MARYLAND TRANSPORTATION AUTHORITY
Baltimore, Maryland

Invitation for Bids

WILLIAM PRESTON LANE, JR. MEMORIAL BRIDGE

Maryland
Transportation
Authority

Contract No. LB 2038-000-002

ROOF REPLACEMENT MAINTENANCE AND ADMINISTRATION BUILDINGS

ANNAPOLIS, MARYLAND

September 2008

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.
- 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). Do not leave any items blank.
- When tabulating your final price, make sure all your calculations are correct.
- Minority Business Enterprise Attachments A and B must be completed and submitted with your bid. If either of these attachments is missing your bid is non-responsive. Attachments C and D **should not** be submitted at time of bid.
  For additional information on how to complete the MBE Attachments, please see the insert named "Important Information regarding MBE Utilization and Bidding Requirements" located in the IFB.
- The Bid/Proposal Affidavit must be completely filled out and signed by all of 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

IMPORTANT INFORMATION REGARDING MBE UTILIZATION AND BIDDING REQUIREMENTS

The Maryland Transportation Authority (the "Authority") has been forced to reject many recent bids/proposals due to bid submissions that were not in strict compliance with the stipulated MBE rules and regulations. The following checklist has been developed to highlight certain critical components of the MBE program requirements. This listing is not all-inclusive and the bidder **must** comply with all MBE rules and regulations listed throughout this entire proposal book.

Attachment A (Certified MBE Utilization and Fair Solicitation Affidavit) & Attachment B (MBE Participation Schedule) must be included with the submittal of the bid or offer. If the bidder or offeror fails to submit these forms with the bid/offer as required, the Procurement Officer **shall deem the bid non-responsive** or shall determine that the **offer is not reasonably susceptible** of being selected for award. MBE Prime Contractors must achieve the established MBE goal with other certified MBE contractors. A Prime MBE Contractor **can not** count itself as an MBE to obtain the goal.

ATTACHMENT A

When filling out Attachment A, make sure you complete the following:

- If after making good faith efforts, you determine you can not achieve the established overall goal or subgoals, you must request a waiver.
- List the percentage(s) of the overall goal(s) that you are able to achieve.
- If you do not request the waiver at time of bid and you **are not** meeting the established goal(s), your bid/offer will be considered **non-responsive or not reasonably susceptible of being selected for award.**
- Attachment A must be signed and dated.

ATTACHMENT B

When filling out Attachment B, make sure you have included the following:

- Prime Contractor's name, address and phone number.

- Project description.
- Project number.
- Total contract dollar amount. This amount must match the submitted bid price.
- List the minority firm name, certification number, work to be performed, dollar amount and/or percentage amount.
- Clarify for each sub-contractor if it will provide services, is a supplier or will supply and install.
- It is the Contractor's responsibility to ensure that the proposed subcontractors are certified to perform the proposed work. All Contractors are to submit an approvable MBE plan at time of bid. Approvable means, the subcontractors are certified in the applicable SIC/NAIC Codes through MDOT and can perform the proposed work for the required participation goal. Contractors pending MBE certification at time of bid are **not** eligible for participation. If you submit a firm that is not certified to perform the proposed work and your contract falls short of the established MBE goal, your firm will be considered **non-responsive**. Prime Contractors are strongly encouraged to check the MDOT database at www.mbe.mdot.state.md.us to see if the subcontractor is certified to perform the work and to make sure the subcontractor has not graduated from the listed NAIC codes. If you have questions after checking the data base, you may contact the Authority MBE Office at 410-537-1048 for further assistance.

  If you are using a supplier, the 60% rule applies. Please refer to the MBE Manual for the description of the 60% rule.

  Please provide details on how you arrived at the 60% on Attachment B under the dollar amount. (i.e. – $150,000.00 X 60% = $90,000.00)

- If you are requesting a third tier relationship, you must state that request on the Attachment B form under work to be performed. Please note: Third Tier MBE/DBE subcontracting will be approved by the Authority only when the Authority is satisfied that there is no way except by Third Tier contracting that an MBE/DBE goal can be achieved. Specifics as to why a Third Tier contracting agreement must be included.

- The summary at the bottom of Attachment B must be filled out with the total overall MBE participation, Total African-American MBE participation, and the Total Women-Owned MBE participation.

- Attachment B must be signed by the preparer.

- If you are the apparent low bidder, you will receive a letter from the Authority requesting your MBE Attachment C (Outreach Efforts Compliance) and Attachment D (Subcontractor Project Participation Statement). You will have ten (10) working days to submit the attachments to the Authority. If you requested a waiver at time of bid, all of the back up documentation that complies with COMAR 21.11.03.11, must be submitted within the ten working days with Attachments C & D.

- If the apparent low bidder fails to return the required documentation within the allotted ten (10) days, the Procurement Officer may determine that the apparent low bidder is not responsible and therefore not eligible for contract award.

- When Attachments C & D are submitted they must have the identical subcontractors and dollar amount(s) listed on them as were listed on the previously submitted Attachments A & B. Failure to comply will result in your bid being non-responsive.

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NOTICE TO BIDDERS

A "Pre-Bidding 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 **September 16, 2008**, at the Bay Bridge Facility, 850 Revell Highway, Annapolis, MD. 21401. While attendance at the Pre-Bid conference is not mandatory, this is the offeror's opportunity to raise questions and/or issues of concern regarding the project.

Maryland
Transportation
Authority

SP 1-1 PROJECT DESCRIPTION

CONTRACT NO.:	**LB 2038-000-002**
TITLE:	Roof Replacement Maintenance and Administration Buildings
FACILITY:	William Preston Lane, Jr. Memorial Bridge
LOCATION:	Annapolis, MD
ADVERTISED:	**September 2,2008**
PRE-BID MEETING:	**10:00 a.m. on September 16, 2008** in the 2nd Floor Conference Room at the Bay Bridge Administration Building at 850 Revell Highway, Annapolis, MD 21401.
PROJECT CONTACT:	Project Manager: Mr. John Jewell (410) 537-7816 Contract Administration: Ms. Maggie Johnson (410) 537-7807
BIDS DUE:	**12:00 Noon, October 3, 2008** 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:	Sixty (60) Calendar Days
LIQUIDATED DAMAGES:	**$500.00 per Calendar Day**
MINIMUM MBE GOALS:	Overall 25% Women owned businesses 4% African-American owned businesses 12%
BID DOCUMENTS:	**$25.00** - Bid documents can be purchased between 7:30 a.m. and 3:30 p.m., Mondays, Wednesdays, Thursdays and Fridays and between 10:00 a.m. and 4:00 p.m. on Tuesdays at the Ticket Office located at the Francis Scott Key Bridge, Maryland Transportation Authority, Administration Building, 303 Authority Drive, Baltimore, MD 21222.

This project is located at the William Preston Lane, Jr. Memorial Bridge Maintenance and Administration Buildings, 850 Revell Highway in Annapolis, Maryland.

The scope of work will include, but is not limited to:
-- Demolition and removal of existing roofing, metal flashings, gutters and other appurtenances.
-- Preparation of substrate and installation of new roofing and new metal flashing.

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 January 2001, 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. Don Watts at (410) 537-6651.

SP 1-4 - PROMPT PAYMENT TO SUBCONTRACTORS

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

This contract requires the Contractor to make payment to all Subcontractors within ten (10) days of receiving payment from the Maryland Transportation Authority ("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 Authority'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 Authority 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 Authority's Project Engineer when payment is made. After the Authority's Project Engineer verifies that payment has been made to the Subcontractor the Authority shall release withheld progress payments.

Nothing in this Special Provision shall be construed to prevent the Subcontractor from pursing 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 it 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 One Hundred Thousand Dollars ($100,000.00). 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 ($1,000,000.00) 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 ($500,000.00) 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 ($2,000,000.00) 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 for default or 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 ten (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 Authority 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 the Authority only when the Authority 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/offeror is unable to achieve the specified overall contract goal or subgoals for each certified MBE classification, the bidder/offeror must request, in writing, on Attachment A, (Certified MBE Utilization and Fair Solicitation Affidavit), a waiver at 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 109 of the Standard Specifications. Schedule must be cost loaded.

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 Subtitle 2, Title 7, of the Corporations and Associations Article of the 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 the Maryland Department of Assessments and Taxation website at 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 subcontractors 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 to 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 Contractor's 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. Requests 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 identification cards 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 it has investigated and satisfied itself 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; 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 it has satisfied itself 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 itself with the available information may not relieve it 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 its bid on forms he has generated in the development of its 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 point 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 (2) 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:

Mr. Benjamin Mondell
Chief of Engineering Procurement
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 have 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 RESPOND TO the provisions of GP 5.11 above, will result in the procurement officer immediately notifying the Contractor to comply with the required maintenance provisions. In the event that the Contractor fails to PROCEED WITH CORRECTIONS TO UNSATISFACTORY MAINTENANCE 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 RESPOND TO unsatisfactory maintenance 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

GP56 **DELETE:** GP-8.01 SUBCONTRACTING in its entirety.

INSERT: The following.

GP-8.01 SUBCONTRACTING

Except as may be provided elsewhere in the Contract, the Contractor to whom a Contract is awarded shall perform with his own organization and with the assistance of workmen under his immediate supervision, work of a value of not less than 50 percent of the total original value of the Contract.

No portion of the Contract shall be subcontracted, assigned or otherwise disposed of except with the written consent of the procurement officer. Any assignment, subcontract or other disposition of all or part of this Contract without the express written consent of the procurement officer shall be null and void. Consent to subcontract, assign or otherwise dispose of any portion of the Contract shall not be construed to relieve the Contractor or surety of any responsibility for the fulfilling of all the requirements of the Contract.

The Contractor shall incorporate by reference or otherwise include these General Provisions in every subcontract issued pursuant to or under this Contract, and shall require that the same reference or inclusion be contained in every subcontract entered into by any of its subcontractors.

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

GP70 **DELETE:** GP-9.01 SCOPE OF PAYMENT in its entirety.

INSERT: The following.

GP-9.01 SCOPE OF PAYMENT

Payment to the Contractor will be made for the actual quantities of Contract items performed in accordance with the Plans and Specifications and if, upon completion of the construction, these actual quantities show either an increase or decrease from the quantities given in the bid schedule, the Contract unit prices will still prevail, except as provided in GP-4.04 Variations in Estimated Quantities.

The payment of any partial estimate or of any retained percentage except by and under the approved final estimate and voucher, in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damages due to such defects.

When requested in writing by the Contractor and approved by the procurement officer, payment allowance will be made for nonperishable material to be incorporated in the work delivered and stockpiled at the work site or other approved site. Material for which payment has been made, wholly or partially, shall not be removed from the worksite or other approved site.

Payment to the Contractor under this section for materials on hand in no way will be construed as acceptance by the Administration of title to the material. Title shall remain with the Contractor until the project has been completed and accepted in accordance with GP-5.13.

The Contractor shall indicate his Federal Tax Identification or Social Security Number on the face of each invoice billed to the State.

On Contracts in excess of $25,000, the Contractor and any subcontractor with a lower tier subcontract, prior to receiving a progress or final payment under this Contract, shall first certify in writing that he has made payment from proceeds of prior payments, and that he will make timely payments, from the proceeds of the progress or final payment then due him, to his subcontractors and suppliers in accordance with his contractual arrangements with them.

The Contractor shall also obtain from each subcontractor a certification that it has made payment from proceeds of prior payments to any of its lower tier subcontractors, and will make timely payments to its lower tier subcontractors and suppliers in accordance with its contractual arrangements with them. This certification is not required from

subcontractors who have no lower tier subcontracts. These certifications may be required by the procurement officer for contracts of $25,000 or less.

In addition to any other remedies provided by law or this Contract, any Contractor or subcontractor of any tier who fails to make payments as required by the certifications set forth in the above paragraphs within thirty (30) days from the date such payment is due shall be obligated to include with such payment interest at the rate of 10 percent per annum from the date the payment was due to the date the payment was actually made to the subcontractor or lower tier subcontractor.

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 10 percent per annum beginning on the 31st day.

TERMS AND CONDITIONS
TC SECTION 1
REFERENCES AND DEFINITIONS

TC-1.01 REFERENCES.

1 **ADD**: As the third paragraph.

References to all specifications and procedures shall be understood to be the most recently published standard at the time of advertisement unless otherwise specified in the Contract Documents.

TC-1.02 DEFINITIONS.

5 **ADD**: After **Special Provisions.**

Special Provisions Inserts — Additions and revisions to the Standard Specifications that have not been officially approved as an Interim Specifications Addenda (ISA).

TERMS AND CONDITIONS

TC SECTION 2
BIDDING REQUIREMENTS AND CONDITIONS

87 **DELETE:** TC-2.01 PROJECT CLASSIFICATION in its entirety.

INSERT: The following.

TC-2.01 PROJECT CLASSIFICATION

The Administration will estimate the cost of the Contract and classify it within one cost group and letter designation as follows:

COST GROUP ESTIMATE	COST GROUP LETTER CLASS
Up to $ 100 000	A
$ 100 001 to $ 500 000	B
$ 500 001 to $ 1 000 000	C
$ 1 000 001 to $ 2 500 000	D
$ 2 500 001 to $ 5 000 000	E
$ 5 000 001 to $ 10 000 000	F
$ 10 000 001 to $ 15 000 000	G
$ 15 000 001 to $ 30 000 000	H
$ 30 000 001 to $ 50 000 000	I
$ 50 000 001 to $ 75 000 000	J
$ 75 000 001 to $ 100 000 000	K
Over $ 100 000 000	L

The letter designation will be published as part of the Notice to Contractors.

TERMS AND CONDITIONS
TC SECTION 3
SCOPE OF WORK

TC-3.01 GOVERNING ORDER OF CONTRACT DOCUMENTS.

11 **DELETE**: The first paragraph in its entirety.

INSERT: The following.

The Contract Documents, including but not limited to the Standard Specifications, the Interim Specifications Addenda, the Special Provisions Inserts, the Plans, Special Provisions, and all supplementary documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In the event of any discrepancy between the drawing and figures written thereon, the figures, unless obviously incorrect, will govern over scaled dimensions. In the event of any discrepancy between the various Contract Documents, the governing order from highest to lowest shall be Special Provisions, Plans, Special Provisions Inserts, Interim Specifications Addenda, and Standard Specifications.

TC-3.03 CONTINGENT ITEMS.

12 **DELETE**: In the second paragraph the last sentence "Neither party shall . . . of such items."

INSERT: The following.

The requirements of GP-4.04 (Variations in Estimated Quantities) and TC-7.07 (Eliminated Items) shall apply.

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 Jewel

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 One Million Dollars ($1,000,000.00) per occurrence/ Two Million Dollars ($2,000,000.00) 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 thirty (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.

TERMS AND CONDITIONS
TC SECTION 6
RESTRICTIONS AND PERMITS

26 **DELETE:** TC-6.10 RECYCLED OR REHANDLED MATERIALS in its entirety.

INSERT: The following.

TC-6.10 RECYCLED OR REHANDLED MATERIALS.

The Contractor shall submit to the Engineer, using MD SHA Form TC-6.09, the specific type and quantity of recycled materials (a) through (h) anticipated for use on the project prior to receipt of the Notice to Proceed. This submission does not preclude the normal materials process. Recycled materials shall conform to all applicable Specifications.

Typical recycled materials are:

(a) Crumb Rubber. Any rubber derived from processing whole scrap tires or shredded tire materials from automobiles, vehicles or other equipment owned and operated in the United States, provided the processing does not produce waste casings or other round tire material that can hold water when stored or disposed above ground. Rubber tire buffings produced by the retreading process qualify as a source of crumb rubber.

(b) Recycled Asphalt Pavement. Existing asphalt pavement milled or otherwise removed. Recycled in-place material is excluded.

(c) Glass. Waste glass crushed to be used as aggregate.

(d) Blast Furnace Slag. The nonmetallic by-product of iron production.

(e) Recycled Concrete Pavement. Existing concrete pavement crushed to be used as aggregate.

(f) Mining Waste Rock. The coarse material removed during the ore mining process.

(g) Coal Fly Ash. Fine material collected from the stack gases after coal combustion.

(h) Other. Any materials not listed above which are recycled as the original product or incorporated into other products.

For recycled or rehandled material furnished on the project by the Contractor for use in embankment, base, subbase or drainage media, the Engineer may require the Contractor to have the material tested and certified to be in conformance with all applicable environmental requirements. 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 and be based on the project environment. Testing and certification shall be at the Contractor's expense.

TC-6.11 CONSTRUCTION AND WASTE MATERIAL.

All wood, trash debris and other foreign matter shall be removed from the right-of-way and disposed of by the Contractor. The Contractor shall make all necessary arrangements to obtain suitable disposal locations and shall furnish the Engineer with a copy of resulting agreements. Disposal shall be in conformance with all Federal, State and local ordinances.

TC-6.12 STRUCTURE UNDERCLEARANCES AND OVERHEAD CLEARANCES

General. The requirements for underclearances at structures shall apply to the entire usable roadway areas including shoulders. Unless otherwise specified in the Contract Documents or directed by the Engineer, the Contractor shall ensure that the following underclearances are maintained.

(a) All bridges (except pedestrian bridges) over Interstate, United States, or State highways shall have a 16.0 ft minimum vertical underclearance.

(b) All bridges (except pedestrian bridges) over secondary/ county roads, and local roads and streets shall have a 14.5 ft minimum vertical underclearance.

(c) Pedestrian bridges shall have a minimum vertical underclearance 1 ft higher than those specified above. However, if there are bridges in the general vicinity of the proposed pedestrian bridge that have an underclearance greater than the minimum required underclearance of the pedestrian bridge, then the pedestrian bridge will have its underclearance increased to equal the highest overpass bridge.

(d) Removal of existing pavement under an existing pedestrian bridge to conform to the 1 ft higher requirement will not be required unless specified in the Contract Documents.

(e) All bridges with overhead structural elements (e.g. through truss bridges, movable bridges with overhead bracing for counterweights, etc.) shall have a 17.5 ft minimum overhead vertical clearance.

When the above requirements are not met, the Contractor shall take remedial actions as directed by the Engineer. When remedial actions are required, and there are no pay items for the work in the Contract Documents, the provisions of GP-4.06 (Changes) and GP-4.07 (Negotiated Payment Provisions) shall apply. The cost of measurements to determine clearance heights will be incidental to other pertinent items in the Contract Documents.

A minimum of 14.5 ft underclearance shall be maintained at all bridges throughout construction over each lane or shoulder open to traffic. No portion of formwork, temporary protective shields, etc. including connection devices shall encroach on this underclearance. If less than 16.0 ft vertical underclearance is provided on bridges specified in (a) or (d) above, the Engineer will notify the Director of Construction of the exact reduced minimum clearance and the effective dates of the reduction. The Contractor shall furnish and erect signs indicating the exact minimum underclearance. The signs and their locations shall be approved by the Engineer. Signs shall be removed and become the property of the Contractor when the intended underclearance is restored.

Resurfacing. These minimum underclearances shall be maintained whenever resurfacing a roadway. This may require grinding the existing pavement prior to placing the resurfacing material. Whenever highway overpass bridges are in the general vicinity of a pedestrian and grinding is not required to maintain the specified clearances, the roadway under the pedestrian bridge shall be ground to provide a higher underclearance than the adjacent bridges. This requirement will be waived whenever the Engineer contacts the Director of Construction and determines that the grinding would have an adverse effect on drainage, utilities, etc.

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 Director of Construction 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 ($25,000.00), 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 Director of Construction at least two weeks prior to the estimate cutoff date established by the Director of Construction. 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 Director of Engineering and verification by the Inspector that the material is stored at the approved location, the Director of Engineering 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 Director of Engineering and verification by the Inspector that the material is stored at the approved location, the Director of Engineering will authorize payment.

The Contractor shall pay the material provider the amount shown on the invoice within ten (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 percent 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.

CATEGORY 100
PRELIMINARY

SECTION 103 — ENGINEERS OFFICE

103.03 CONSTRUCTION.

143 **DELETE:** 103.03.06 Microcomputer System for all Offices in its entirety.

INSERT: The following.

103.03.06 Microcomputer System for all Offices.

(a) Desktop Unit.

(1) IBM compatible with an Intel or AMD processor.

(2) Minimum microprocessor speed of 3.0 GHz.

(3) Minimum hard drive storage of 80 GB (gigabyte).

(4) Minimum of 1 GB RAM (Random Access Memory).

(5) Enhanced 101 key keyboard with wrist rest.

(6) Super Video Graphics Accelerator (SVGA).

(7) Modem 56K BPS, ITU V.92 compliant – required for remote dial-in to the computer to provide MCMS system administration.

(8) Mouse with mouse pad.

(9) One CD-RW drive [re-writable CD-ROM].

(b) Operating System. Minimum Microsoft® Windows XP – all Microsoft Windows Critical Updates shall be installed prior to computer set up in the field office.

(c) Video Monitor. Color Super VGA monitor conforming to Energy Star requirements with a minimum screen size of 17 in.

(d) Printer. B&W Laser Jet Printer with a minimum resolution of 1200 DPI (dots per in.) and a minimum of 8 MB of RAM. Officejets and Bubblejets will not be accepted. Printer shall have a minimum print speed of 15 PPM (pages per minute).

(e) Software.

(1) Microsoft® Office XP Professional for Windows™ or later.

(2) Symantec® pcAnywhere32 for Windows™ version 10.5 or later.

(3) Antivirus software shall be installed and configured to perform an automatic update when the microcomputer system connects to the internet. Antivirus software approved for MDOT web email: *Norton, McAfee, Sophos, or ETrust.

(*Norton Internet Security includes both Antivirus and a Personal Firewall).

(f) Internet Access. The microcomputer system shall be provided with unlimited Internet service approved by the Engineer. Where available internet high-speed service [DSL or cable] must be provided. With DSL or cable internet service an external Router device and firewall software are required to protect the computer from security intrusions. With DSL a Dual Outlet Modular Adapter [single-line RJ11] will be required to connect the DSL modem and the 56k dial-up modem to the same line.

(g) Accessories.

(1) Uninterruptible power supply (UPS).

(2) Standard computer workstation with minimum desk space of 60 X 30 in. and a swivel type office chair, padded with arm rests.

(3) 8-1/2 X 11 in. xerographic paper to be supplied as needed.

(4) Toner or ink as needed for printer.

(5) Maintenance agreement to provide for possible down time.

(6) Physical security system to deter theft of computer components.

(7) Three 512MB USB Flash Drive storage devices.

(8) Blank recordable CD-R media for re-writable CD-ROM drive to be supplied as needed.

(h) Notes.

(1) The microcomputer system shall be completely set up ready for use on or before the day the Engineers office is to be occupied.

(2) All software stated above shall be supplied on original disks with manuals and be retained in the construction field office for the duration of the Contract.

(3) If for any reason the system fails to operate, the system shall be replaced or repaired within 48 hours.

When the microcomputer system is no longer required, the Construction Management software system including original user/operator guide manuals, program disks, and all data files (including those stored on external media: USB flash drives, CD-R's, ZIP disks, etc.) will be removed by the Engineer and delivered to the Director of Construction and become the property of the Administration. The remaining microcomputer system shall remain the property of the Contractor.

148 **ADD:** Specific Field The following after **103.03.08 Office Requirements**

103.03.09 Recyclable Materials (Paper, Bottles, Cans, Etc.). The Administration's Environmental Stewardship Plan includes recycling initiatives at the Administration's construction sites and encourages recycling of all suitable material at all Engineers Offices and Contractor's site facilities.

While recycling is encouraged at all sites, the Administration is requiring recycling at the Type D Engineers Office as well as the Contractors facilities at the location of the Type D Engineers Office. The Contractor shall provide the containers as well as arrange for the removal of the recycled material from the site. Recycling will not be measured but the cost will be incidental to the Type D Engineers Office.

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. 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 five 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 111 — DIGITAL CAMERA

111.01 DESCRIPTION. This work shall consist of furnishing a new or like new digital camera with a Color Inkjet Printer for use by Administration personnel. The digital camera 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.

111.02 MATERIALS.

(a) Digital Camera. The digital camera shall meet the following requirements and be furnished with the specified accessories.

(1) Windows 2000, ME, XP 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 (512 MB 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).

(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 5,000 pages/month.

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

111.03 CONSTRUCTION. Not applicable.

111.04 MEASUREMENT AND PAYMENT. The digital camera will not be measured but the cost will be incidental to the Contract price for Maintenance of Traffic unless otherwise specified in the Contract Documents. If the 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 eight hours after the Engineer notifies the Contractor.

Ownership of the camera 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 07600 of this Proposal Form includes the Technical Specifications for all work related to the Roof Replacement for the Maintenance and Administration Buildings at the William Preston Lane Jr. Memorial Bridge in Anne Arundel County, Maryland. 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 07600, 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 Roof Replacement for the Maintenance and Administration Buildings at the William Preston Lane Jr. Memorial Bridge.

MISCELLANEOUS CONTINGENCIES (ALLOWANCE)

PART 1 – GENERAL

A contingent allowance of Thirty Thousand Dollars **($30,000)** 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. 402)

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 project work included in this specification, on the Maintenance & Administration Buildings as necessary throughout the Authority complex as seen during the pre-bid and indicated on the roof 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, in the project drawings and the other Contract documents. Generally, the work will include:

1. Provide all labor, equipment, and materials to install the modified bitumen roof system over the properly prepared substrate.

2. Completely removing all existing roof coverings, including all membrane, membrane flashings, aggregate, insulation, etc., down to the existing substrates from all the roof areas being replaced.

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 nailer's 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. Properly cleaning, drying and repairing any damaged areas of the existing roof decks. All of these damaged areas will be inspected by the Authority and the roof system manufacture prior to the installation of the insulation and the cold modified roof system.

6. Tear off the existing roof system down to the existing substrate. Examine the existing substrate and perform repairs as necessary and directed by the Authority Engineer. Once the substrate has been approved by the Roof System Manufacture & the Authority Engineer the Contractor may proceed with the installation of the new roof system.

7. All metal surfaces will be cleaned properly prior to the installation of the insulation.

8. Placing all new wood nailers mechanically fastened to the roof deck, along all perimeter parapets and penetrations. (Only as necessary)

9. Placing all new ice and water shield under all metal components; coping cap, metal water table, metal fascia etc. (See drawings)

10. Install one (1) ply base sheet secured to the wood and lightweight concrete substrates per Factory Mutual I-90 minimum manufactures listings, standards and frequency. Manufacture shall approve surface prior to the application of the insulation.

11. One (1) course of 3.0 inch Polyisocyranurate insulation will be fully adhered and / or secured to the metal deck Per Factory Mutual I-90 manufactures listings. Once the insulation has been installed all joints shall be taped and inspected by the roof system manufacture. Complete with new tapered asphalt saturated fiberboard edge strips and cant around the perimeters and penetrations. ½ inch tapered crickets will be installed between all internal drains and scuppers throughout all roof sections being replaced.

12. Once the insulation is in place and all insulation joints taped; 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)

13. 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.

14. 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)

15. 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 must be met and manufactured by the modified cap sheet manufacture. (See Section 07550)

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 (5) 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 Authority Engineer (or Authority 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 the Authority/the Engineer rescheduling the pre-construction meeting, and the Contractor will be back-charged for all time/expenses incurred by the Authority/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 manufacturer, 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 the Authority.

D. The Authority Engineer hereby reserves 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 the Authority.

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. The Authority 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 (3) 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 the Authority. The Contractor must submit their proposed Manufacturer for the new roof covering system to the Authority (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 the Authority (via the Engineer) for approval, prior to the Authority 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 the Authority, 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 to the Authority (via the Engineer), in accordance with COMAR requirements.

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 Authority Engineer.

G. The Contractor and all Subcontractors must submit a bona fide Certificate of Liability Insurance coverage to the Authority, via the Engineer. The Insurance Certificate must guarantee insurance coverage for the minimum dollar amounts as indicated in the Maryland Transportation Authority bid/contract documents.

1. The Contractor's (and all Subcontractors') Insurance Certificates must specifically name the Maryland Transportation Authority, as additional insured.

2. The Authority must receive written notice (via the Engineer) of any modification or cancellation of the Contractor's (or Subcontractor's) insurance policy(ies), at least thirty (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 the Authority, 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 Authority 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 five (5) calendar days after the Contractor's receipt of Notice to Proceed from the Authority.

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 the Authority.

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 the Authority for approval, prior to the Authority's 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 the

Authority. 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 the Authority.

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 the Authority.

C. Prior to submitting the final payment requisition, the Contractor is to confirm in writing to the Authority 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 Authority Engineer.

C. The Contractor is to provide a signed, written report of daily progress, personnel on-site, and deliveries received, if requested by the Authority 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 the Authority regarding location of vehicles, staging areas, equipment, stored materials, bitumen handling, etc.; be 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 the Authority, 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 the Authority is completed. The Authority 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 the Authority, 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 (i.e. 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 the Authority 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 Authority 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 Authority 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 Authority 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 Authority Project Manager.

1.03 DEFINITIONS

Informational Submittals: Written information that does not require Engineer or the Authority 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 Authority 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 the need to review submittals concurrently for coordination.

a. The 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 CPM Schedule for list of 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 the name of the 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; and

    k. Other necessary identification.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. The Authority 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; and

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 the Authority Project Manager seven copies of each submittal, unless otherwise indicated. The Authority 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 the Authority Project Manager seven (7) copies of each submittal, unless otherwise indicated. The Authority Project Manager will return four (4) copies. Mark up and retain one (1) returned copy as 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. Attach label on unexposed side that includes the following:

a. Generic description of Sample;

b. Product name or name of manufacturer; and

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.

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 07220 - Roof and Deck Insulation

B. Section 07550 - Modified Bitumen Roof Membrane

C. 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: Proper type, size, material and finish for each applications.

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.

3.03 Installation

A. Provide nailers, blocking and sleepers where shown on the drawings or required for attachment of other work. Coordinate with location with other work involved; refer to shop drawings of such 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 thigh connections prior to closing in or at completion of work.

H. Install torchable cant strips at vertical intersections and at all penetrations.

END OF SECTION 06100

SECTION 07220 ROOF DECK AND INSULATION

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. Provide all labor, equipment, and materials to install roof insulation over the properly prepared deck substrate.

Insulation will be a minimum 3 inch Polyisocyranurate insulation adhered to the underlying base sheet per Factory Mutual I-90 manufacturer's listings meeting the minimum frequency and pattern. All insulation joints shall be taped and inspected by the roof system manufacturer prior to the application of the cold applied roof system. All FM requirements must follow the requirements set forth in the FM I-90 listings and meeet or exceed the 4470 minimum standard. All internal drains and existing scuppers will have ½ inch tapered crickets installed with specified insualtion.

B. All nailable decks will have a base sheet secured per Factory Mutual I-90 minimum standards and frequency with the insulation fully adhered with insulation adhesive.

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 07550 - Modified Bitumen Roofing
2. Section 07600 - Flashing and Sheet Metal
3. Section 06100 - Rough Carpentry

1.3 REFERENCES

ASTM A-167-94a	Specification for Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet and Strip
ASTM A-653	Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process
ASTM B-29	Pig Lead
ASTM B-32	Solder Metal
ASTM C-165-95	Test Method for Measuring Compressive Properties of Thermal Insulation

ASTM C-208-95	Specifications for Cellulosic Fiber Insulating Board
ASTM C-209-92	Test Method for Cellulosic Fiber Insulating Board
ASTM C-272-91	Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions
ASTM C-36	Specification for Gypsum Wallboard
ASTM C-518-91	Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM C-578-92	Specification for Rigid, Cellular, Polystyrene Thermal Insulation
ASTM C-728-91	Specification for Perlite Thermal Insulation Board
ASTM D-5	Test Method for Penetration of Bituminous Materials
ASTM D-36	Test Method for Softening Point of Bitumen (Ring and Ball Apparatus)
ASTM D-312	Specification for Asphalt Used in Roofing
ASTM D-412-92	Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension
ASTM D-1621-94	Test Method for Compressive Properties of Rigid Cellular Plastics
ASTM D-1622	Test Method for Apparent Density of Rigid Cellular Plastics
ASTM D-1863	Specification for Mineral Aggregate Used on Built-Up Roofs
ASTM D-2126-94	Test Method for Response off Rigid Cellular Plastics to Thermal Humid Aging
ASTM D-2178	Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing
ASTM D-4601-94	Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing
ASTM D-5147	Sampling and Testing Modified Bituminous Sheet Material
CISPI	Cast Iron Soil Pipe Institute, Washington, D.C.
FM	Factory Mutual System, Norwood, Massachusetts
NRCA	National Roofing Contractors Association, Chicago, IL
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SDI	Steel Deck Institute, St. Louis, Missouri
SPIB	Southern Pine Inspection Bureau, Pensacola, Florida
UL	Underwriter's Laboratories, Inc., Northbrook, Illinois
FS HH-I-1972	Insulation Board, Polyisocyanurate
FS LLL-1-535B	Insulation Board, Thermal (Fiberboard)
WH	Warnock Hersey International, Inc., Middletown, Wisconsin

1.4 SUBMITTALS

A. Submit under provisions of Section 07220 & General Submittal requirements.

B. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Section 07220.

C. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.

D. Provide a sample of each insulation type.

E. Shop Drawings

1. Submit manufacturer's shop drawings indicating complete installation details of tapered insulation system, including identification of each insulation block, sequence of installation, layout, drain locations, roof slopes, thicknesses, crickets and saddles.

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

F. Certification

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

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

3. Submit certification that insulation and fastening system furnished is Tested and Approved by Factory Mutual for 1-90 Wind Up-Lift Requirements.

1.5 QUALITY ASSURANCE

A. Fire Classification, ASTM E-108

B. Submit certification that the roof system furnished is approved by Factory Mutual, Underwriters Laboratories or Warnock Hersey for external Fire E-108 Class 1A and that the roof system is adhered properly to meet or exceed 1-90 listings.

C. Submit certification that the roof system furnished meets local or nationally recognized building codes for fire Class A and/or wind resistance.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.

C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).

D. Store materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

Provide thicknesses of insulation as indicated, provide combination of types and thicknesses to provide a complete system.

RIGID POLYISOCYANURATE ROOF INSULATION

a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.

1. Thickness: 3 in.
2. R-Value: 18.5

b. Source
1. Hunter
2. Firestone
3. GAF
4. Approved Equivalent

c. Insulation board shall meet the following requirements
1. FM listed under Roofing Systems
2. Federal Specification HH-I-1972, Class 1

d. Physical Properties:

Dimensional Stability	ASTM D-2126	2% max.
Compressive Strength	ASTM D-1621	25 psi min.

Vapor Permeability	ASTM E-96	1 perm max.
Foam Core Density	ASTM D-1622	2.0 pcf min.
Water Absorption	ASTM C-209	<1%
R-Factor HR per inch Thickness	ASTM C-518	3.0

2.2 RELATED MATERIALS

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

Acceptable Insulation Manufacturers
a. The Garland Company, Inc.
b. GAF
c. Firestone
d. Hunter
e. Approved Equivalent

B. Protection Board: Premolded semi-rigid asphalt composition board ½ in.

C. Roof Board Joint Tape: 6" wide glass fiber mat with adhesive compatible with insulation board facers.

D. Type III Asphalt.

E. Metal Deck Foam Adhesive: Type recommended by insulation manufacturer and approved by FM and UL for indicated listings.

PART 3 - EXECUTION

Adhere flat and tapered polyisocyranurate insulation per Factory Mutual I-90 minimum frequency and pattern. Pattern and coverage shall be recommended by the roof system manufacturer meeting the appropiate adhesion standards.

3.1 INSPECTION OF SURFACES

Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.

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

3.2 INSTALLATION

A. Attachment with Insulation Foam Adhesive

1. All insulation will be installed and adhereed to the underlying base sheet that is secured to the substrate per Factory Mutual I-90 minimum standards and manufacturer's listings. All insulation boards will be adhered using ribbons of insulation adhesive at a rate to achieve Factory Mutual I-90 minimum frequency and manufacturer's listings.

2. Mixing, dispensing and application of approved adhesive shall be according to manufacturer's specifications. When applying adhesive place the insulation boards onto the adhesive beads within 3 minutes and walk on the boards immediately to spread the beads for maximum contact. Continue to walk on the insulation boards every 5-7 minutes until the insulation is firmly attached (usually 20-45 minutes).

3. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of ¼" away from the vertical surface. All joints shall be tapped prior to the insulation of the waterproofing membrane.

3.3 CLEANING

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

END OF SECTION

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 07220 - Roof and Deck Insulation
2. Section 07600 - Flashing and Sheet Metal
3. 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 manufacturer's 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 a 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 of 5 years experience and who is certified by the roofing system manufacturer as qualified to install manufacturer's 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 a minimum of 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.

E. It shall be the Contractor's 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, 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 are to meet at the 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).

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 the 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 its expense.

1.7 MANUFACTURER'S INSPECTIONS

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 the 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 twenty-five (25) year warranty. This comprehensive warranty shall cover all metal components and entire roof system installed for the length of the entire warranty period.

B. Contractor will submit a minimum of a (5) five-year warranty to the membrane manufacturer with a copy directly to Owner.

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 Authority 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

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

A. Asphalt Primer: V.O.C. compliant, ASTM D-41.

B. Asphalt Roofing Mastic: V.O.C. compliant, ASTM D-2822, Type II.

C. 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 1	00°F min.
6. Slope	½:12 - 2:12	

D. 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%

E. 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. 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

1. 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 310lbf/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 Isporene Styrene and Ethylene Styrene) must meet the following criteria:

1. Must have been manufacturing modified cap sheets for a period not less than twenty-five (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 manufacturer must provide a thirty (30) 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 manufacturer 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.

E. 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 manufacturer's 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 manufacturer 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 by 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 membrane 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" beyond top edge of all cants in full moppings of the cold adhesive as shown on the drawings.

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.

3.5 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 manufacturer)

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.

3.6 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.

3.7 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 its 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.

END OF SECTION

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 07220 – Roof Deck and Insulation
3. 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, terminations, 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.

G. Manufacturer's Product Data

1. Metal material characteristics and installation recommendations.

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

1.5 QUALITY 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 manufacturer.

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 (5) 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.

1.6 QUALIFICATIONS

Fabricator and Installer: Company specializing in sheet metal flashing work with five (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 HOO (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.

END OF SECTION