbestos waste from the work site and to the disposal site. All disposal bags must be "true" 6 mil thickness, not "nominal" or "industrial grade" 6 mil thickness.
- r) Encapsulant: A material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent release of fibers.
- s) Bridging encapsulant: an encapsulant that forms a discrete layer on the surface of an in situ asbestos matrix.
- t) Penetrating encapsulant: an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer.
- u) Removal encapsulant: a penetrating encapsulant specifically designed for removal of asbestos-containing materials rather than for in situ encapsulation.
- v) Encapsulation: Treatment of asbestos-containing materials with an encapsulant.



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- w) Enclosure: The construction of an air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.
- x) Filter: A media component used in respirators to remove solid or liquid particles from the inspired air.
- y) Friable Asbestos Material: Material that contains more than 1.0% asbestos by weight, and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.
- z) Glovebag: A bag (typically constructed of 6 mil transparent polyethylene or polyvinylchloride plastic) with two inward projecting longsleeve gloves, which are designed to enclose an object from which an asbestos-containing material is to be removed. All glovebags must be "true" 6 mil thickness, not "nominal" or "industrial grade" 6 mil thickness.
- aa) HEPA Filter: A High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in length.
- bb) HEPA Filter Vacuum Collection Equipment (or vacuum cleaner): High efficiency particulate air (absolute) filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.
- cc) High-Efficiency Particulate Air Filter (HEPA): Refers to a filtering system capable of trapping and retaining 99.97% of all monodisperse dioctyl phthalate (DOP) particles having a mean particle diameter of 0.3 um in diameter or larger.
- dd) Negative Pressure Respirator: A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
- ee) Negative Pressure Ventilation System: A local exhaust system, utilizing HEPA filtration capable of maintaining a negative pressure inside the work area and a constant air flow from adjacent areas into the work area and exhausting that air outside the work area.
- ff) Negative Pressure: Air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (work area).



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- gg) Personal Monitoring: Sampling of the asbestos fiber concentrations within the breathing zone of an employee.
- hh) Plastic Sheeting: All plastic sheeting must be “true” 6 mil thickness, not “nominal” or “industrial grade” 6 mil thickness.
- ii) Pressure Differential and Ventilation System: A local exhaust system, utilizing HEPA filtration capable of maintaining a pressure differential with the inside of the work area at a lower pressure than any adjacent area, and which cleans recirculated air or generates a constant air flow from adjacent areas into the work area.
- jj) Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.
- kk) Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.
- ll) Repair: Returning damaged ACBM to an undamaged condition or to an intact state as to prevent fiber release.
- mm) Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.
- nn) Time Weighted Average (TWA): The average concentration of a contaminant in air during a 8 hour time period.
- oo) Visible Emissions: Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.
- pp) Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with amended water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.
- qq) Work Areas: The area where asbestos related work or removal operations are performed which is defined and/or isolated to prevent the spread of asbestos dust,



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fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.

1.3 General Requirements

1. Contractor must have the technical qualifications, experience, employee training and manpower to perform the work in a safe, legal and expeditious manner, following all pertinent federal, state, and local regulations.
2. Time available for the asbestos abatement is included in the overall project timing.
3. In addition to the MdTA's Contractor Agreement Form insurance requirements, Contractor shall carry and maintain throughout the course of the Project asbestos liability insurance to cover the MdTA, its employees, agents and area visitors in the amount of \$2,000,000.00 per occurrence.
4. Insurance policy must be written in the "occurrence" form, with no "sunset" clauses. Policy shall have no exclusions for any related asbestos or environmental impairment liability. Contractor shall submit a Certificate of Insurance naming the MdTA as an additional insured.

1.4 Asbestos Containing Materials (ACM)

1. The Maryland Transportation Authority performed an asbestos identification survey of the areas anticipated to be disturbed by the roofing project. The following building materials have been tested and determined to contain greater than 1% asbestos, defining it as ACM by EPA definition. Determination of the actual quantities of these ACM and related ACM debris shall be the responsibility of the Contractor. In addition to the ACM described below, the Contractor shall be responsible for the proper abatement of any incidental ACM that is necessary to accomplish work of this project.

TYPE OF ASBESTOS-CONTAINING MATERIALS	APPROXIMATE LOCATION(S) POINT BREEZE GARAGE ROOF
Built-up roof flashing; 14.99% Chrysotile Asbestos	Along the parapet wall,(silver and black)
Flashing chalk ; 15.45% Chrysotile Asbestos Seam caulking; 3% Chrysotile Asbestos	On roof parapet seams and flashing, (black) Grey roof seam caulk on parapet, capstone, and brick seams



1.5 Codes and Regulations

General Applicability of Codes, Regulations, and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith.

Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all Federal, state, and local regulations pertaining to work practices, hauling, disposal, protection to workers, visitors to the site, person occupying areas adjacent to the site, and protection of the environment. The Contractor is responsible for providing medical examinations and retaining medical records of personnel as required by the applicable Federal, state, and local regulations.

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner and Owner's Representative and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) arising out of or resulting from the failure of the Contractor to comply with other regulations on the part of himself, his employees or his subcontractors.

Federal Regulations: Which govern asbestos abatement work or hauling and disposal of asbestos waste materials include, but are not limited to, the following:

OSHA: U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:

1. Occupational Exposure to Asbestos, Tremolite, Anthophyllite and Actinolite; Final Rules Title 29, Part 1910, Section 1001 and Part 1926, Section 1101 of the Code of Federal Regulations.
2. Asbestos Regulations, Title 29, Part 1910, Section 134 of the Code of Federal Regulations
3. Respiratory Protection, Title 29, Part 1910, Section 134 of the Code of Federal Regulations



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4. Construction Industry, Title 29, Part 1926 of the Code of Federal Regulations
5. Access to Employee Exposure and Medical Records, 29 CFR 1910.20
6. Hazard Communication, 29 CFR 1910.1200
7. Specifications for Accident Prevention Signs and Tags, 29 CFR 1910.145

DOT: U.S. Department of Transportation including, but not limited to:

8. Hazardous Substances, 29 CFR 171 through 177

EPA: U.S. Environmental Protection Agency (EPA) including, but not limited to:

9. National Emission Standard for Hazardous Air Pollutants (NESHAPS, National Emission Standard for Asbestos, 40 CFR 61, Sub-part A and Sub-part M (revised Sub-part B))

- ◆ State Regulations: Which govern asbestos abatement work or hauling and disposal of asbestos waste materials, include but are not limited to, the following:

1. COMAR Title 09 – Department of Licensing and Regulation

Subtitle 12 – Division of Labor and Industry

Chapter 31 – Maryland Occupational Safety and Health Act (MOSHA)

Chapter 33 – MOSH Regulations for Access to Information about Hazardous and Toxic Substances

Chapter 35 – MOSH Standard for Confined Spaces

2. COMAR Title 26 – Department of the Environment (MDE)

Subtitle 04 – Regulation of Water Supply, Sewage Disposal and Solid Waste

Chapter 07 – Solid Waste Management

Section 100-1 – Asbestos Abatement



Subtitle 11 – Air Quality

Chapter 21 – Control of Asbestos

1.6 Submittals

Plan of Action: Before the start of work, submit a plan of the procedures proposed for use in complying with the requirements of this specification. Do not begin work until written notice of this submittal is approved by the MdTA. Any changes to the work plan must be approved by the MdTA prior to implementation. Contractor shall submit the following to the MdTA prior to the start of work:

- a. Certificate of Insurance.
- b. Asbestos removal license.
- c. Training certificates and medical approval to wear negative pressure respirators for all workers who will be assigned to this phase of the Project.
- d. Schedule of activities (regulatory notification(s), mobilization, preparation, removal, cleaning and clearance) and abatement plan.
- e. Specific methods to be used to assure the safety of visitors to the site and those occupying or passing close to the work.
- f. A listing of all personal protective equipment to be required in the work area during each phase of work.
- g. Requests, or anticipated requests, for variances from MDE, if any.
- h. A disposal plan including location of approved disposal site
- i. An emergency procedures plan which specifically addresses responses to: a) unplanned releases of ACM (e.g. waste bag broken during transport, waste dumpster vandalized).

Project close-out submittals must be provided to the Authority prior to approval of final payment. This includes documentation of:

- 1) Daily supervisors logs, which must clearly indicate all activities on each day of work; a detailed description of any unusual events or non-compliance situations and



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remedies of such; a complete sign-in/out sheet for all workers, inspectors and visitors to the work site and copies of pressure differential recordings or data logging print out.

- 2) Results, including laboratory certificate(s) of any air monitoring performed for either industrial hygiene or environmental purposes.
- 3) Air monitoring data taken by the Contractor, both personal and area (a negative exposure assessment shall only be used for down-grading respirator type purpose only. Personal Air monitoring will continue throughout the duration of the project).
- 4) Documentation of MDE clearance criteria being met in each abatement area, when performed.
- 5) Documentation of waste disposal, which must include a receipt from the landfill and written certification from the Contractor, stating that all waste from this Project was disposed of as part of this receipt(s). The Contractor must comply with waste completion report requirements of the most current NESHAP regulations.

1.7 Project Oversight/Inspection

- (1) The MdTA will issue a separate contract to perform Industrial Hygiene Services to monitor the Project and collect final clearance air samples on the behalf of the MdTA. The Contractor shall provide industrial hygiene services, to perform sampling required by OSHA.
- (2) The MdTA's designated representative may perform Quality Control Inspections at any time during the work to ensure compliance with requirements of this Scope of Work. The Contractor shall fully cooperate with and assist this representative.
- (3) The MdTA's designated representative may inspect all work areas with the Contractor supervisor to ensure that no residue or asbestos material is present. Contractor shall take all actions necessary to ensure such compliance is reached as part of project completion.
- (4) Any monitoring required to comply with any regulation referenced in paragraph 1.1 or the Contractor's policies and procedures must be furnished by the Contractor as part of his scope of work for the abatement work. Compliance with 29 CFR 1926.1101 (c) requires an initial determination of airborne asbestos exposure, even when the potential



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source of exposure is a building material that is not ACM. All monitoring data shall be submitted to the office of the MdTA's representative for final report purpose.

- (5) If any additional suspect ACM is discovered, the sampling and analysis shall be performed by Accredited EPA/AHERA building inspector following the federal, state, and local regulations.
- (6) The MdTA's designated representative shall inspect all equipment brought onsite, before usage by the Contractor. This includes, but is not limited to, negative air machines, HEPA vacuum units, decontamination stage units, and any other equipment used by the Contractor.

PART 2 - PRODUCTS

2.1 General

1. All tools and equipment brought onto the job site shall be free of any asbestos residues, to ensure that the Contractor does not contaminate any portion of the site with ACM brought from another location. All tools and equipment used must be free of defects and designed for the intended use.

2.2 Scaffolding

2. Provide all scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type; or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions.
3. Equip rungs of all metal ladders, etc. with an abrasive non-slip surface.
4. Provide a non-skid surface on all scaffold surfaces subject to foot traffic.

2.3 HEPA Filtered Devices

- A. HEPA vacuums and HEPA filtered fan units shall be rated at 99.97% efficiency vs. a 0.3 micron challenge. All vacuums and fan units shall be



maintained and operated in accordance with the manufacturer's recommendations.

2.4 Water Service/Wastewater Filtration

1. Temporary Water Service Connection: All connections to the Owner's water system shall include backflow protection. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water will not damage existing finishes or equipment.
 2. Water Hoses: Employ heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each work area and to each Decontamination Unit. Provide fittings as required to allow for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.
- C. All wastewater shall be filtered through a final 1.0 micron rated filter.

PART 3 - EXECUTION

3.1 Temporary Facilities

3. The design, location(s) and construction of decontamination unit(s) shall fully comply with COMAR 26.11.21 and 29 CFR 1926.1101. Provide a personnel decontamination unit consisting of a serial arrangement of connected rooms or spaces, changing room, shower, room, equipment room. Require all persons, without exception, to pass through this decontamination unit for entry into and exiting from the work area for any purpose. Provide temporary lighting within decontamination units as necessary to reach a lighting level of 100-foot candles.
4. Changing Room (clean room): Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing.



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5. Shower Room: Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the work area from the changing room, or for showering by workers headed out of the work area after undressing in the equipment room.
6. Equipment Room (contaminated area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers. Separate this room from the work area by a 6 mil polyethylene flap doorway.
7. All power supply must be connected through ground-fault interrupter (GFI) circuits, to be furnished by the Contractor.
8. Where critical barriers and/or the entrance to a decontamination unit are in publicly accessible areas, they shall be of sturdily constructed and securely attached plywood, stud framing and a locking door or other equivalent manner to prevent entry by unauthorized personnel.
9. Signs: Post an approximately 20-inch by 14-inch manufactured caution sign at each entrance to the work area displaying the following legend with letter sizes and styles of a visibility at least equal to the following:

**Danger
Asbestos**

**Cancer and Lung Disease
Authorized Personnel Only**

**Respirators and Protective Clothing
Are Required In The Area**

10. In addition to signs and critical barriers required by COMAR 26.11.21, the Contractor shall take whatever site-specific precautions and actions are necessary to ensure security and prevent access by unauthorized persons into the asbestos work area.



3.2 Asbestos Removal Procedures

3.2.1 General

1. Work practices and personal protective equipment shall be in strict compliance with COMAR 26.11.21 and 29 CFR 1926.1101.
2. The Contractor shall not allow anyone to enter an asbestos work area without personal protective equipment required by the Work Plan and referenced regulations. Contractor shall provide all required personal protective equipment (PPE) for up to two visitors at a time. Such PPE shall be maintained in a clean, sanitary condition.
3. The Contractor shall inspect and ensure all clearance criteria required by COMAR 26.11.21 are met prior to proceeding with subsequent phases of work.
4. ACM shall be handled with care during and after removal to minimize the spread of fibers to the best extent reasonably achievable.
5. Contractor shall ensure work practices and equipment used adequately wet ACM with amended water prior to and continuously during removal. ACM shall be placed in waste bags immediately after removal and promptly transported to a secure waste container.

3.2.2 Specific

6. Removal of Class II Work

All non-friable ACM shall be removed in an intact state to the extent feasible.

Wet methods shall be used to remove non-friable materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards.

Roof level heating and ventilation air intake sources shall be isolated or the ventilation system shall be shut down.

The MdTA's designated representative will collect final clearance samples from each work area. Sample results should be less than 0.01 f/cc EPA regulations. If samples obtained are greater than 0.01 f/cc, another final clearance sampling event shall be performed after the Contractor re-cleans the work area.



3.3 Emergency Procedures

- a) Ensure the submitted emergency procedures plan is site specific, both as to site hazards and emergency services availability.
- b) During the abatement, if the MdTA's designated representative finds any indication of ACM dust, fibers or residue outside the asbestos work area, the Contractor must immediately isolate the area to prevent access by unauthorized persons and clean the area to the satisfaction of MDE. Any such responses shall be at no additional cost to the MdTA.

3.4 Waste Disposal

All waste materials resulting from the asbestos abatement work shall become the property of the Contractor and shall be disposed of by the Contractor in accordance with EPA, State and local ordinances/regulations.

3.5 Final Acceptance

- (3) Final visual inspection by the MdTA's designated representative and MDE inspector, should they choose to visit the site, shall be the basis of determination of completion of work. Final air monitoring will be required for this project.
- (4) NIOSH Method 7400: After the work area is found to be visually clean, air samples will be taken and analyzed in accordance with the procedure for NIOSH Method 7400 by the MdTA's representative.
- (5) Final acceptance is contingent upon no ACM residues being left on the project site and approval of required close-out submittals.



PART 4 - MEASUREMENT AND PAYMENT

A. The accepted quantities of all asbestos-containing roofing materials, built-up roof flashing, fibrated roof coating, roof patching cements, and any related asbestos-containing materials (ACM) will be paid for at the contract unit price per square foot or linear foot as applicable. This price shall be full compensation for furnishing of all labor, tools, materials, equipment, and waste disposal services necessary for and reasonably incidental to the completion of removal and disposal of debris from the roof at the Point Breeze Garage..

B. Payment will be made under:

100-1	Built-up roof flashing; (silver and black) 14.99% Chrysotile Asbestos	2000 SF
100-2	Flashing chalk; 15.45% Chrysotile Asbestos	480 LF
100-3	Seam chalking; 3% Chrysotile Asbestos	1600 SF

END OF SECTION



**CATEGORY 100
PRELIMINARY**

SECTION 108 — MOBILIZATION

108.01 DESCRIPTION.

This work shall consist of the construction preparatory operations, including the movement of personnel and equipment to the project site and for the establishment of the Contractor's offices, buildings, and other facilities necessary to begin work.

108.02 MATERIALS. Not applicable.

108.03 CONSTRUCTION.

All work performed in providing the facilities and services shall be done in a safe and workmanlike manner.

108.04 MEASUREMENT AND PAYMENT.

Mobilization will not be measured but will be paid for at the Contract lump sum price for item 108. The cost of all required insurance and bonds will be incidental to the Mobilization item.

Payment of 50 percent of the Mobilization item will be made in the first monthly estimate after the Contractor has established the necessary facilities. The remaining 50 percent will be prorated and paid in equal amounts on each of the next four monthly estimates. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Payment of the Mobilization item will not be made more than once, regardless of the fact that the Contractor may have, for any reason, shut the work down on the project, moved their equipment away from the project and then back again.

If an item for mobilization is not provided, the cost of mobilization including the required insurance and bonds will be incidental to the other items specified in the Contract Documents.



CATEGORY 100
PRELIMINARY

SECTION 113 — DIGITAL CAMERA

113.01 DESCRIPTION. Furnish and maintain new or like-new digital cameras for use by Administration personnel. Furnish one color inkjet printer. The digital cameras and printer shall be delivered to the Engineer at the time of the Notice to Proceed. They shall remain operational and not be returned to the Contractor until final acceptance of the entire project, in conformance with GP-5.13.

113.02 MATERIALS.

- (a) **Digital Camera.** Each digital camera shall meet the following requirements and be furnished with the specified accessories:
- (1) Windows XP PRO XP2 compatible operating system.
 - (2) Photo Suite, Photo Deluxe, Picture Works, Photo Shop, or similar Photo Managing Software.
 - (3) 4.0 megapixel image resolution (minimum).
 - (4) 3X optical zoom (minimum).
 - (5) Two (2) sets of rechargeable batteries.
 - (6) SmartMedia Card or memory stick (2 GB minimum).
 - (7) Pop-up or built-in flash modes.
 - (8) All items required for quick downloading.
 - (9) Auto-quick focus.
 - (10) Lens Cover, Shoulder Strap, and Carrying Case.
 - (11) AC adapter and Battery Charger.
- (b) **Color Inkjet Printer.** The printer shall conform to the following minimum requirements:
- (1) Resolution of 2400 x 1200 DPI (dots per inch).



SPECIAL PROVISIONS
113 — DIGITAL CAMERA

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- (2) Print speed of 17 PPM (pages per minute) for black and white and 13 PPM for color.
- (3) Memory 8 MB.

- (4) Duty cycle of 5000 pages/month.

Office-jets and Bubble-jets will not be accepted.

113.03 CONSTRUCTION. Not applicable.

113.04 MEASUREMENT AND PAYMENT. The number of digital cameras required for this project is 1. The digital cameras and printer will not be measured but the cost will be incidental to the Contract price for the Engineers Office item. If an item for Engineers Office is not specified, payment will be incidental to the payment for Mobilization. In the absence of either item, payment will be incidental to the other items specified in the Contract Documents. If a digital camera or printer becomes defective, is stolen, or for any other reason does not function as intended, it shall be replaced with an approved camera or printer at no additional cost to the Administration. A nonfunctioning or stolen camera or printer shall be replaced within 5 days after the Engineer notifies the Contractor.

Ownership of the cameras and printer will remain with the Contractor. The Administration assumes neither responsibility nor liability for the condition of the camera when returned.



SUMMARY OF WORK

PART 1 – GENERAL

1.01 Sections 01010 through 221426 of this Proposal Form include the Technical Specifications for all work related to the demolition of the existing concrete deck, roofing, flashing and other appurtenances down to the existing structural purlins. Additionally this work will include the construction of a new composite roof deck and the installation of a new SBS modified membrane roofing system. This work will take place at the Point Breeze Garage at 2330 Broening Highway, Baltimore, MD. General Provisions, Terms and Conditions and Section 100 of the Standard Specifications shall also apply to the work specified in these Sections.

PART 2 – MEASUREMENT AND PAYMENT

2.01 Unless otherwise specified herein, all work described in Sections 01010 through 221426, including all labor, materials, equipment and incidentals, complete in place as accepted by the Maryland Transportation Authority Architect, will **not** be measured for payment, but costs thereof shall be included in the contract lump sum price bid for the demolition of the existing concrete deck, roofing, flashing and other appurtenances down to the existing structural purlins and the construction of a new composite roof deck with a new SBS modified membrane roofing system at the Point Breeze Garage, 2330 Broening Highway, Baltimore, MD.



MISCELLANEOUS CONTINGENCIES (ALLOWANCE)

PART 1 – GENERAL

A contingent allowance of Forty Thousand Dollars (**\$40,000**) has been included in the Proposal Form (Schedule of Prices) for miscellaneous work that may be determined necessary by the Authority during the construction period.

This work shall be performed only upon written direction of the Architect. Upon the directions from the Architect, the Contractor shall submit a written time and material cost for this task for the Architect's review and/or approval prior to commencing any work. The Contractor shall allow two (2) weeks turn around time for review and approval. In lieu of this method, the Architect may direct the Contractor to perform the work in accordance with the requirements of "Force Account Work" Section GP 9.02 of the Specifications.

Refer also to TC 3.03 "Contingent Items" in the Standard Specifications.

PART 2 – MEASUREMENT AND PAYMENT

All work performed under this Item "Miscellaneous Contingencies (Allowance)" will be paid for on the basis of approved price proposal and/or force account record submitted in accordance with Section GP 9.02 of the Standard Specifications and with the authorization of the Maryland Transportation Architect. The approved amount shall be full compensation for all labor, equipment, materials and incidentals complete in place as directed by the Architect.

At the completion of the entire project, the contract award amount shall be adjusted by deducting the remaining amount of the contingencies allowance. (Schedule of Prices Item No. 403)

SECTION 01010 GENERAL

PART 1 – GENERAL

1.01 Work Scope and General Description

- A. All labor, equipment, materials, and supervision of work are to be provided by the Contractor to perform all work included in this specification for the Roof Replacement at the Garage Building at the Point Breeze Facility as seen during the pre-bid meeting and indicated on the contract drawings. Listed below is a general scope of work to be performed under this contract. A more detailed description of the work required of the Contractor for this project is included in this specification, on the project drawings and the other contract documents. The work will include but not be limited to:
1. Providing all labor, equipment, and materials to remove existing concrete deck and install a new composite cementitious roof deck and modified membrane roofing system.
 2. Removing all existing roof coverings, including all membrane, membrane flashings, aggregate and insulation as well as the entire concrete deck down to the existing structural purlins.
 3. Removing all existing metal flashings, including counter flashings, vent stacks, flashings, gutters, drip edge flashings scuppers, water table etc.;
 4. Completely replacing all wood nailers as necessary and indicated by the roof system manufacture, cants and metal around the entire perimeter of the buildings including the metal edge, metal coping cap and water table as indicated on the existing construction notes.
 5. Install the two (2) ply's of Type II Base sheet and SBS / SIS / ES recycled white modified cap sheet fully adhered with the cold adhesive and two (2) ply modified flashing system as per the written specification and details. (See specifications and drawings)
 6. The entire metal edge will be encapsulated with new wood nailers ice & water shield and a new metal edge system installed around the entire perimeter as per the specifications and details. This system will have no exposed fasteners thru the outside and /or inside of the metal system. All new reglet -mounted counter flashing will be installed around the perimeter brick wall as per the details provided and standard SMACNA detail. This detail is consistent with all lower roof sections.
 7. Install new SBS / SIS / ES recycled white starburst mineral modified cap sheet fully adhered with cold adhesive. The cap sheet must meet all the technical performance criteria in the written specifications Section 07550. Meeting all the Technical performance criteria that follows in the written specifications: Initial reflectance of

mineral sheet, aged reflectance of mineral sheet, bulk mineral reflectance specification gravity, tensile strength, tear strength, low temp. flex..(See Section 07550)

8. Energy Star Kynar White Coating System: Placing two full coats, separate coats of new white (protective and energy star approved) coating throughout the entire field and all exposed flashings throughout the entire building. Coating shall meet the Reflectivity and Solar Reflectance Index and all the other required performance criteria met in the technical portion of the written specification.
 16. All existing internal drains will be replaced with new drain bowl, drain ring and all new hardware, using new cast iron standard roof assembly.
 17. All exhaust fans, ventilators and any other penetration will be raised in accordance to NRCA and roof system manufacture standards in accordance to the flashing height minimum requirements. All necessary units that will be eliminated will be marked by MdTA and the roof system manufacture prior to the pre-bid meeting. All of these units and /or capped curbs will be removed and the appropriate deck and roof system installed.
- B. The roofing/flashing membrane Manufacturer's most recent specifications are wholly included as a part of this specification. The Manufacturer's specifications must be complied with, except as exceeded by this specification. In no event may any work be installed contrary to the Manufacturer's requirements.

1.02 Quality Assurance

- A. The new roof covering systems are to be installed by a qualified contracting firm that has a minimum of five years' successful experience in the installation of the roof covering system specified for this project. The Contractor must provide written certification from the roof membrane Manufacturer, certifying that the Contractor is approved and licensed by the Manufacturer to install the roof membrane system specified herein.
- B. The Contractor, roof system manufacturer (and all Subcontractors) are to meet with the MdTA Engineer (or MdTA representative) at the job site a minimum of one week before any commencement of work or delivery of materials, to discuss job coordination, such as staging areas, storage areas for materials, daily procedure of construction personnel, job site safety and security, and other project logistics. The Contractor's (and all Subcontractors') superintendent and project foreman are (both) required to attend this meeting as well. Failure of the Contractor's superintendent and foreman to (both) attend the pre-construction meeting will result in MdTA/the Engineer rescheduling the pre-construction meeting, and the Contractor will be back-charged for all time/expenses incurred by MdTA/the Engineer personnel for attending the meeting that the Contractor's superintendent and/or foreman fail to attend.
- C. The Contractor is to repair and/or replace all work installed by the Contractor that is, in the opinion of the Engineer and roof system manufacture, deficient, including any conditions that may diminish the life expectancy or performance of the roof covering system, including all flashings. Such repair and/or replacement work must be performed immediately upon the request of the Engineer, and at no additional cost to MdTA.

- D. The MdTA Engineer hereby reserve the right to have test cut samples of the new roof covering made for examination. All test cuts are to be made by the Contractor, where and when as directed by the Engineer. All sampled areas are to be repaired by the Contractor in such a way as to preserve all warranties and/or guarantees required in this specification, and at no additional cost to MdTA.
- E. The Contractor must perform all work in accordance with the best industry practices. All new roof covering systems are to meet the requirements for:
 - 1. Underwriter's Laboratories, Inc. and / or Wernock Hersey Class A Fire Hazard Classification. All major components of the roof covering system, including membrane, mechanical fasteners, adhesives, and surfacing/coating materials must be approved by Factory Mutual in the "Factory Mutual Approval Guide and / or listing."
 - 2. Factory Mutual Engineering corporation (FM) Class I Construction, as published in the most recent edition of the "Factory Mutual Approval Guide" and the "Factory Mutual Loss Prevention Data Bulletin 1-28" and / or approved by an accepted third party consulting firm meeting or exceeding all of the minimum standards set forth by Factory Mutual minimum testing criteria for the specified materials.
- F. The Engineer is to be informed of all subcontracting companies involved on this project (name, address, telephone number, etc.), prior to commencement of work. MdTA reserves the right to reject any Subcontractor

1.03 Submittals

- A. The Contractor is to submit a list of all products to be utilized on this project, three copies of the manufacturers' product specifications with performance and test data for each product, and material samples of any products that are specifically requested by the Engineer. The Contractor is to also submit certification from each product manufacturer that their product complies with the requirements of this specification and are compatible with the intended end use. **NOTE:** The Contractor's utilization of any roof covering system Manufacturer and/or material is subject to approval by the Engineer and MdTA. The Contractor must submit their proposed Manufacturer for the new roof covering system to MdTA (via the Engineer), prior to ordering/delivering any materials to the job site, or commencement of any work at the site. The Contractor must also submit a complete sample copy of the proposed Manufacturer's guarantee to MdTA (via the Engineer) for approval, prior to MdTA Engineer's approval of the proposed roof covering system Manufacturer.
- B. The Contractor is to submit a copy of all required permits for any portion of this project, including (but not limited to) building permits, crane permits, public access permits, road closure permits, torch/open flame permits, welding permits, Fire Marshal's permits, plumbing permits (for roof drain/plumbing work), mechanical permits, material disposal permits, bitumen hauling permits, asbestos abatement/disposal permits, asbestos-containing material transport/dump manifests, etc. The required permits will be predetermined by MdTA, the Contractor, and Engineer, and must be submitted to the Engineer for approval, prior to commencement of work. The Contractor must also have full copies of all applicable permits at the job site, on the roof, at all times while Contractor personnel are present at the project site.
- C. The Contractor is to submit full copies of all Material Safety Data Sheets (MSDS), for all roofing materials, bitumen, other bituminous materials, solvents, thinners, primers, sealants, and other chemical products utilized on this project. MSDS must also be submitted for any materials that may release fumes, odors, or vapors when exposed to the atmosphere and/or

heated. The Contractor must also have full copies of all applicable MSDS at the job site, on the roof, at all times while Contractor personnel are present at the project site.

- D. The Contractor must submit fully-executed copies of payment and performance bonds (if required in the Contract Documents), to MdTA (via the Engineer), in a written form acceptable to MdTA. AIA Document A-312 (1983 or later version) Payment and Performance Bonds are acceptable forms. The bonds must be fully executed, and submitted to the Engineer prior to the Contractor's delivery of materials to the job site or commencement of work at the site.
- E. The Contractor is to submit a copy of their current license certification and/or applicator's agreement with the roof covering system Manufacturer.
- F. The Contractor is to submit shop drawings of any construction detail (including work on known conditions and work on field conditions that may be uncovered or revealed during the project), if requested by the MdTA Engineer.
- G. The Contractor and all Subcontractors must submit a bona fide Certificate of Liability Insurance coverage to MdTA, via the Engineer. The Insurance Certificate must guarantee insurance coverage for the minimum dollar amounts as indicated in the State Highway Administration bid/contract documents.
 - 1. The Contractor's (and all Subcontractors') Insurance Certificates must specifically name the Maryland Transportation Authority, as additional insured.
 - 2. MdTA must receive written notice (via the Engineer) of any modification or cancellation of the Contractor's (or Subcontractor's) insurance policy(ies), at least 30 days prior to the effective date of any such modification or cancellation.
 - 3. The Contractor must endeavor to obtain additional insurance for this project if requested in writing from MdTA, prior to commencement of work.
- H. The Contractor is to submit a proposed project schedule showing approximate dates of start and completion times for each segment of the Contractor's (and all Subcontractors') operations on the project. The Contractor must also submit any other items requested by the Engineer to help clarify or document certain conditions, if requested. The Contractor may be required to submit a revised project schedule, at the discretion of the MdTA Engineer, if the Contractor's work operations vary from the submitted schedule.
- I. The Contractor is to provide all submittals to the Engineer prior to delivery of any materials to the job site and prior to commencement of any work at the job site (particularly submittals for coatings, caulks, sealants, and sheet metal). The Contractor is responsible for obtaining the Engineer's approval of all submittals prior to delivery of materials for commencement of work at the job site. Materials or procedures that are not approved are not to be used. Copies of all required insurance certificates, payment and performance bonds, permits, and MSDS must be submitted to the Engineer, no later than 5 calendar days after the Contractor's receipt of Notice to Proceed from MdTA.
- J. All submittals, correspondence, and requisitions for payment must be properly sent in the name of the Owner, and must clearly list the project name and Contract Number. The Contractor is to send all submittals, correspondence, and requisitions for payment directly to the Engineer:

Maryland Transportation Authority
Engineering Division - Design
John Jewell
300 Authority Drive
Baltimore, MD 21222

- K. Prior to submitting the final payment requisition, the Contractor must submit the applicable release of liens in a written form acceptable to MdTA.

1.04 Guarantees/Warranties

- A. Prior to submitting the final payment requisition, the Contractor must submit the roof membrane Manufacturer's 25-year guarantee of workmanship, labor, and materials, for the new roof covering system placed on this project. The guarantee must cover all defects and deficiencies in workmanship and materials, for all components of the built-up roofing membrane including flashings, field membrane, energy star coating down to the substrate and all metal components. The guarantee must specifically stipulate full coverage for the 25-year period, and no prorated warranty will be accepted. The guarantee must also stipulate and include full coverage of all costs associated with locating and repairing roof leaks. The Contractor must submit a sample copy of the (proposed) Manufacturer's guarantee to the Engineer and MdTA for approval, prior to MdTA final approval of the new roof covering system Manufacturer. The roof system manufacture must provide the owner an annual inspection throughout the life of the warranty period at "no additional cost" to MdTA. This report will be complete with photographs and maintenance recommendations throughout the life of the warranty. These additional services provided by the roof system manufacture shall be at "no additional cost" to MdTA.
- B. Prior to submitting the final payment requisition, the Contractor must submit the Contractor's 5-year guarantee of workmanship, materials, and performance, including all roof insulation/installation work, membrane work, sheet metal work, flashing work, duct insulation/membrane covering work, caulk and sealant installation, and all other work that is covered and/or not covered in the roof membrane Manufacturer's guarantee, in a written form acceptable to MdTA.
- C. Prior to submitting the final payment requisition, the Contractor is to confirm in writing to MdTA the approval status of the Manufacturer's guarantee issuance, and a copy of the Manufacturer's punch list items for completion.

1.05 Job Conditions

- A. The Contractor's and all Subcontractor's job site personnel must contact the Engineer each business day, no later than 7:30 A. M., to inform him/her of daily work progress, and to keep informed of activities and communicate pertinent information, even if no work is performed that day.
- B. Work is to proceed on all normal working days (Monday - Friday, excluding legal holidays, etc.), weather permitting, continuously from the commencement of the project through 100% completion. Weekend and holiday work may be allowed if requested by the Contractor, in writing, 48 hours in advance; and approved by the MdTA Engineer.
- C. The Contractor is to provide a signed, written report of daily progress, personnel on-site, and deliveries received, if requested by the MdTA Engineer.

- D. The Contractor must be present at the job site during all project activities, including Subcontractor work and all other outside personnel such as material deliveries, equipment operators, manufacturer's representatives, etc. The Contractor must contact the Engineer on all normal working days (when inclement weather prohibits roofing work) in order to ensure that the building is watertight.
- E. The Contractor and all Subcontractors must furnish all professionally-qualified (English speaking) supervision to oversee all of their job site operations.
- F. The Contractor must provide written work tickets at the job site, on a daily basis, for any "extra" work, including all "time-and-materials" work, and all work performed on a "unit price" basis (INCLUDING ALL ALLOTMENTS OF "UNIT PRICE" WORK THAT ARE INCLUDED IN THE CONTRACT PRICE). The work tickets must be presented to the Engineer and/or Representative, for signature upon acknowledgment of the work. Each work ticket must present complete information, including date, project, building address, Contract Number, Roof Area, type of work performed, quantities of materials used, and man/hours of labor, by work category. Copies of these work tickets must be submitted along with the Contractor's invoice for any "extra" work. Failure by the Contractor to provide daily work tickets may result in the Contractor not receiving payment for "extra" work.
- G. The Contractor must provide a portable toilet, and roof hoist and/or crane for all project operations.
- H. The Contractor must provide adequate dumpsters (or trash removal trucks) for the duration of the project, for removal of all debris, as directed by the Engineer..
- I. All work is to be performed in compliance with all applicable building codes. It is the responsibility of the Contractor (and all Subcontractors) to obtain all necessary permits, inspections, etc. as required by Federal, state, and local law for their part of the project work.
- J. The Contractor must fully cooperate with MdTA regarding location of vehicles, staging areas, equipment, stored materials, bitumen handling, etc., on-site at all times, and the Contractor must take all necessary measures to avoid impeding the normal flow of traffic, access, egress, and work around the buildings on-site. The Contractor may be required to secure the roof in a safe/watertight condition, remove all vehicles and equipment from the premises, and/or vacate the premises, immediately upon notification from MdTA, during (or in preparation for) any weather-related (or other) emergency in the area (such as snow removal, snow/ice road treatment, major storm clean-up, or any other emergency situation), and the Contractor may not be allowed onto the premises until such emergency work by MdTA is completed. MdTA will not be responsible for any mobilization costs, labor costs, equipment stand-by time, travel time/expenses, lodging expenses, meals, etc., caused by an emergency situation as described in this paragraph.

1.06 Material Delivery, Handling, and Storage

- A. All products and materials used must be newly manufactured, and of the best quality.
- B. Deliver all materials to the job site undamaged, in the manufacturers' original packaging. All materials must be clearly marked with the manufacturer's information, including the manufacturer's name, product name, ASTM codes where applicable, UL/FM labels, and date of manufacture.

- C. Upon arrival, all materials are to be inspected for physical damage, freezing, or overheating. Questionable materials will not be allowed for use.
- D. All materials must be stored in dry areas, completely above the ground or roof surface (a minimum of 4"), on wood pallets or other acceptable means. Comply with all manufacturer's instructions regarding storage temperatures and exposure to sunlight. Protect all materials (including wood) from moisture contamination, including condensation (particularly membrane and felts), by completely covering materials to the base of the pallet with tarpaulins made of polyethylene, polypropylene, canvas, etc., drawn tightly and securely fastened. Factory wrappers alone are neither suitable nor acceptable protection for materials. Store all roll goods on end. Stack lumber and plywood in a way so as to prevent warping and twisting, and keep all wood properly covered. Protect all materials and equipment on the roof from wind damage/blow-off.
- E. Remove all damaged or moisture-contaminated products from the job site immediately.
- F. Do not load or store materials on the roof in amounts that can cause stress or damage to the existing roof covering or structure.
- G. Do not deliver or store materials on the ground in amounts that can cause damage to the existing pavement or underground structures, storm sewers, piping, etc.

1.07 Work Conditions

- A. The Contractor must investigate all stages of work to be performed, for all project areas. The Contractor is responsible for investigating and inspecting the project, and for determining all quantities, measurements, dimensions, roof areas, and all other job site conditions. The Contractor is to immediately inform the Engineer, in writing, of any unacceptable conditions, and is not to proceed with work until such conditions are made acceptable to MTA, Contractor, and Engineer.
- B. Roofing work may proceed only in dry weather, when conditions comply with the manufacturer's recommendations and limitations. Roofing work may not proceed when the outside temperature is less than 40 degrees Fahrenheit, and materials may not be installed onto damp or frozen surfaces.
- C. The Contractor must not expose the roof deck or newly-installed materials to possible water or wind damage in greater amounts than can be properly completed and watertight in the same day.
- D. Phased construction will not be allowed on this project. Work must proceed fully and continuously from commencement through completion, except on weekends, designated holidays, and during inclement weather.

1.08 Safety and Protection

- A. The Contractor must be entirely and totally responsible for all safety on the job site and project premises, and must comply with all applicable OSHA and MOSHA requirements, and good safety practices.
- B. The Contractor and all Subcontractors must provide all necessary safety equipment including (but not limited to) barricades, flags, signs, traffic cones, safety rails, fire hoses, fire

extinguishers, and all other equipment needed to conduct safe operations on the roof, ground, and premises.

- C. The Contractor is to keep all areas of the project in a clean, neat, and orderly condition at all times. Trash and debris must be cleaned up and removed on a daily basis, particularly from all areas or levels lower than the roof (sidewalks, grounds, etc.).
- D. The Contractor is to install, maintain, and be responsible for the safe use of all scaffolding, platforms, ladders, etc. The Contractor is to provide all necessary scaffolding, work platforms, ladders, safety lines/harnesses, etc. for safe access to all work areas by all of the Contractor's (and Subcontractors') personnel on the project. The Contractor is to make certain that all ladders are properly secured (tied-off) at all times during roof construction.
- E. Protect all exterior and interior building surfaces against damage from the work operation and potential leakage. Foot traffic by the Contractor's personnel are not allowed inside the building, except during an emergency, and all roof access for Contractor personnel will be via the Contractor's ladder. All ladders must be removed from the building at the end of each day's work, and either secured at the job site or removed from the job site. The Contractor must install and maintain floor protection at all times, over all interior roof access pathways, if any interior access is required. Protect pavement, sidewalks, stairways, walls, floors, carpets, doors, windows, etc. from damage. If any work is required inside the building, Contractor personnel must wear clean shoes at all times while inside the building.
- F. Water cut-offs are to be installed at the end of each day's work and whenever precipitation is imminent, as necessary to protect all exposed edges of the system from moisture intrusion. Water cut-offs must be maintained in a watertight condition throughout all times of precipitation and surface moisture.
- G. The Contractor must respond immediately to all reports of leakage at the project and make emergency repairs as necessary to stop such leakage. Emergency telephone numbers for Contractor, Engineer, and MdTA personnel will be distributed immediately following the pre-construction meeting.
- H. Prevent bitumen drippage and debris from entering joints, openings, scuppers, downspouts, roof drains, and over roof edges.
- I. Protect all newly-placed roof and flashing membrane as necessary from foot and equipment traffic, dirt, debris, materials, etc. with a full layer of protection course, such as asphaltic board, plywood, or other material approved by the Engineer. Under no circumstances may materials or work be staged on newly-placed roofing. The work is to be logistically coordinated so that work and foot traffic over new roofing is avoided. This requirement will be strictly enforced. Materials, tools, and particularly gravel and debris must be kept off of the new roof membrane on a daily basis.

END OF SECTION

SECTION 01330 SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. General Provisions, Terms and Conditions, Special Provisions, Technical Specification Divisions 2 through 16, other Division 1 Specifications Sections and Drawings apply to this Section.
- B. Refer to Terms and Conditions TC 4.01 – Shop Plans and Working Drawings for additional requirements.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
 - 1. Submittal Register Shall be Submitted Prior to the Notice to Proceed, the Contractor shall submit a complete submittal register to the Engineer for review and approval. This submittal register shall be developed in Microsoft Excel and an electronic copy shall be submitted to the MdTA Project Manager. The submittal register shall include related specification section and article number, submittal number, product description, anticipated date to be submitted, and actual date submitted. The Contractor shall be responsible to update the submittal register continuously and submit a copy to the MdTA Project Manager monthly. The updated submittal register will be reviewed and discussed at the Monthly Schedule Update Meeting.
 - 2. Pre-Submittal Meeting within 21 days after receipt of Notice to Proceed, the Contractor shall arrange a pre-submittal meeting with the MdTA Project Manager. The meeting will discuss the content of the submittal register as well as the requirements for acceptable submittals. The meeting shall be attended by the Contractors Project Manager, Project Engineer and Architect, Site Superintendent, Project Scheduler, and Critical Subcontractor Project Managers. Meeting minutes will be developed by the MdTA Project Manager.

1.03 DEFINITIONS

Informational Submittals: Written information that does not require Engineer or MDTA Project Manager's approval. Submittals may be rejected for not complying with requirements of applicable sections.

1.04 SUBMITTAL PROCEDURES

- A. General: Contractor may assume that one electronic copy of CAD Drawings of the Contract Drawings will be provided by the MdTA for Contractor's use in preparing submittals.
- B. Product Warranty Submittals: Product Warranties shall be submitted with the technical submittals. Failure to submit the product warranty with the technical submittal shall be cause for the entire technical submittal to be rejected.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- D. Submittals Schedule: Comply with requirements Activities Chart Project Schedule for a submittals and time requirements for scheduled performance of related construction activities.
- E. Processing Time: Refer to Standard Provisions for processing time.
 - 1. Number of Samples for Initial Selection: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
- F. Identifications: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 4 by 5 inches on label or beside title block to record contractor's review and approval markings and action taken by the Engineer.

3. Include the following information on label for processing and recording action taken:
 - a. Project Name
 - b. Date
 - c. Name and address of Engineer
 - d. Name and address of Contractor
 - e. Name and address of Subcontractor
 - f. Name and address of Supplier
 - g. Name of Manufacturer
 - h. Unique identifier, including revision number
 - i. Number and title of appropriate Specification Section
 - j. Drawing number and detail references, as appropriate
 - k. Other necessary identification.

- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. The MdTA Project Manager will return submittals without review received from sources other than Contractor.
 1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
 2. Transmittal Form: Provide locations on contractor's typical transmittal form for the following information:
 - a. Project Name
 - b. Date
 - c. Destination (To)
 - d. Source (From)
 - e. Names of subcontractor, manufacturer, and supplier

- f. Category and type of submittal
 - g. Submittal purpose and description
 - h. Submittal and transmittal distribution record
 - i. Remarks
- H. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

PART 2 – PRODUCTS

ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- 1. Number of copies: Submit to MdTA Project Manager seven copies of each submittal, unless otherwise indicated. The MdTA Project Manager will return four copies. Mark up and retain one returned copy as a Project Record Document.
- B. Product Data. Collect information into a single submittal for each element of construction and type of product or equipment.
- 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable;
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.

- g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operating and maintenance manuals.
 - k. Compliance with recognized trade association standards.
 - l. Compliance with recognized testing agency standards.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
- 1. Preparation: Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations
 - j. Compliance with specified standards
 - k. Notation of coordination requirements
 - l. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
 4. Number of Copies: Submit copies of each submittal, as follows: Submit to MdTA Project Manager seven copies of each submittal, unless otherwise indicated. The MdTA Project Manager will return four copies. Mark up and retain one returned copy a Project Record Document.
- D. Coordination Drawings: Refer to Technical Provisions – General Information for requirements associated with Coordination Drawings”
- E. Samples: Prepare physical units of materials or products, including the following:
1. Comply with requirements in Division 1 Section 1400 “Quality Requirements” for mockups.
 2. Samples for Initial Selection: Submit manufacturer’s color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials, complete units of repetitively used materials; swatches showing color, texture, and pattern’ color range sets; and components used for independent testing and inspection.
 4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Engineer’s same where so indicated. Attach label on unexposed side that includes the following:
 - a. Generic description of Sample
 - b. Product name or name of manufacturer.
 - c. Sample source

PART 3 - EXECUTION

CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to the Engineer.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Document.

DIVISION 02 – EXISTING CONDITIONS

SECTION 02 83 19 LEAD HAZARD CONTROL ACTIVITIES

PART 1 - GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basis designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z9.2 (1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 1553 (1993) Practice for Collection of Airborne Particulate Lead During Abatement and Construction Activities

ASTM E 1613 (1999) Standard Test Method for Determination of Lead by Inductivity Coupled Plasma Atomic Emission Spectrometry (ICP AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption (GFAAS) Techniques

ASTM E 1644 (1998) Practice for Hot Plate Digestion of Dust Wipe Samples for the Determination of Lead

ASTM E 1726 (1995) Sample Digestion of Soils for the Determination of Lead by Atomic Spectrometry

ASTM E 1727 (1999) Field Collection of Soil Samples for Lead Determination by Atomic Spectrometry Techniques

ASTM E 1728 (1999) Field Collection of Settled Dust Samples Using Wipe Sampling Methods for Lead Determination by Atomic Spectrometry Techniques

ASTM E 1729 (1999) Field Collection of Dried Paint Samples for Lead Determination by Atomic Spectrometry Techniques

- ASTME E 1741 (2000) Preparation of Airborne Particulate Lead Samples Collected During Abatement and Construction Activities for Subsequent Analysis by Atomic Spectrometry
- ASTM E 1792 (1996a) Wipe Sampling Materials for Lead in Surface Dust
- ASTM E 1795 (2000) Non-Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings
- ASTM E 1796 (1997) Selection and Use of Liquid Coating Encapsulation Products for Leaded Paint in Buildings
- ASTM E 1797 (2000) Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings

CODE OF MARYLAND REGULATIONS

- COMAR 26.02.07 Procedures for Abating Lead Containing Substances from Buildings
- COMAR 26.16.01 to .03 Accreditation and Training for Lead Paint Abatement Services, Reduction of Lead Risk in Housing, and Procedures for Making and Implementing a Qualified Offer

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 701 (1999) Methods of Fire Tests for Flame-Resistant Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

- NIOSH Pub No. 84-100 (1984); Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

- HUD 6780 (1995; Errata Aug 1996; Rev Ch. 7 – 1997) Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

- EPA 747-K-99-001 (1999) Protect your Family From Lead in Your Home

U.S. CODE OF FEDERAL REGULATIONS (CFR)

24 CFR 35	Lead-Based Paint Poisoning Prevention in Certain Residential Structures
29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 745	Lead-Based Paint Poisoning Prevention in Certain Residential Structures

UNDERWRITERS LABORATORIES (UL)

UL 586	(1996; Rev thru Aug 1999) High Efficiency, Particulate, Air Filter Units
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1.2 DEFINITIONS

- A. Lead Hazard Control Activity – Any construction work where a worker may be occupationally exposed to lead and procedures have to be followed to assure that: 1). Lead inside the lead hazard control area is cleaned up to appropriate levels and 2). Lead dust does not disperse outside the lead hazard control area at unacceptable levels.
- B. Public/Commercial Building – Buildings on real property, including residential real property, generally accessible to the public except target housing, child occupied facilities and industrial buildings. Examples include offices, stores/shopping centers, churches, schools, barracks, hospitals, museums, airports, hotels, convention centers.
- C. Child-occupied Facility – Real property which is a building or portion of a building constructed prior to 1978 visited regularly by the same child, under 8 years of age, on at least two different days, provided that each day's visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Child-occupied facilities include but are not limited to, day-care centers, preschools and kindergarten classrooms.

1.3 DESCRIPTION OF WORK

Lead-based paint (LBP) and lead-containing paint (LCP) has been identified at various locations throughout the facility. See Appendix 3: Table 1 for LBP and LCP locations. The work covered by this section includes work tasks that impact and disturb LBP

and/or LCP and the precautions specified in this section for the protection of workers, building occupants and the environment. Dust or debris generated from LCP surfaces (such as structural steel and purlins associated with the existing roof system) through the course of roof replacement (such as by drilling through existing structural members with LCP or LBP surface coatings) shall be contained and properly disposed. Electricity is available on site, but the contractor is responsible for providing water.

A. Protection of Existing Areas To Remain

All project work including, but not limited to, lead hazard work, storage, transportation, and disposal shall be performed without damaging or contaminating adjacent work and areas. Where such work or areas are damaged or contaminated, the Contractor shall restore work and areas to the original condition at no additional cost to the MdTA.

B. Coordination with Other Work

The Contractor shall coordinate lead hazard control activities with work being performed in adjacent areas. Coordination procedures shall be explained in the Contractor's Accident Prevention Plan and shall describe how the Contractor will prevent lead exposure to other contractor personnel performing work unrelated to lead hazard control activities.

Note: All work related to conducting abatement of the materials identified above must be performed between the hours of 0700 and 1700.

1.4 SUBMITTALS

MdTA approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only.

SD-03 Product Data

Materials and Equipment;
Expendable Supplies;

A description of the materials, equipment and expendable supplies required; including Material Safety Data Sheets (MSDSs) for material brought onsite to perform the work. Qualifications; G A report providing evidence of qualifications and designating responsibilities for personnel and laboratories.

SD-06 Test Reports

Pressure Differential Log;
Licenses, Permits, and Notifications; G

Accident Prevention Plan (APP); G

A report describing how the Contractor will protect workers, building occupants, and building contents while performing lead hazard control activities; and how project clearance will be performed.

Sampling and Analysis; G

A log of the analytical results required for the sampling. The log shall be kept current.

Clearance Report; G

1.5 QUALIFICATIONS

A. Qualifications and Organization Report

The Contractor shall furnish a qualification and organization report. The report shall describe the qualifications of the qualified safety and health professional (QSHP), onsite safety and health supervisor (OSHS), and labor staff. The report shall include the Contractor's personnel by name and title and project specified responsibilities and authorities. The report shall describe the qualifications of the laboratories selected for this project. The report shall be signed by the Contractor and the qualified safety and health professional to indicate that all personnel and laboratories comply with certification and experience requirements of this section and that project personnel have been given the authority to complete the tasks assigned to them.

B. Personnel and Subcontractor's Responsibilities and Qualifications

1. Qualified Safety and Health Professional (QSHP)

The QSHP shall be responsible for development of project specific requirements in the Accident Prevention Plan (APP); supervise implementation of the APP requirements; visit the site as needed to verify effectiveness of the APP and to coordinate resolution of unknown situations that may develop as the work progresses; be available to provide consultation to the Onsite Safety and Health Supervisor (OSHS); review sampling and analytical results to evaluate occupational exposure levels, verify effectiveness of controls and determine if clearance requirements have been met. The QSHP shall have demonstrable experience with the implementation of occupational safety and health regulations.

2. Lead Hazard Control Workers

Lead Hazard Control workers shall be responsible for performing the labor necessary to complete the lead hazard control activities required in this contract.

3. Testing Laboratories

The laboratory selected to perform analysis on paint chip, soil or dust wipe samples shall be accredited by EPA's National Environmental Lead Laboratory Accreditation Program (ELLAP). The laboratory selected perform analysis on worker exposure (industrial hygiene) samples shall be in the American Industrial Hygiene Association's Industrial Hygiene Laboratory Accreditation Program (IHLAP) and shall be successfully participating in the Proficiency Analytical Testing (PAT) program for lead.

4. Blood Lead Testing

The laboratory selected to perform analysis on worker blood samples shall be approved by OSHA and meet the requirements contained in [HTTP://WWW.OSHA-SLC.GOV/ocis/TOC_BLOODLEAD.HTML](http://www.osha-slc.gov/ocis/TOC_BLOODLEAD.HTML).

5. Disposal Facility and Transporter

The Contractor shall furnish written evidence that the landfill to be used is approved for lead disposal by State of Maryland requirements. Copies of any required signed agreements between the Contractor (including subcontractors and transporters) and the lead disposal facility shall be provided.

1.6 REGULATORY REQUIREMENTS

In addition to the detailed requirements of this specification, work shall be performed in accordance with applicable regulations including, but not limited to 29 CFR 1910, 29 CFR 1926, especially Section .62, and the accepted Accident Prevention Plan. Matters of interpretation of the standards shall be resolved to the satisfaction of and with the concurrence of, the MdTA and/or MdTA's representative before starting work. Where these requirements vary, the most stringent shall apply. The following local statutes, regulations and requirements apply to lead hazard control activities to be performed: COMAR 26.02.07 and 26.16.01 to .03.

1.7 ACCIDENT PREVENTION PLAN (APP)

A. APP Content and Organization

The Contractor's Accident Prevention Plan shall consist of: a. Signature Sheet, Background Information, c. Responsibilities and Lines of Authorities, d. Subcontractors and Suppliers, e. Training, f. Safety and Health Inspections, g. Accident Reporting, h. Medical Support, i. Corporate Plans and Programs required by this contract, (HAZCOM, Respiratory Protection). The APP shall also include the following Plans or sections:

1. Lead Hazard Control Plan

The Lead Hazard Control Plan shall address occupational exposure issues and shall describe the procedures to be followed to protect employees from lead hazards while performing lead hazard control activities. Each of the following elements shall be addressed in the lead hazard control appendix:

- a. The location and a brief description of each work activity that will emit lead into the workplace atmosphere. A description of any components containing lead shall be included and keyed to the project drawings.
- b. Description of equipment and materials, controls, crew size, worker responsibilities, and operating and maintenance procedures.
- c. Description and sketch of the Lead Hazard Control Areas, including decontamination areas.
- d. Description of the specific lead control methods and procedures to protect workers and other onsite contractors from lead exposure.
- e. Technologic equipment used to keep occupational exposure below the Permissible Exposure Limit and minimize worker exposure to lead (i.e., HEPA-filtered vacuum equipment/cleaners, special negative air enclosure equipment and supplies, etc.).
- f. Worker Exposure Assessment including methods and procedures to monitor and document worker exposure to lead. Worker exposure monitoring shall be broken into two parts in the plan. Part A: Initial Determination. The Contractor shall describe worker monitoring (if performed for the "initial determination" described in 29 CFR 1926 (.62) (d). Monitoring for the initial determination may be omitted from the plan if the Contractor has sufficient proof from previous operations as specified in 29 CFR 1926 (.62) (d) (3) (iii) and (iv) that workers will not be exposed over the action level. The Contractor shall substitute objective proof of action level compliance in Part A if "initial determination" monitoring is omitted. Part B: Continued Exposure Monitoring. Worker exposure monitoring after the initial lead exposure determination has been made.
- g. Work Practices Program describing the protective clothing to be used to protect workers from lead exposure, house keeping procedures employed to minimize spread on lead contamination in the lead hazard control area, hygiene facilities and practices used to prevent workers from inadvertent ingestion of lead.
- h. Administrative Control Procedures, to be used as a last resort, to limit worker exposure to lead. The worker rotation schedule to be employed, should engineering or personal protective equipment

precautions fail to be effective, shall be described. This element of the plan shall be omitted if administrative controls will not be used.

- i. Medical Surveillance practices and procedures used to monitor worker exposure to lead and to assure fitness for wearing respiratory protection devices.
- j. Worker training meeting the requirements of 29 CFR 1926 Sections (.62) and (.59) to assure workers understand hazard associated with working with lead and how to protect themselves.
- k. Security: A log shall be kept documenting entry into and out of the lead hazard control area. Entry into lead hazard control areas shall only be by personnel authorized by the Contractor and the MdTA and/or MdTA's representative. Persons entering control areas shall be trained, medically evaluated, and equipped with personal protective equipment required for the specific control area to be entered.

2. Occupant/Building Protection Plan

The Contractor shall develop and implement an Occupant/Building Protection Plan describing the measures and management procedures to be taken during lead hazard control activities to protect the building occupants/building facilities (and future building occupants/facilities) from exposure to any lead contamination while lead hazard control activities are performed.

3. Clearance Plan

The Contractor shall develop a Clearance Plan describing practices and procedures used to assure that lead hazard control activities are complete and that lead contamination within the lead hazard control area comply with final clearance levels or visual clearance criteria. Sampling and analysis procedures used to document project completion and clearance goals shall be explained in the Clearance Plan.

1.8 PRE-CONSTRUCTION SAFETY CONFERENCE

A. Conference General Requirements

The Contractor and the QSHP shall attend a pre-construction safety conference prior to starting work. Items required to be submitted shall be reviewed for completeness, and where specified, for acceptance. Details of the APP shall be revised to correct any deficiencies and resubmitted for acceptance. Onsite work shall not begin until the APP has been accepted, unless otherwise authorized by the MdTA and/or MdTA's

representative. One copy of the APP shall be maintained in the Contractor's jobsite file, and a second copy shall be posted where it will be accessible to personnel on the site. As work proceeds, the APP shall be adapted to new situations and conditions. Changes to the APP shall be made by the QSHP with acceptance by the MdTA and/or MdTA's representative. Should an unforeseen hazard become evident during performance of the work, the QSHP shall inform the MdTA and/or MdTA's representative, both verbally and in writing, for immediate resolution. In the interim, the QSHP shall take necessary action to re-establish and maintain safe working conditions; and to safeguard onsite personnel, visitors, the public, and the environment. Disregard for provisions of this specification, or the accepted APP, shall be cause for stopping of work until the matter is rectified.

B. Preparatory Inspection Meeting

The Contractor shall arrange and hold a preparatory inspection meeting to review completeness and adequacy of the APP immediately prior to beginning each phase of work.

1.9 MEDICAL SURVEILLANCE REQUIREMENTS

The Contractor shall comply with the following medical surveillance requirements:

A. The Contractor shall make every attempt to keep occupational exposure to lead on this project below the action level of 30 micrograms/cubic meter defined in 29 CFR 1926 (.62). If it is not possible, and if occupational exposures could possibly exceed the action level for 30 or more days per year, the Contractor shall institute a medical surveillance program. The program shall meet the examination frequency and content requirements specified in paragraph (j) (1), (j) (2) and (j) (3) of 29 CFR 1926 (.62). Medical removal as specified in paragraph (k) of 29 CFR 1926 (.62), if necessary, shall be at the Contractor's expense.

B. Medical surveillance and biological monitoring shall be in compliance with 29 CFR 1926 (.62) (g) and (j). Initial biological monitoring shall be performed on lead hazard control workers prior to assignment to the project. Workers shall not be assigned to the project if results indicate a need for restricted activities.

C. All lead hazard control workers shall pass the medical examinations necessary to be approved by the occupational physician to wear respiratory protection on this project. Occupational physician's approval shall be given prior to assignment to the project.

1.10 RESPIRATORY PROTECTION PROGRAM

The Contractor shall have a written respiratory protection program and shall be fully capable of implementing the requirement of the respiratory protection program on this project. The respiratory protection program shall meet the requirements of 29 CFR 1926 (.62) and 29 CFR 1910 (.134). Project specific respiratory protection requirements shall be included in the

lead hazard control plan appendix of the Contractor's accident prevention plan.

1.11 LICENSES, PERMITS AND NOTIFICATIONS

The Contractor shall certify in writing to the MdTA and/or MdTA's representative at least 10 business days prior to the commencement of work that licenses, permits and notifications have been obtained. The Contractor is responsible for all associated fees or costs incurred in obtaining the licenses, permits, and notifications.

1.12 TRAINING

A. OSHA Training Requirements

All Contractor personnel and/or subcontractors performing or responsible for onsite oversight of lead hazard control activities shall meet the following training requirements.

1. Content of COMAR 26.02.07 and 29 CFR 1926 (.62) and its appendices.
2. How operations could result in exposure over the action level.
3. Purpose, selection, fitting, use and limitations of respirators.
4. Purpose and description of the medical surveillance program.
5. Use of engineering controls and good work practices to limit occupational exposure to lead.
6. Implementation of the lead hazard control plan appendix of the accident prevention plan.
7. Medical supervision for the use of chelating agents.
8. Employee right of access to medical surveillance records as specified in 29 CFR 1910 (.1020).

B. Qualified Safety and Health Professionals

The qualified safety and health professional shall meet the training requirements in paragraph A and shall meet the training, experience and authority requirements in 29 CFR 1926 (.62) to be a competent person.

C. Abatement Worker (if any)

Workers shall meet the OSHA Training Requirements specified above and the training requirements in 40 CFR 745 Subpart L to carry certification as a Certified Worker, when impacting surface coatings with concentrations of lead greater than the State of Maryland's definition of lead-based paint, >0.7 milligrams lead per square centimeter (mg/cm² or >0.5% lead by weight).

D. Training Program Certification

If required, training to meet 40 CFR 745 Subpart L requirements shall be provided by an EPA accredited training provider and the Contractor shall provide proof in the Qualifications and Organization Report showing that personnel have passed certification examinations for their respective disciplines, that fees for certification have been paid to the State of Maryland and that EPA has certified the QSHP, certified workers to perform their duties.

1.13 SAMPLING AND ANALYSIS

A. Sampling and Analytical Procedures

1. Sampling and Analysis Methods

Sampling and analysis shall conform to NIOSH Pub No. 84-100 Method 7082, Lead, for personal sampling required by 29 CFR 1926 (.62).

B. Occupational Exposure Assessment

Sampling and analytical procedures to determine compliance with the occupational exposure monitoring requirement of this section shall be described in the lead hazard control plan of the Contractor's accident prevention plan. Monitoring for the initial determination may be omitted if the Contractor has sufficient proof from previous operations as specified in 29 CFR 1926 (.62) (d) (3) (iii) and (iv) that workers will not be exposed over the action level. The following occupational exposure monitoring requirements apply and shall be implemented if the requirements of 29 CFR 1926 (.62) (d) (3) (iii) and (iv) cannot be demonstrated.

1. During Initial Monitoring the Contractor shall representatively sample employees with the greatest potential for exposure to aerosolized lead.
2. Continued/Additional Monitoring shall meet applicable paragraphs in 29 CFR 1926 (.62) (d) (6), Frequency, after the initial determination has been made.

C. Lead Hazard Control Area/Containment Monitoring

The Contractor shall perform a visual inspection once per day outside the lead hazard control area to assure visual clearance criteria are maintained while lead hazard control activities are performed. The Contractor shall clean at its own expense, and to the MdTA and/or MdTA's representative satisfaction, all contaminated surfaces outside the lead hazard control area, if surfaces fail visual clearance criteria.

D. Waste Disposal Sampling

The Contractor shall sample the waste streams for TCLP analysis to determine waste disposal classification.

1. The Contractor shall take samples of building demolition debris to appropriately classify the waste stream as RCRA hazardous or nonhazardous. The Contractor shall determine additional analysis required by the disposal outlet.

E. Analytical Results

The Contractor shall develop and maintain during the course of the project a log of analytical results generated by the above sampling requirements. The log shall clearly describe the reason for which the sample was taken (worker exposure, migration control) the analytical result for each sample and evaluate if the analytical result passed or failed the action levels. At a minimum, the Contractor shall include analytical results for samples required to be taken in paragraphs Occupational Exposure Assessment.

1.14 CLEARANCE REQUIREMENTS

The Contractor shall describe clearance requirements for this project in the Clearance Plan of the Accident Prevention Plan.

1.15 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The Contractor shall describe the PPE to be used to protect workers from lead hazards in the Lead Hazard Control Plan of the Accident Prevention Plan. The Contractor shall furnish, at no cost to the workers, clothing for protection from lead-contaminated dust and debris. An adequate supply of these items shall be available for worker and MdTA and/or MdTA's representative use. Protective clothing shall include:

- a. Coveralls: Full-body moisture permeable (breathable) disposable coveralls shall be provided to lead hazard control workers.
- b. Boots: Boot/shoe covers shall be provided to prevent contamination of boots and shoes and tracking of lead contaminated dust to other areas.
- c. Hand Protection: Gloves, etc., shall be provided as required to protect workers.
- d. Head Protection: Hard hats shall be provided as required by 29 CFR 1910 (.135) for workers and authorized visitors.
- e. Eye and Face Protection: Eye and face protection shall be provided as required by 29 CFR 1910 (.133) for workers and authorized visitors.
- f. Respirators: NIOSH certified air-purifying respirators or filtering face pieces shall be provided for use as respiratory protection for airborne lead and for other hazardous airborne contaminants that may be encountered; as determined by the on-site safety and health supervisor. At a minimum, respirators shall be furnished to each employee required to enter a lead hazard control area where an employee

- exposure assessment has not yet been performed, or where monitoring data establishes the need for respiratory protection, or if requested by the employee.
- g. Respirator Cartridges/Filtering Face Pieces: Respirator cartridges shall be changed out/filtering face pieces properly disposed of when they become sufficiently loaded with particulate matter that workers experience breathing resistance. Cartridges and filtering face pieces shall be 100 rated to assure sufficient protection from lead exposure.

1.16 HYGIENE FACILITIES

The Contractor shall describe the personal hygiene facilities to be used by the workers in the Lead Hazard Control Plan of the Accident Prevention Plan. The Contractor shall provide hygiene facilities for lead hazard control workers. Hygiene facilities shall consist of the following:

A. Hand Wash Stations

The Contractor shall provide hand washing facilities for use by lead hazard control workers. Hand washing facilities shall comply with the requirements in 29 CFR 1925 (.51) (f). Faces and hands shall be washed when leaving the lead hazard control area and after each work-shift if showers are not provided.

B. Change Area

The Contractor shall provide a change area to workers. The change area shall be equipped so that contaminated work clothing and street clothes shall be stored separately to prevent cross contamination.

C. Showers

Showers shall be provided if feasible and if worker exposures exceed the PEL. When provided, shower facilities shall meet the requirements of 29 CFR 1926 (.51) (f).

D. Eating Area

The Contractor shall set aside an area or provide a room for taking breaks and eating lunch. This area shall be kept as free as practicable from lead contamination. Workers shall be required to follow the procedures in 29 CFR 1926 (.62) (i) (4) when using the room.

1.17 POSTED WARNINGS AND NOTICES

In addition to the caution sign required to be posted at least three days before removing or

encapsulating lead paint per COMAR 26.02.07, the following regulations, warnings, and notices shall be posted at the worksite in accordance with 29 CFR 1926 (.62).

A. Regulations

At least two copies of 29 CFR 1926 (.62) shall be made available for use by either the MdTA and/or MdTA's representative or affected workers; and for the purpose of providing required information and training to the workers involved in the project. One copy shall be maintained in the Contractor's jobsite file, and a second copy shall be posted where it will be accessible to workers on the site.

B. Warning Signs and Labels

Warning signs shall be posted in each lead hazard control area where worker exposure to lead is undetermined or where the exposures are above the permissible exposure limit as defined in 29 CFR 1926 (.62). Signs shall be located to allow personnel to read the signs and take necessary precautions before entering the lead hazard control area.

1. Warning Signs

Warning signs shall be in English (and Spanish as needed), be of sufficient size to be clearly legible, and display the following:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

2. Warning Labels

Warning labels shall be affixed to all lead waste disposal containers used to hold materials, debris and other products contaminated with lead hazards; warning labels shall be in English (and Spanish as needed), and be of sufficient size to be clearly legible, and display the following:

CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS.

C. Worker Information

Right-to-know notices shall be placed in clearly visible areas accessible to personnel on the site, to comply with Federal, state, and local regulations.

D. Air Monitoring Results

Air monitoring results shall be prepared so as to be easily understood by the workers. One copy shall be maintained in the Contractor's jobsite file, and a second copy shall be posted where it will be accessible to the workers as specified in 29 CFR 1926 (.62).

E. Emergency Telephone Numbers

A list of emergency telephone numbers shall be posted at the site. The list shall include numbers of the local hospital, emergency squad, police and fire departments, MdTA, and Contractor representatives who can be reached 24 hours per day, and professional consultants directly involved in the project.

1.18 MATERIALS AND EQUIPMENT

Sufficient quantities of health and safety materials required by 29CFR 1926 (.62), and other materials and equipment needed to complete the project, shall be available and kept on the site.

A. Abrasive Removal and Powered Equipment

The use of a powered machine on LBP and/or LCP for sanding, grinding, drilling, or abrasive blasting is prohibited unless equipped with local exhaust ventilation systems equipped with high efficiency particulate air (HEPA) filters.

B. Vacuum Systems

Vacuum systems shall be suitably sized for the project, and filters shall be capable of trapping and retaining all mono-disperse particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent. Used filters that are being replaced shall be disposed in a proper manner.

C. Heat Blower Guns

Heat blower guns shall be flameless, electrical, paint-softener type with controls to limit temperature to 1,100 degrees F. Heat blower shall be DI (non-grounded) 120 volts ac, and shall be equipped with cone, fan, glass protector and spoon reflector nozzles.

D. Chemical Paint Strippers

Chemical paint strippers shall not contain methylene chloride and shall be formulated to prevent stain, discoloration, or raising of the substrate materials.

E. Chemical Paint Stripper Neutralizer

Neutralizers for paint strippers shall be compatible with the substrate and suitable for use with the chemical stripper that has been applied to the surface.

F. Detergents and Cleaners

Detergents or cleaning agents used shall have demonstrated effectiveness in lead control work using cleaning techniques specified by HUD 6780 guidelines.

1.19 EXPENDABLE SUPPLIES

A. Polyethylene Bags

Disposable bags shall be polyethylene plastic and shall be a minimum of 6 mils thick (4 mils thick if double bags are used) or any other thick plastic material shown to demonstrate at least equivalent performance; and shall be capable of being made leak-tight. Leak-tight means that solids, liquids or dust cannot escape or spill out.

B. Polyethylene Leak-tight Wrapping

Wrapping used to wrap lead contaminated debris shall be polyethylene plastic that is a minimum of 6 mils thick or any other thick plastic material shown to demonstrate at least equivalent performance.

C. Polyethylene Sheeting

Sheeting shall be polyethylene plastic with a minimum thickness of 6 mil, or any other thick plastic material shown to demonstrate at least equivalent performance; and shall be provided in the largest sheet size reasonably accommodated by the project to minimize the number of seams. Where the project location constitutes an out of the ordinary potential for fire, or where unusual fire hazards cannot be eliminated, flame-resistant polyethylene sheets which conform to the requirements of NFPA 701 shall be provided.

D. Tape and Adhesive Spray

Tape and adhesive shall be capable of sealing joints between polyethylene sheets and for attachment of polyethylene sheets to adjacent surfaces. After dry application, tape or adhesive shall retain adhesion when exposed to wet conditions, including amended water. Tape shall be minimum 2 inches wide, industrial strength.

E. Containers

When used, containers shall be leak-tight and shall be labeled in accordance with EPA, DOT and OSHA standards, as specified in paragraph WARNING LABELS.

F. Chemicals

Chemicals, including caustics and paint strippers, shall be properly labeled, used in accordance with the manufacturers recommendations and stored in leak-tight containers. Material Safety Data Sheets (MSDSs) shall be provided and hazard communication procedures implemented in conformance with paragraph HAZARD COMMUNICATION PROGRAM.

1.20 STORAGE OF MATERIALS

Materials shall be stored protected from damage and contamination. During periods of cold weather, plastic materials shall be protected from the cold. Flammable or hazardous materials shall not be stored inside a building. Materials shall be regularly inspected to identify damaged or deteriorating items. Damaged or deteriorated items shall not be used and shall be removed from the site as soon as they are discovered. Stored materials shall not present a hazard or an inconvenience to workers, visitors, and/or other occupants and employees of the facility in which they are located.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

WORK PROCEDURES

3.1 WORK PROCEDURES

The Contractor shall perform work following practices and procedures described in the Accident Prevention Plan.

A. Lead Hazard Control Areas, Equipment and Procedures

The Contractor shall set up lead hazard control areas and operate equipment within the lead hazard control area in a manner that will minimize migration of lead dust beyond the lead hazard control area boundaries and minimize exposure to workers.

B. Lead Hazard Control Areas

Access into lead hazard control areas by the general public shall be prohibited. Workers entering the lead hazard control area shall meet medical surveillance requirements of this contract and shall be required to understand and follow procedures described in the

Contractor's Accident Prevention Plan for reducing lead exposure. Lead hazard control area preparation and restriction requirements follow:

1. Containment features for interior lead hazard control projects: Polyethylene sheeting sealed with spray adhesive and duct tape and colored caution tape to designate the lead hazard control area. The floor in the lead hazard control area shall be covered with two layers of polyethylene sheeting. The entry/exit shall be sealed with an air lock. Openings, such as HVAC supply and return air vents, into the lead hazard control area shall be sealed with polyethylene sheeting and duct tape or with sealed rigid coverings.
2. Containment features for exterior lead hazard control projects: A roped-off boundary perimeter, using caution tape or a barrier installed at a distance of 20 ft. from where the lead control work is performed.

3.2 USE OF HYGIENE FACILITIES

A. Decontamination

Personnel and equipment shall be decontaminated when exiting the lead hazard control area. The Contractor shall comply with the following personnel and equipment decontamination procedures:

- (1) HEPA vacuum outer garments and equipment.
- (2) Wet Wipe Equipment.
- (3) Remove outer layer of garments.
- (4) Thoroughly wash face and hands, if showering not required.
- (5) Shower (if applicable).
- (6) Remove Respirator (if applicable).
- (7) Exit lead hazard control area.

B. Change Room

The Contractor shall provide, and workers shall use, a change room to change into work clothing at the beginning of a work shift. At the end of the work shift workers shall change back into street clothing and leave contaminated work clothing at the site for disposal or laundering.

C. Eating Facility The Contractor shall provide an eating facility as free as practical from lead contamination. Workers shall be allowed usage of the eating facility for rest/lunch breaks.

3.3 FURNISHINGS

The Contractor shall remove furniture and equipment from the work area before lead hazard control work begins.

3.4 WASTE DISPOSAL PROCEDURES

A. Construction Debris and/or Sanitary Landfill Waste

The Contractor shall dispose of the following waste streams in accordance with RCRA: Building Demolition Debris, used Personal Protective Equipment, and Disposable material from containment structures.

B. Waste Stream Classification

The Contractor shall determine the RCRA waste classification for all waste streams generated by the lead hazard control project by Toxicity Characteristic Leaching Procedure (TCLP) testing. The Contractor shall perform the sampling and analysis specified in paragraph Waste Disposal Sampling, evaluate analytical results and propose waste stream treatment and disposal requirements for the contract. The MdTA and/or MdTA's representative will approve the Treatment Storage and Disposal Facility (TSDF) and the selected waste stream treatment method and disposal requirements proposed by the Contractor.

C. RCRA Subtitle C Hazardous Waste

The Contractor shall dispose of the following waste streams at the RCRA subtitle C Treatment Storage and Disposal Facility or at the RCRA Subtitle C Hazardous Waste Landfill: dust and paint chips from HEPA vacuuming operations, paint sludge, and residue from chemical or heat stripping procedures. The Contractor may temporarily store hazardous waste at the job site provided that the contractor ensures required labels and markings and provides security of containers to prevent disturbance and physical contact of the waste by unknowing or unauthorized persons.

D. Hazardous Waste Transportation and Disposal

The Contractor shall transport, treat and dispose of hazardous waste in accordance with the requirements of federal and state regulations.

3.5 LEAD HAZARD CONTROL PROCEDURES, METHODS AND TECHNIQUES

A. Paint Removal Methods

Prohibited paint removal methods shall include: open flame burning or torching, including the use of heat guns having operating temperatures greater than 1,100 degrees F;

machine sanding or grinding without HEPA exhaust; non-contained hydro blasting or high-pressure water wash; abrasive blasting or sandblasting without HEPA exhaust; dry scraping, except near electrical outlets or when using a heat gun. Chemical paint removers containing methylene chloride are prohibited. Building components and structures adjacent to the removal process shall be appropriately protected from damage due to the removal process employed. Stripping shall be done according to manufacturer's recommendations. Stripped substrates shall be thoroughly washed and neutralized before applying a primer or sealing coat.

B. Low Temperature Heat Gun

Prior to beginning work, electrical fuses and adequate electrical supply shall be verified. Only fuses properly sized for the service, and otherwise permitted by code, shall be used. Properly sized fuses shall not be changed out with larger fuses to increase amperage beyond safe limits. Portable electric generators may be used to safely supply adequate amperage. An accessible garden hose with a pressure-release spray nozzle; a crowbar to remove smoldering wood; and a long-handled sledgehammer to open up walls exposed to smoldering insulation shall be readily available. A fully charged ABC-type (20 pound minimum) fire extinguisher shall be available within 100 feet of the work area. Adequate ventilation shall be provided for the work area. Worker protection shall include respirators equipped with combination HEPA filter/organic vapor cartridges. The Contractor shall equip heat guns with extension tubes or wire mesh as needed to prevent premature burnout of the heating elements and to minimize paint film scorching or smoking. Optimal heat gun/substrate separation is typically 3 to 6 inches.

C. Wet Scraping

Surfaces near electrical outlets shall not be moistened but shall be dry scraped only. Loose material shall be scraped from the surface and deposited onto the containment plastic. Damp scrapings shall be cleaned up as soon as possible to prevent tracking throughout the work area. Scraper blades shall be kept sharp. Additional scraper blades shall be supplied and shall be selected for the type of surface being scraped.

D. Onsite Paint Removal

Paint remover shall be applied in accordance with the manufacturer's instructions. Outdoor application shall only be performed in weather conditions recommended by the manufacturer. The work area surrounding the application process shall be secured to prevent access by children and unauthorized personnel. Workers shall be provided with the appropriate personal protective clothing and equipment in accordance with manufacturer's recommendations and good industrial hygiene practice. A portable eyewash shall be provided whenever eye irritant strippers are used. An abundant source of running water shall be provided in the work area. The stripper shall be tested in a small area prior to full scale stripping. Caustic strippers shall not be used on aluminum or glass surfaces. Waste disposal shall be in accordance with paragraph WASTE DISPOSAL PROCEDURES. Stripped surfaces shall be neutralized and

washed in accordance with manufacturer's instructions and paragraph CHEMICAL PAINT STRIPPER NEUTRALIZER. Stripped surfaces shall be completely dry before repainting, and shall be repainted only with paints proven compatible with the stripping techniques employed. E. Onsite Vacuum-Shrouded Power Tool Use The vacuum shrouds shall be fully engaged while the tool is in use to prevent the escape of lead dust or debris. The Contractor shall utilize power tools equipped with vacuums and high efficiency particulate air (HEPA) filters.

E. Containment

The Contractor shall attach containment walls around and the work and install containment material beneath the work area to catch and contain waste materials. This containment is in addition to the ground covers specified and shall be installed within 10 feet of the areas being impacted and releasing dust and debris.

3.6 CLEARANCE PROCEDURES

A. Visual Inspection

QSHP shall perform a visual inspection for each lead hazard control area to assure that lead hazard control activities, identified in the individual work task data elements, have been properly completed. The QSHP shall visually verify that lead hazards have been removed, control technology has been appropriately applied/installed and that the lead hazard control area is free of dust and paint chips generated by lead hazard control activities.

3.7 EVALUATION OF SAMPLING AND MONITORING RESULTS

Analytical results from samples taken during lead hazard control activities shall be evaluated to determine compliance with occupational safety and health standards.

A. Occupational Safety and Health

The QSHP shall review the analytical results from samples taken for the initial exposure assessment and continued occupational safety and health monitoring if required. Effectiveness and adequacy of personal protective equipment, respirators, work practices, hygiene facilities and personal decontamination procedures shall be evaluated and upgrades/downgrades in equipment and procedures made. After notifying the MdTA and/or MdTA's representative the following shall be applied:

- a. Exposures over the PEL (0.05 mg/cubic meter):
 - 1) Improve work practices to reduce exposures.
 - 2) Don respirators.
 - 3) Assure eating facilities and change rooms are clean and are free from settled dust.
 - 4) Shower as part of personal decontamination.

- b. Exposures over the Action Level (0.03 mg/cubic meter):
 - 1) Assure exposed individuals enrolled in the medical surveillance program.
 - 2) Assure exposed individuals enrolled in and up to date with lead exposure training requirements.

B. Control Efficiency of Containment Features

The QSHP shall review and document results of the visual inspection determining visual clearance criteria are being met while lead hazard control activities are being performed. The QSHP shall review analytical results from samples taken to determine if lead is migrating outside lead hazard control areas at levels in excess of PEL. The QSHP shall notify the MdTA and/or MdTA's representative and apply the following actions if results exceed PEL outside the lead hazard control area:

- 1. Require/improve containment.
- 2. Improve work practices to reduce lead aerosol generation.

C. Removal of Lead Hazard Control Area

Upon acceptance of the final clearance certification by the MdTA and/or MdTA's representative, and when authorized, cleared Lead Hazard Control Area boundary controls and warning signs shall be removed.

3.8 CLEARANCE REPORT

The QSHP shall prepare a clearance report including the following information:

- a. Start and completion dates of lead hazard control activities.
- b. Type of lead hazard control activity performed (i.e., abatement, interim control, renovation, remodeling), locations and lead hazards controlled or abated.
- c. The name and address of each firm conducting lead hazard control activities and the name of each supervisor assigned to the project.
- d. The Occupant Protection Plan prepared pursuant to paragraph OCCUPANT PROTECTION PLAN.
- e. The name, address and signature of the QSHP to indicate clearance requirements have been met.
- f. A detailed written description of the lead hazard control activities performed, including hazard control methods used, locations of rooms and/or components

where lead hazard control activities occurred, reason for selecting particular hazard control methods for each component, and any suggested monitoring of encapsulants or enclosures.

g. Hazardous waste disposal documentation.

3.9 TITLE TO MATERIALS

Materials resulting from demolition work, except as specified otherwise, shall become the property of the Contractor, and shall be disposed of in accordance with federal regulations.

3.10 PAYMENT FOR WASTES

Any lead-contaminated waste produced by the contractor in performance of this contract, including rags produced from wiping the topside of the purlins clean, drilling debris from drilling through the purlins and general paint debris such as paint "chips" or any other waste stream shall be collected in a 55-gallon drum, properly labeled and disposed of in accordance with Section 3.4 of the above specifications. The cost for lead-contaminated waste disposal will be paid from Item No. 403 in the Schedule of Prices- Miscellaneous Contingencies Allowance. Payment for disposal of hazardous and nonhazardous wastes will not be made until a signed copy of the manifest or shipping paper certifying the amount of lead-containing materials delivered to the disposal facility is furnished to the MdTA.

SECTION 03510 - CEMENTITIOUS ROOF DECK

PART 1 – GENERAL

1.1 SCOPE OF WORK

- A. Section Includes: Composite roof deck panel system to be mechanically fastened to the existing purlin structural system prior to the installation of a new modified membrane roofing system.
- B. Related Sections:
1. Division 07550 Modified Bitumen Roofing
 2. Division 07600 Flashing and Sheet Metal

1.2 REFERENCES

- A. ASTM International:
1. ASTM C177 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 2. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 3. ASTM C578 Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 4. ASTM D1621 Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.
 5. ASTM D2842 Standard Test Method for Water Absorption of Rigid Cellular Plastics.
 6. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
- B. Underwriters Laboratories, Inc. (UL):
1. UL Fire Resistance Directory.
 2. UL 580 Standard for Safety for Tests for Uplift Resistance of Roof Assemblies.

1.3 SYSTEM DESCRIPTION

- A. Design Requirements: Provide roof deck assembly designed and tested according to the following:
1. ERS- 1112 (1) hour 5" thick panel.
 2. Underwriters Laboratories UL 580 (UL Class 90 Design): Design No. NM504
- B. Performance Requirements:
1. Provide a roof deck system that has been manufactured, fabricated and installed to provide deflection of less than L/240 at design load.

1.4 SUBMITTALS

- A. Submit under provisions of Section 03510 and General Submittal requirements
- B. Product Data: Submit manufacturer's product data and installation instructions.
- C. Shop Drawings: Provide drawings indicating locations and spacing of planks and purlins.
- D. Samples: Submit selection and verification samples as follows:
 - 1. Set of 12 inch (305 mm) square samples for each wood fiber deck unit required, showing full range of exposed texture to be expected in completed work.
 - 2. Labeled set of all accessories required for a complete installation.
- E. Quality Assurance/Control Submittals: Submit the following:
 - 1. Test Reports: Upon request, submit certified test reports from recognized test laboratories.
 - 2. Certificates: Submit manufacturer's certificate that products meet or exceed specified requirements.
- F. Closeout Submittals: Submit the following:
 - 1. Warranty documents as specified herein.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.
- B. Regulatory Requirements and Approvals: ICC-ES; IERS-1112

1.6 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirement Section.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - 1. Provide labels indicating brand name, deck style, plank size and plank thickness.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
 - 1. Prevent soiling, physical damage or wetting.
 - 2. Store cartons open at each end to stabilize moisture content and temperature.
 - 3. All materials and supplies related to this work shall be stored on pallets at the site.

1.7 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.

PART 2 - PRODUCTS

2.1 ROOF DECK AND FORM SYSTEMS

- A. Composite roof deck panel system to be furnished and installed as per specifications and installation information of acceptable manufacturers.
 - 1. Manufacturers
 - a. Tectum Inc.
 - b. Approved equal

2.2 ROOF DECK DESCRIPTION

- A. Composite roof deck panel system mechanically fastened to the existing structural purlins.

2.3 ROOF DECK PANEL COMPONENTS

- 1. Roof Deck Panels:
 - a. Material: Aspen wood fibers bonded with inorganic hydraulic cement, bonded to EPS foam insulation, bonded to top surface of 7/16 inch (11.1 mm) oriented strand board (OSB).
 - b. Nominal Panel Thickness: 5 inches (128 mm)
 - c. OSB Internal Bond Strength: 50 psi (345 kPa).
 - d. OSB Average Roofing Nail Withdrawal Load: 50 lb (23 kg).
 - e. OSB Average Staple Withdrawal Load: 137 lb (62 kg).
 - f. OSB Average Screw Withdrawal Load: 355 lb (161 kg).
 - g. OSB Maximum Linear Expansion (50 - 90% RH): 0.20%.

2.4 ACCESSORIES

- A. Provide accessories as necessary for a complete installation as per this specification and manufacturers installation information.
 - 1. Panel screws:
 - a. Tru-fast, SIP-HD Fastener
 - 2. Construction Adhesive:
 - a. Manufacturer: Miracle Construction Adhesive.
 - b. Type: Adhesive SFS-66.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Comply with the instructions and recommendations of the roof deck panel manufacturer for the installation of the composite roof deck panels.

3.2 EXAMINATION

A. Site Verification of Conditions:

1. It is the responsibility of the Contractor to verify that the existing site conditions at the roof agree with the contract drawings and that it is acceptable for the installation of their roof deck panel system prior to the commencement of work. The Contractor should contact the MdTA engineer if they feel there is an error or discrepancy with the contract drawings.

3.3 REMOVAL AND INSTALLATION

A. Contractor to is responsible for the demolition and removal of all existing roofing, flashing as well as the concrete deck down to the existing structural purlins.

B. Composite Roof Deck Panel Installation:

1. Place panels on purlins with square cut ends butted together tightly
 - a. Panel are cut to lengths to accommodate (2) spans. Panels will straddle one purlin and be mechanically fastened at both ends. End joints of panels will be staggered.
 - b. Panel ends must bear on existing purlins, and have a minimum of 1 inch bearing. They shall be mechanically fastened to purlins with screws, the size and type as recommended by the manufacturer.
 - c. Panels must be supported by bent plates at all roof transitions. This includes but is not limited to all ridges, valleys, perimeter or other change in direction of the panels. Panels must have a minimum bearing of 1 inch and should be glued and screwed at these transitions.
 - d. Panels should be cut neatly to abut parapets and around all openings and roof penetrations.

3.4 CLEANING

A. Clean exposed surfaces of all deck surfaces.

3.5 PROTECTION

- A. Protect installed work from damage due to weather related moisture.
- B. Protect installed work from damage due to subsequent construction activity on the site so that the work will be without damage and deterioration at the time of acceptance by the Owner.

PART 4 -- MEASUREMENT & PAYMENT

4.01 MEASUREMENT

- A. Items in this section shall not be measured.

4.02 PAYMENT

- A. All items shall be included in and covered by the Lump Sum Price, item no. 401.
- B. The above price shall include all work described in the Section and shown on the Contract Drawings including all labor, materials, services and equipment necessary to complete the work in every respect to the satisfaction of the Engineer.

END OF SECTION 03510

SECTION 06100 ROUGH CARPENTRY

PART 1 - GENERAL

1.01 Related Documents

The provisions of the Contract, the General conditions, the Supplementary Conditions and other Division 7 Specification Sections, apply to the work in this section.

1.02 Related Sections

- A. Section 07550 - Modified Bitumen Roof Membrane
- B. Section 07600 - Flashing and Sheet Metal

1.03 Delivery, Storage and Handling

- A. Time delivery and installation of the carpentry work to avoid delaying other trades whose work is dependent on or affected by the carpentry work. Keep materials dry during delivery.
- B. Store lumber and plywood in stacks with provisions for air circulation within stacks. Protect bottom of stacks against contact with damp or wet surfaces.
- C. Protect exposed materials against water and wind. Remove damaged, or unsuitable material from the job site.

1.04 Quality Assurance

- A. Comply with governing codes and regulations. Use experienced installers.
- B. Lumber Standards: American Softwood Lumber Standard PS 20-70 by the U.S. Department of Commerce.
- C. Plywood Standards: U.S. product Standard PSI-74/ANSI A 199.1 or latest APA Performance Standards for American Plywood Association.
- D. Factory Marking: Mark each piece of lumber or plywood to indicate type, grade, agency providing inspection service.
- E. Size and Shape: Dress lumber 4 sides (S4S) and work to shapes and patterns shown. Nominal sizes shown and specified refer to undressed lumber dimensions. Detailed dimensions show actual lumber size required.

PART 2 - PRODUCTS

2.01 Dimensional Lumber and Plywood

- A. Construction Lumber: Standard Grade Douglas Fir, Western Larch, western Hemlock (WWPA or WCLB) or No. 2 dimension Southern Pine (SPIB).
- B. Exterior Type Plywood: APA Rated Sheathing, EXT.
- C. Bucks, Nailers, Blocking, etc: No. 2 common grade of any WWPA or WCLA species or No. 2 Southern Pine (SPIB).
- D. Anchorage and Fastenings: Provide galvanized steel or other corrosive resistant fasteners , size and finish appropriate for each condition.
- E. Quality: Sound, seasoned, well manufactured materials of longest practical lengths and sizes to minimize joints. Free from warp which cannot be easily corrected by anchoring and attachment. Discard material with defects which would impair quality of work.

PART 3 - EXECUTION

3.01 Examination

- A. Verify measurements and dimensions shown before proceeding with carpentry work. All perimeter drip edge will have new wood nailers installed as per the details provided.
- B. Examine supporting structure and conditions under which carpentry work is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Correlate location of nailers, blocking and similar supports for attached work.
- D. Scribe and cope as required for accurate fit of carpentry work to other work.

3.02 Protection

- A. Protect installed work from damage by other trades until acceptance work.

- B. Attach to substrate securely as required to support applied loading. Countersink bolts and nuts flush with surfaces.
- C. Securely attach wood nailers to substrates in accordance with Factory Mutual Loss Prevention Data Sheet 1-49 and as required by recognized standards.
- D. Provide washers under bolt heads and nuts in contact with wood.
- E. Do not wax or lubricate fasteners that depend on friction for holding power.
- F. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finished material.
- G. Make tight connections between members. Install fasteners without splitting of wood; predrill as required. Do not drive threaded friction type fasteners; turn into place. Tighten bolts and lag screws at installation and retighten as required for tight connections prior to closing in or at completion of work.
- H. Install torchable cant strips at vertical intersections and at all penetrations.

PART 4 – MEASUREMENT & PAYMENT

4.01 MEASUREMENT

- A. Items in this section shall not be measured.

4.02 PAYMENT

- A. All items shall be included in and covered by the Lump Sum Price, item no. 402.
- B. The above price shall include all work described in the Section and shown on the Contract Drawings including all labor, materials, services and equipment necessary to complete the work in every respect to the satisfaction of the Engineer.

END OF SECTION 06100

SECTION 07550 MODIFIED BITUMEN ROOFING

PART 1 – GENERAL

1.1 SCOPE OF WORK

Provide all labor, equipment, and materials to install the modified bitumen roof system over the properly prepared substrate. (See execution, scope of work and details)

1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General Supplementary Conditions and Division 1 Specification Sections apply to this section.
- B. Related work specified elsewhere:
 - 1. Section 07600 - Flashing and Sheet Metal
 - 2. Section 06100 - Rough Carpentry

1.3 REFERENCES

- ASTM D-41 Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofing.
- ASTM D-312 Specification for Asphalt Used in Roofing
- ASTM D-451 Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products
- ASTM D-1079 Terminology Relating to Roofing, Waterproofing and Bituminous Materials
- ASTM D-1227 Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
- ASTM D-1863 Specification for Mineral Aggregate Used on Built-Up Roofs
- ASTM D-2178 Specification for Asphalt Glass Felt Used in Roofing and Waterproofing
- ASTM D-2822 Specification for Asphalt Roof Cement
- ASTM D-2824 Specification for Aluminum-Pigmented Asphalt Roof Coating
- ASTM D-3019 Specification for Lap Cement used with Asphalt Roll Roofing
- ASTM D-4601 Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing
- ASTM D-5147 1991 Test Method for Sampling and Testing Modified Bituminous Sheet Materials
- ASTM D-6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements
- ASTM D-6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements

ASTM E-108	Test Methods for Fire Test of Roof Coverings
FM	Factory Mutual – FM Listings
NRCA	National Roofing Contractors Association
UL	Underwriters Laboratories
WH	Warnock Hersey

1.4 SUBMITTALS

- A. Submit under provisions of Section 07550-Submittals.
- B. Submit certification that the roof system furnished is approved by Factory Mutual, or Warnock Hersey for external fire E-108 Class 1A and that the roof system is adhered properly to meet or exceed Factory Mutual I-90. All manufactures certificates must meet and /or exceed the requirements of the FM I-90 listings. All manufactures must meet and /or exceed FM approval Standard 4470.
- C. Product Data for each type of product specified including manufacturer's technical product data, installation instructions and recommendations for each type of roofing product required. Include data substantiating that materials comply with specified requirements.
- D. For all modified bituminous sheet roofing, include independent test data according to ASTM designation D-5147-91 "Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material", substantiating that materials comply with specified requirements.
- E. Any material submitted as an equal to specified material must also submit a list of three jobs where the proposed material has been used in a similar roofing system as that which is specified and within 50 mile radius from the location of the specified job and a minimum of 400,000 sq. Ft. of exact system specified. In addition, the three jobs must be at least six years old and be available for the owner, or Owner's Representative to inspect.
- F. Show evidence that the products and materials are manufactured in the United States and that materials provided conform to all requirements specified herein, and are chemically and physically compatible with each other and are suitable for inclusion within the total roof system specified herein.
- G. Show evidence that the Installer specializes in modified bituminous roof application with a minimum 5 years experience and who is certified by the roofing system manufacturer as qualified to install manufacturers' roofing materials.
- H. Provide a sample of each product.
- I. Manufacturer's warranty.

- J. Certified copy of ISO 9001 compliance.
- K. Sample of roofing aggregate.
- L. Any deficiencies in performance, warranty terms or improper submittal procedure will constitute grounds for immediate rejection of alternate. All alternate data must be submitted in triplicate and notarized by a third party testing facility before the Owner and / or Engineer will compare to the specified Maryland Transportation Authority minimum standard specification requirement.

1.5 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Roofing system manufacturer shall have a minimum of 25 years experience in manufacturing modified bitumen roofing products in the United States and be ISO 9001 certified.
- B. **Installer Qualifications:** Installer (Roofer) shall be specializing in modified bituminous roof application with minimum 5 years experience and who is certified by the roofing system manufacturer as qualified to install manufacturer's roofing materials.
- C. It is the intent of this specification to provide a roof system with an external fire rating. The descriptions given below are general descriptions. The insulation, recovery board, and other components shall be required by the membrane manufacturer to provide a Class A fire resistance rating.
- D. **Installer's Field Supervision:** Require Installer to maintain a full-time Supervisor/Foreman on job site during all phases of modified bituminous sheet roofing work and at any time roofing work is in progress, proper supervision of workmen shall be maintained. A copy of the specification shall be in the possession of the Supervisor/Foremen and on the roof at all times. Supervisor/Forman shall speak and understand fluent English.
- E. It shall be the Contractors responsibility to respond immediately to correction of roof leakage during construction. If the contractor does not respond within 24 hours, the Owner has the right to hire a qualified contractor and back charge the original contractor.
- F. **Pre-application Roofing Conference:** Approximately 2 weeks before scheduled commencement of modified bitumen sheet roof system installation, and associated work, meet at project site with installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in the around roofing must precede or follow roofing work (including mechanical work if any), Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of the Work, including (where applicable) Owner's insurers, test agencies and governing authorities.

Objectives to include:

1. Review foreseeable methods and procedures related to roofing work.
2. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by other trades.
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 required submittals both completed and yet to be completed.
6. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment and facilities needed to make progress and avoid delays.
7. Review required inspection, testing, certifying and material usage accounting procedures.
8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not mandatory requirement).
9. Record (contractor) discussion of conference including decisions and agreements (or disagreements) reached and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
10. Review notification procedures for weather or non-working days.

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 and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface. Stand all roll materials on end. Cover roll goods with a canvas tarpaulin or other breathable material (not polyethylene).
- C. Do not leave unused materials on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.
- D. It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the contractor will be the sole responsibility of the contractor and will be repaired or replaced at his expense.

1.7 MANUFACTURER'S INSPECTIONS

- A. When the project is in progress, the Primary Roofing System Manufacturer will provide the following:
1. Keep the Owner informed as to the progress and quality of the work as observed.
 2. Provide job site inspections a minimum of 5 days a week and provide the owner with a digital photographic record of the work in progress.
 3. Report to the Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
 4. Confirm after completion of the project and based on manufacturer's observation and tests that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.8 PROJECT CONDITIONS

- A. Weather Condition Limitations: Do not apply roofing membrane during inclement weather or when a 40% chance of precipitation is expected.
- B. Do not apply roofing insulation or membrane to damp deck surface.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- D. 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.

1.9 SEQUENCING AND SCHEDULING

- A. Sequence installation of modified bituminous sheet roofing with related units of work specified in other sections to ensure that roof assemblies including roof accessories, flashing, trim and joint sealers are protected against damage from effects of weather, corrosion and adjacent construction activity.
- B. All work must be fully completed on each day. Phased construction will not be accepted.

1.10 WARRANTY

- A. Upon completion of installation, and acceptance by the Owner and Manufacturer, the manufacturer will supply to the Owner the appropriate 25 year warranty. This comprehensive warranty shall cover all metal components and entire roof system installed for the length of the entire warranty period. Final payment will not be made until this occurs.

- B. Contractor will submit a minimum of a (5) five-year warranty to the membrane manufacturer with a copy directly to Owner. Final payment will not be made until this occurs.
- C. Membrane manufacturer will provide an annual inspection for the life of the warranty at no additional cost to the owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. When a particular trade name or performance standard is specified it shall be indicative of a minimum standard required.
- B. Provide products as manufactured to the minimum standards of the MdTA or approved equal.
- C. Any item or materials submitted as an alternate to the Maryland Transportation Authority minimum standard specified must comply in all respects as to the quality and performance of the minimum standard specified. All materials submitted must be notarized by a third party testing facility and submitted in triplicate. The roof system manufacture must provide the owner all the required additional services at "no additional charge"(i.e.. annual inspections, roof surveys, site inspections, progress report etc..)
- D. The Owner / Engineer shall be the sole judge as to whether or not an item submitted as an equal is truly equal. Should the contractor choose to submit on the equal basis, he shall assume all risk involved, monetary or otherwise should the Owner find it unacceptable.

2.2 DESCRIPTION

- A. Modified bituminous sheet roofing work including but not limited to:
 - 1. Two plies of approved ASTM D-4601 Type II glass fiber base sheet bonded to the prepared substrate with bitumen. Approved base sheets must weigh at least twenty-five pounds per square.
 - 2. The standard bitumen will consist of a low V.O.C. compliant, non-asbestos containing cold applied adhesive for roof slopes up to ½:12.
 - 3. All flashings will be two (2) ply heat fused membrane. The first ply will consist of SBS base flashing ply covered by an additional layer of white modified mineral bitumen membrane.

- 4. The white mineral modified field and flashing membrane will be:
 - a. Modified Mineral Membrane – Field Membrane
80 mil SIS and SBS and ES - Recycled modified cap sheet- white starburst mineral(Styrene-Isoprene-Styrene and Styrene-Butadiene-Styrene and Ethylene Styrene) rubber modified roofing membrane reinforced with a dual fiberglass scrim and polyester mat.
 - b. Modified Mineral Membrane – Flashing Membrane
195 mil SBS - Recycled modified cap sheet – white starburst mineral cap sheet(Styrene-Isoprene-Styrene and Styrene-Butadiene-Styrene and Ethylene Styrene) rubber modified roofing membrane reinforced with a dual fiberglass scrim and polyester mat. White Starburst Mineral – 63% reflectivity.
- 5. The surfacing will be a white Kynar energy star approved coating manufactured by the prime roof membrane system manufacture. All performance criteria must be met in Section 07550 – 2.5.

2.3 BITUMINOUS MATERIALS

- B. Asphalt Primer: V.O.C. compliant, ASTM D-41.
- C. Asphalt Roofing Mastic: V.O.C. compliant, ASTM D-2822, Type II.
- D. Higher Slope Cold Applied Membrane Adhesive: V.O.C. compliant ASTM D-3019.

Performance Requirements:

1. Non-Volatile Content	ASTM D-4479	70%
2. Density ASTM D-1475	7.89 lb./gal.	
3. V.O.C. ASTM D-3960	300 gal/l max.	
4. Viscosity Stormer Special Blade	ASTM D-562	16-20 sec.
5. Flash Point	ASTM D-93	100°F min.
6. Slope	½:12 - 2:12	

- F. Cold Applied Cold Adhesive

Performance Requirements:

1. Density ASTM D-1475	9.1 lb./gal.	
2. V.O.C. ASTM D-3960	285 g/l max.	
3. Viscosity Stormer Special Blade	ASTM D-4449	20-25 sec.

- | | | |
|-------------------------|-------------|-------|
| 4. Flash Point | ASTM D-93 | 100°F |
| 5. Non-Volatile Content | ASTM D-4479 | 75% |

G. Brush Grade Flashing Adhesive

Performance Requirements:

- | | | |
|-------------------------|-------------|--------------|
| 1. Non-Volatile Content | ASTM D-4479 | 70 min. |
| 2. Density | ASTM D-1475 | 8.6 lb./gal. |
| 3. V.O.C. | ASTM D-3960 | 295 g/l max. |
| 4. Flash Point | ASTM D-93 | 100°F |

2.4 SHEET MATERIALS

A. Base Plies

1. Base Sheet: ASTM D-4601, Type II, Heavy Base

2.4 SHEET MATERIALS

A. Base Plies

1. Two plies of approved ASTM D-4601 Type II SBS base sheet to the prepared substrate with cold adhesive.
2. Base sheet secured to the substrate per Factory Mutual I-90 listing and required by the roof system manufacture.

B. Base Flashing Ply

1. SBS modified membrane with woven fiberglass scrim reinforcement with the following minimum performance requirements according to ASTM D-5147.

PROPERTIES: BASE FLASHING MEMBRANE

Tensile Strength (ASTM D-5147)

2 in/min. @73.4°F MD 205 lbf/in CMD 220 lbf/in

Tear Strength (ASTM D-5147)

2 in/min. @ 73.4 °F MD 325 lbf CMD 325 lbf

Elongation at Maximum Tensile (ASTM D-5147)

2 in/min. @ 73.4 °F MD 4.0% CMD 4.0%

C. Finished Recycled Modified Membrane / Field and Flashing membrane

PROPERTIES: FINISHED MEMBRANES

3. **White Modified Mineral - Modified Membrane - Recycled modified white starburst -FR mineral cap sheet – Finished Field Membrane.**

ASTM D-6162 Type III Grade S

Tensile Strength (ASTM D-5147)

2 in/min. @ 73.4 °F

MD 700 lbf/in CMD 750 lbf/in

Tear Strength (ASTM D-5147)

2 in/min. @ 73.4 °F

MD 1300 lbf CMD 1400 lbf

Elongation at Maximum Tensile (ASTM D-5147)

2 in/min. @ 73.4 °F

MD 6.0% CMD 6.0%

Low Temperature Flexibility (ASTM D-5147) Passes -40°F (-40°C)

Reflectivity

63 %

2. **Modified Membrane - Recycled modified cap sheet – Finished Heat Fused Flashing Membrane**

ASTM D-6162 Type III Grade S

Tensile Strength (ASTM D-5147)

2 in/min. @ 73.4 °F

MD 310 lbf/in CMD 310 lbf/in

Tear Strength (ASTM D-5147)

2 in/min. @ 73.4 °F

MD 510 lbf CMD 510 lbf

Elongation at Maximum Tensile (ASTM D-5147)

MD 6.0% CMD 6.0%

Low Temperature Flexibility (ASTM D-5147) Passes -40°F (-40°C)

Reflectivity

63 %

SBS/SIS/ES modified cap sheet must meet factory mutual test 4470 and all of criteria set forth in the factory mutual test 4470. This test must have approvals dating back at least Five (5) years. This test cannot have new approvals as it is a continuing monitor of manufacturing quality and field performance. This test must be performed using the exact insulation, decking, and modified built up roofing system as specified. Similar applications which are not exact will not be considered.

Primary roofing system manufacturer SBS/SIS/ES (Styrene Butadiene Styrene/Styrene Isoprene Styrene and Ethylene Styrene) must meet the following criteria:

1. Must have been manufacturing modified cap sheets for a period not less than 25 years. In the same configuration specified.
 - a. Invoices proving polymer purchases may be requested by the owner/architect verification.
2. Primary manufacturer must submit documentation and verification that this exact configuration including decking, insulation and modified built up roofing system (SBS/SIS/ES modified cap sheet and number of ply's of the specified base sheets, adhered with the specified adhesive) has been installed and performing satisfactory for a period of not less than fifteen (15) years and a minimum of 400,000 square feet, as well as a letter from Consultant / Factory Mutual verifying material FM listing. A letter from factory mutual is only needed if the owner is insured by Factory Mutual. In order to obtain a true comparison under the same weather conditions, these applications must be within a 50 mile radius of the specified project location.
3. The primary manufacturer must be currently certified by the International Organization for Standardization, as meeting the minimum quality assurance standards outlined in the I.S.O. 9001 Program, and shall be registered in the current listing of I.S.O. certified manufacturers.
4. Primary manufacturer must make annual follow up inspections on the finished roofing areas annually. Provide to the owner/any maintenance recommendations.
5. Primary manufacturer must inspect the job on a daily basis and submit weekly / bi-weekly reports to the owner/architect to insure proper installation procedures are being followed in accordance with the written specification.
6. Primary manufacture must provide a 25 year warranty including the system materials and workmanship as per the written specifications.
7. In order to be considered as an approved equal for this project all of the above verified testing information must be submitted by the responsive bidder in triplicate not later than ten (10) days prior to the bid date. In addition all verified testing of materials must be submitted, notarized and tested by an accredited third party testing facility. All manufacture technical data sheets will not be accepted.

2.5 SURFACINGS

- A. White Kynar Coating – Energy Star Approved Coating
Weathering ASTM D-4798, No deterioration over 1000 hours per ASTM G-26 test requirements.
Elongation ASTM D-1475, 250% minimum
Reflectivity: Typical 90%
Solar Reflective Index - ASTM E-1980 - 113
Color: White
Emittance: 85
Tensile Strength: 250 psi minimum

2.6 RELATED MATERIALS

- A. Roof Insulation: Reference Section 07220 - Roof and Deck Insulation for requirements.
- B. Roof Insulation Fasteners: Reference Section 07220 - Roof and Deck Insulation for requirements.
- C. Base Sheet: shall meet the requirements of ASTM D-4601 Type II and be recommended, approved and furnished by the membrane manufacturer.
- D. Nails and Fasteners: Non-ferrous metal or galvanized steel, 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 deck material. Nails and fasteners shall be flush-driven through flat metal discs of not less than 1-inch diameter. Metal discs may be omitted when one-piece composite nails or fasteners with heads not less than 1-inch diameter are used.
- D. Metal Discs: Flat discs or caps of zinc-coated sheet metal not lighter than 28 gauge and not less than 1-inch in diameter. Discs shall be formed to prevent dishing. Bell or cup shaped caps are not acceptable.

PART 3 - EXECUTION

3.1 EXAMINATION

Examine substrate surfaces to receive modified bitumen sheet roofing system and associated work and conditions under which roofing will be installed. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to Roof System Manufacturer.

3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore other work damaged by installation of the bituminous roofing system work.
- B. Coordinate installing roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight. Provide cut-offs at end of each day's work to cover exposed ply sheets and insulation with two (2) plies of #15 organic roofing base sheet with joints and edges sealed with roofing cement. Remove cut-offs immediately before resuming work.
- C. Cold applied membrane adhesive coverage rates for interply application (2 to 2-1/2) two to two and a half gallons per 100 square feet (plus or minus 25% on total job average basis.)
- D. Substrate Joint Penetrations: Prevent bitumen from penetrating substrate joints, entering building or damaging roofing system components or adjacent building construction.
- E. Apply roofing materials as specified herein unless recommended otherwise by manufacturer's instructions. Keep roofing materials dry before and during application. Do not permit phased construction. Complete application of roofing plies, modified sheet and flashing in a continuous operation. Begin and apply only as much roofing in one day as can be completed that same day.
- F. Cut-Offs: At end of each day's roofing installation, protect exposed edge of incomplete work, including ply sheets and insulation. Provide temporary covering of two (2) plies of #15 organic roofing felt set in full moppings of bitumen with joints and edges sealed.

3.3 BASE SHEET SECURED TO THE SUBTRATE

Secure the base sheet one (1) ply directly to the substrate per Factory Mutual I-90 manufactures listing and in accordance to the prime manufactures recommendations. All roof sections will require a base sheet secured to the substrate prior to the installation of the insulation. All areas shall be inspected by the roof system manufacture prior to the application of the complete roof system.

3.4 BASE PLY INSTALLATION

- A. Base Plies: Install (2) two base sheets in 2 to 2-1/2 gallons per ply per square of bitumen shingled uniformly to achieve two plies throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing. Prior to installation, cut sheets into 18' lengths and allow to relax.
- B. Lap ply sheet ends eight inches. Stagger end laps twelve inches minimum.

- C. Extend plies two inches beyond top edges of cants at wall and projection bases.
- D. Install base flashing ply to all perimeter and projection details.
- E. Allow the two plies of base sheet to cure at least thirty minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

3.5 HPR MODIFIED MEMBRANE APPLICATION

- A. The modified membrane shall then be solidly bonded to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
- B. The 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.
- C. Subsequent rolls of modified shall be installed across the roof as above with a minimum of 4" side laps and 8" end laps. The end laps shall be staggered. The modified membrane shall be laid in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
- D. For best results, allow the cold adhesive to set for five to ten minutes before installing the top layer of modified membrane.
- E. Extend membrane 2" minimum above the top edge of all cants in full moppings of the cold adhesive.

3.6 FLASHING MEMBRANE INSTALLATION (GENERAL)

- A. All curb, wall and parapet flashings shall be sealed with an application of mastic and mesh on a daily basis. No condition should exist that will permit moisture entering behind, around or under the roof or flashing membrane.
- B. Prepare all walls, penetrations and expansion joints to be flashed and where shown on the drawings with asphalt primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
- C. All plies will be adhered with Flashing Adhesive, unless otherwise specified. The modified membrane will be used as the flashing and nailed off 8" O.C. at all vertical surfaces. Two plies of base sheet will be fully adhered with the cold flashing adhesive and one ply of the white mineral cap sheet will be installed for the final flashing ply of the system. Three (3) plies in total.

- D. The entire sheet of flashing membrane must be solidly adhered to the substrate.
- E. Seal all vertical laps of flashing membrane with a three-course application of Flashing Adhesive and fiberglass mesh.
- F. Counter flashing, cap flashings, expansion joints, and similar work to be coordinated with roofing work are specified in other sections.
- G. Roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices to be coordinated with modified bituminous roofing system work are in other sections.

3.7 APPLICATION OF SURFACING

- A. Prior to installation of surface, obtain approval from manufacturer as to work completed.
- B. White Kynar Coating for all flashing and exposed roof areas.
 - 1. Allow all cold applied modified roof system to properly dry and cure before installing the white coating. (Cure time to be recommended by the roof system manufacture)
 - 2. Roll and / or brush apply white Kynar at a rate of (1) gallon per 100 square feet/ coat is required. Paint all exposed membrane with manufacturer's White Kynar coating installed at a rate of 1 gallon per square per coat. This shall be a two-coat application with the finished stroke in one direction.

3.8 CLEANING

- A. Remove drippage of bitumen from all walls, windows, floors, ladders and finished surfaces.
- B. In areas where finished surfaces are soiled by bitumen or any other sources of soiling caused by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their instructions.

3.9 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Installer, installer of associated work, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.

- B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party attending.
- C. The Roofing System Manufacturer reserves the right to request a thermographic scan of the roof during the roof installation and / or final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the Roofing Contractor at a negotiated price.
- D. If core cuts verify the presence of damp or wet materials, the Roofing Contractor shall be required to replace the damaged areas at his own expense.
- E. Repair or replace (as required) deteriorated or defective work found at time above inspection to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- F. The Contractor is to notify the Owner upon completion of corrections.
- G. Following the final inspection, acceptance will be made in writing by the material manufacturer and all warranty papers will be processed.

PART 4 – MEASUREMENT & PAYMENT

4.01 MEASUREMENT

- A. Items in this section shall not be measured.

4.02 PAYMENT

- A. All items shall be included in and covered by the Lump Sum Price, item no. 402.
- B. The above price shall include all work described in the Section and shown on the Contract Drawings including all labor, materials, services and equipment necessary to complete the work in every respect to the satisfaction of the Engineer.

END OF SECTION 07550

**SECTION 07600 FLASHING AND SHEET METAL
PART 1 – GENERAL**

1.1 SCOPE OF WORK:

Provide all labor, equipment, and materials fabricate and install the following.

1. Counterflashings over bituminous base flashing.
2. Counterflashings at vent stacks.
3. Base flashing coverings.
4. Coping cap at parapets.
5. Gutters and down spouts.
6. Counterflashings at walls and penetrations.
7. Lead flashing for bituminous membranes.

1.2 RELATED SECTIONS

- A. Drawing and general provisions of the Contract, including General Supplementary Conditions and Division 1 Specification Sections, Apply to this Section.
- B. RELATED SECTIONS
1. Section 07550 - Modified Bitumen Roofing
 2. Section 06100 – Rough Carpentry

1.3 REFERENCES

ASTM A-446	Specification for steel sheet
ASTM B-209	Specification for aluminum sheet
ASTM B-221	Specification for aluminum extruded shape
FS QQ-L-201	Specification for Lead Sheet
ASTM A792	Steel Sheet, Aluminum-Zinc Alloy-Coated, by the Hot-Dip Process
ASTM B32	Solder Metal
ASTM B209	Aluminum and Alloy Sheet and Plate
ASTM B486	Paste Solder
ASTM D226	Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D486	Asphalt Roof Cement, Asbestos-free
FS O-F-506	Flux, Soldering, Paste and Liquid
WH	Warnock Hersey International, Inc. Middleton, WI.
FM	Loss Prevention Data Sheet
NRCA	National Roofing Contractors Association - Roofing Manual
SMACNA	Architectural Sheet Metal Manual

1.4 SUBMITTALS

- A. Submit under provisions of Section 07550 - Submittals.
- B. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Section 01300.
- C. Provide approval letters from metal manufacturer for use of their metal within this particular roofing system type.
- D. Submit two samples, 12 x 12 inch in size illustrating typical external corner, internal corner, valley, junction to vertical dissimilar surface, material and finish.
- E. Shop Drawings
 - 1. For manufactured and shop fabricated gravel stops, fascia, scuppers, 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.
- F. Certification
 - 1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.
 - 2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.
 - 3. Submit certification that metal and fastening system furnished is Tested and Approved by Factory Mutual for I-90 Wind Up-Lift Requirements.
- B. 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 CONTROL

A. Reference Standards

1. Comply with details and recommendations of SMACNA Manual for workmanship, methods of joining, anchorage, provisions for expansion, etc.
2. Factory Mutual Loss Prevention Data Sheet 1-49 windstorm resistance 1-90.

B. Manufacturer's Warranty

Pre-finished metal material shall require a written 30-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. The metal and the modified roof system must be covered under one (1) warranty by the same system manufacture.

C. Contractor's Warranty

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 five years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof. Final payment will not be made until this occurs.

1.6 QUALIFICATIONS

Fabricator and Installer: Company specializing in sheet metal flashing work with 5 years experience.

1.7 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.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Metal system is to be comprised of minimum .040 Aluminum, coated on both sides with an epoxy primer and on the weathering surface with a polyvinylidene fluoride or siliconized polyester baked organic coated finish.

Materials

- a. .040 Aluminum

Aluminum coated steel, ASTM A792, coating designation AZ-50, in thickness of .0217 nom. / .040 Aluminum 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.

- b. Steel Finishes: siliconized modified polyester finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer. Weathering finish as referred by National Coil Coaters Association (NCCA).
- c. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer. Weathering finish as referred by National Coil Coaters Association (NCCA).
- d. Colors shall be chosen by owner. Standard Kynar 500 finish coating is accepted.

- B. Miscellaneous Metals and Flashings:

1. Zinc-Coated Steel Sheet: ASTM A526, 0.20% copper, 26 gage (0.0179"); designation G90 hot-dip galvanized, mill phosphatized.
2. Stainless Steel Sheet: Type 302/304, ASTM A167, 28 gage, (0.015"), annealed except dead soft where fully concealed by other work, 2D (dull) finish.
3. Copper Sheet: ASTM B370, 16 oz. (0.0216), temper H00 (cold-rolled).
4. 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").
5. Zinc Alloy Sheet: Zinc with 0.6% copper and 0.14% titanium; 0.27" thick (21 gauge); standard (soft) temper, mil finish.

2.3 RELATED MATERIALS

- A. Metal Primer: Zinc chromate type.
- B. Plastic Cement: ASTM D 4586
- C. Sealant: Specified in Section 07900 or on drawings.
- D. Lead: Meets Federal Specification QQ-L-201, Grade B, four pounds per square foot.
- E. Solder: ANSI/ASTM B32; 95/05 type.
- F. Flux: FS O-F-506.
- G. Underlayment: ASTM D2178, No15 asphalt saturated roofing felt.
- H. Slip Sheet: Rosin sized building paper.
- I. Fasteners:
 - 1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.
 - 2. Fastening shall conform to Factory Mutual I-90 requirements or as stated on section details, whichever is more stringent.
- J. Termination Bars:
 - 1. Shall be aluminum unless otherwise recommended by membrane manufacturers.
 - 2. Material shall be .125" x 1" (minimum) aluminum conforming to ASTM B-221, mill finish. Bar shall have caulk cup as required.

PART 3 - EXECUTION

3.1 PROTECTION

Protect 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 SMACNA Architectural Sheet Metal Manual, Factory Mutual I-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. Metal fascia and copings shall be secured to wood nailers at the bottom edge with a continuous cleat. Cleats shall be at least one gauge heavier than the metal it secures.

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 MANUFACTURED SHEET METAL SYSTEMS

- A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.
- B. Furnish and install manufactured sheet metal systems in strict accordance with manufacturer's printed instructions.
- C. Provide all factory-fabricated accessories including, but not limited to, fascia extenders, miters, scuppers, joint covers, etc.

3.5 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 gravel stop fascia system, cap flashing, and surface-mount counterflashing shall be formed with a 1/4" opening between sections. The opening shall be covered by a cover plate or backed by an internal drainage plate formed to the profile of fascia piece. The cover plate shall be embedded in mastic, fastened through the opening between the sections and loose locked to the drip edges.
- G. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.

PART 4 - MEASUREMENT & PAYMENT

4.01 MEASUREMENT

- A. Items in this section shall not be measured.

4.02 PAYMENT

- A. All items shall be included in and covered by the Lump Sum Price, item no. 402.
- B. The above price shall include all work described in the Section and shown on the Contract Drawings including all labor, materials, services and equipment necessary to complete the work in every respect to the satisfaction of the Engineer.

END OF SECTION 07600

SECTION 221426 - STORM DRAINAGE PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to the work specified in this section.

1.2 SUMMARY

- A. This Section includes storm-drainage piping inside the building for the secondary roof drain.

1.3.1 DEFINITIONS

- A The following are industry abbreviations for plastic piping materials:
 - 1. ABS: Acrylonitrile -butadiene-styrene plastic.

1.4 PERFORMANCE REQUIREMENTS

- B. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:
 - 1. Storm Drainage Piping: 10-foot head of water (30 kPa).

1.5 SUBMITTALS

- A. Product Data: For pipe, tube, fittings, and couplings.
- B. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

PART 2 – PRODUCTS

2.1 PIPING MATERIALS

- A. ABS Pipe: ASTM D 2661, Schedule 40, solid wall.

1. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
- B. ABS Special Fittings: ASTM F 409, drainage-pattern tube and tubular fittings with ends as required for application.

2.2 ROOF DRAINS

- A. Furnish and install 12" diameter roof drain. Drain shall consist of 5" galvanized cast iron, dome strainer, gravel guard, clamping ring and drain bowl. Contractor to supply schedule 40 drain body extension if necessary, underside clamp and flexible expansion joint. Provide S.S. clamps and hardware.

2.3 MANUFACTURERS

Jay R. Smith Mcg. Co.
Johns Manville Roofing System
Portal Plus, Inc.
Approved equal.

PART 3 – EXECUTION

3.1 PIPING INSTALLATION

- A. Make changes in direction for storm piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- B. Install storm drainage piping at 2 percent downward in direction of flow.
- C. Install ABS storm drainage piping according to ASTM D 2661.
- D. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.2 HANGER AND SUPPORT INSTALLATION

- A. Install hangers for ABS and PVC piping with the following maximum horizontal spacing and minimum rod diameters:
 1. NPS 4 and NPS 5 (DN 100 and DN 125): 48 inches (1200 mm) with 5/8-inch (16-mm) rod.

2. NPS 6 (DN 150): 48 inches (1200 mm) with 3/4-inch (19-mm) rod.

- B. Install supports for vertical ABS and PVC piping every 48 inches (1200 mm).
- C. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.3 CONNECTIONS

- A. Connect storm drainage piping to overflow roof drains.
- B. Storm Sewer: To above grade discharge nozzle.

3.5 FIELD QUALITY CONTROL

- A. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
 - 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 - 2. Leave uncovered and unconcealed new, altered, extended, or replaced storm drainage piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 - 3. Test Procedure: Test storm drainage piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water (30 kPa). From 15 minutes before inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.
 - 4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 - 5. Prepare reports for tests and required corrective action.

3.6 CLEANING

- B. Clean interior of piping. Remove dirt and debris as work progresses.
- C. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

- D. Place plugs in ends of uncompleted piping at end of day and when work stops.

PART 4 – MEASUREMENT & PAYMENT

4.01 MEASUREMENT

- A. Items in this section shall not be measured.

4.02 PAYMENT

- A. All items shall be included in and covered by the Lump Sum Price, item no. 402.
- B. The above price shall include all work described in the Section and shown on the Contract Drawings including all labor, materials, services and equipment necessary to complete the work in every respect to the satisfaction of the Engineer.

END OF SECTION 221426