

SCOPE OF WORK

Trenton Office Complex Roof Restoration

MVC Central Headquarters Building
225 East State Street
Trenton, Mercer, NJ

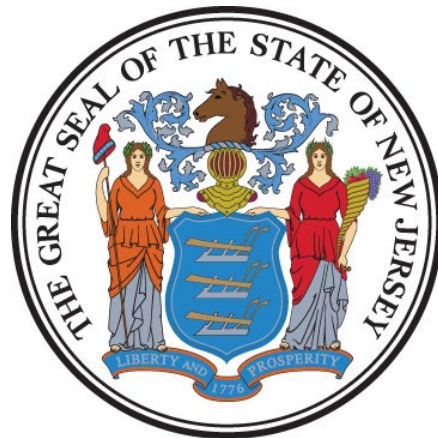
Project No. A1382-00

STATE OF NEW JERSEY

Honorable Philip D. Murphy, Governor
Honorable Tahesha L. Way, Lt. Governor

DEPARTMENT OF THE TREASURY

Elizabeth Maher Muoio, Treasurer



DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION

Christopher Chianese, Director

Date: December 7, 2023

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I. OBJECTIVE

The objective of this project is to repair and replace sections of the Trenton Office Complex (MVC Building) roof. See **Exhibit 'B'** for the project site location map.

II. CONSULTANT QUALIFICATIONS

A. CONSULTANT & SUB-CONSULTANT PRE-QUALIFICATIONS

The Consultant shall be a firm pre-qualified with the Division of Property Management & Construction (DPMC) in the following discipline(s):

- **P035 Roofing Consultant**

The Consultant shall also have in-house capabilities or Sub-Consultants pre-qualified with DPMC in:

- **P007 Structural Engineering**
- **P025 Estimating/Cost Analysis**
- **P028 Roof Inspection**
- **P037 Asbestos Design**
- **P038 Asbestos Safety Control Monitoring**
- **P065 Lead Paint Evaluation**

As well as, **any and all** other Architectural, Engineering and Specialty Disciplines necessary to complete the project as described in this Scope of Work (SOW).

III. PROJECT BUDGET

A. CONSTRUCTION COST ESTIMATE (CCE)

The initial Construction Cost Estimate (CCE) for this project is \$3,000,000.

The Consultant shall review this Scope of Work and provide a narrative evaluation and analysis of the accuracy of the proposed project CCE in its technical proposal based on its professional experience and opinion.

B. CURRENT WORKING ESTIMATE (CWE)

The Current Working Estimate (CWE) for this project is \$3,964,800.

The CWE includes the construction cost estimate and all consulting, permitting and administrative fees.

The CWE is the client agency's financial budget based on this project Scope of Work and shall not be exceeded during the design and construction phases of the project unless DPMC approves the change in Scope of Work through a Contract amendment.

C. CONSULTANT'S FEES

The construction cost estimate for this project *shall not* be used as a basis for the Consultant's design and construction administration fees. The Consultant's fees shall be based on the information contained in this Scope of Work document and the observations made and/or the additional information received during the pre-proposal meeting.

IV. PROJECT SCHEDULE

A. SCOPE OF WORK DESIGN & CONSTRUCTION SCHEDULE

The following schedule identifies the estimated design and construction phases for this project and the estimated durations.

PROJECT PHASE	ESTIMATED DURATION (Calendar Days)
1. Site Access Approvals & Schedule Design Kick-off Meeting	14
2. Design Development Phase	42
• <i>Project Team & DPMC Plan/Code Unit Review & Comment</i>	14
3. Final Design Phase	42
• <i>Project Team & DPMC Plan/Code Unit Review & Approval</i>	14
4. Final Design Re-Submission to Address Comments	7
• <i>Project Team & DPMC Plan/Code Unit Review & Approval</i>	14
5. DCA Submission Plan Review	30
6. Permit Application Phase	7
• <i>Issue Plan Release</i>	

7. Bid Phase	42
8. Award Phase	28
9. Construction Phase	180
10. Project Close Out Phase	30

B. CONSULTANT’S PROPOSED DESIGN & CONSTRUCTION SCHEDULE

The Consultant shall submit a project design and construction schedule with its technical proposal that is similar in format and detail to the schedule depicted in **Exhibit ‘A’**. The schedule developed by the Consultant shall reflect its recommended project phases, phase activities, activity durations.

A written narrative shall also be included with the technical proposal explaining the schedule submitted and the reasons why and how it can be completed in the time frame proposed by the Consultant.

This schedule and narrative will be reviewed by the Consultant Selection Committee as part of the evaluation process and will be assigned a score commensurate with clarity and comprehensiveness of the submission.

V. PROJECT SITE LOCATION & TEAM MEMBERS

A. PROJECT SITE ADDRESS

The location of the project site is:

MVC Center Headquarters Building
225 East State Street
Trenton, NJ

See **Exhibit ‘B’** for the project site location map.

B. PROJECT TEAM MEMBER DIRECTORY

The following are the names, addresses, and phone numbers of the Project Team members.

1. DPMC Representative:

Name: Nurul Hasan, Project Manager
Address: Division of Property Management & Construction
20 West State Street, 3rd Floor
Trenton, NJ 08608-1206
Phone No: (609) 633-8265
E-Mail No: nurul.hasan@treas.nj.gov

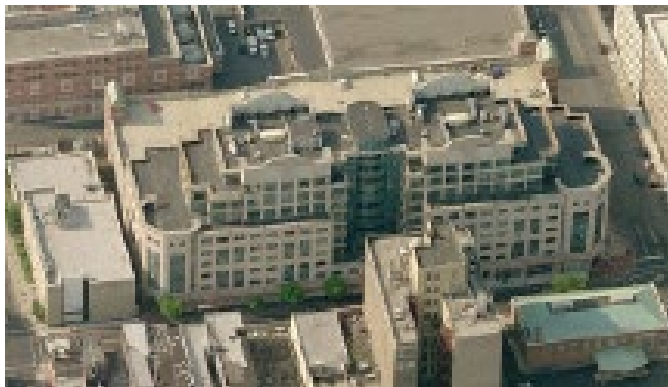
2. DPMC Representative:

Name: Mark Dae, Chief, Property Management
Address: Division Property Management & Construction
20 West State Street, 3rd Floor
Trenton, NJ 08608-1206
Phone No: (609) 984-9711
E-Mail No: Mark.Dae@treas.nj.gov

VI. PROJECT DEFINITION

A. BACKGROUND

The Department of Motor Vehicles Building is a nine story structure located at the southwest corner of East State Street and South Montgomery in Trenton, NJ. The building was designed by Rotherl Johnson Associates in 1990.



Aerial View

B. FUNCTIONAL DESCRIPTION OF THE BUILDING

The existing roof systems have exceeded their life expectancy. Several attempts to patch the current leaks have been unsuccessful. Section D in the (9) ninth floor has been completed under project A1347-00.

The Motor Vehicle Commission roof has been divided into twenty-five (25) roof areas. Each roof area has been lettered, which is indicated on the enclosed roof plans. A pictorially illustrated report on existing conditions is included. See **Exhibit 'D' Roof Evaluation Report MVC Trenton, NJ. Prepared by ARMM Associates, Inc. Dated September 2018.**

There is approximately 53,034 square feet of a roofing system, including the lower and upper flat roofs on the MVC Building.

EPDM Roof Area = 53,034 sq. ft.
Standing Seam Metal Roof Area = 694 sq. ft.
Skylight Area = 1,871 sq. ft.

VII. CONSULTANT DESIGN RESPONSIBILITIES

A. NEW ROOF DESIGN REQUIREMENTS

The Consultant shall provide the Design, Construction Administration, Permitting and Bid/Award services to repair and replace sections of the Trenton Office Complex (MVC Building) roof.

1. Roof System Removal:

The existing roof system, insulation, flashings, and related trims shall be completely removed to the original decking and legally disposed. The removal of the existing roof system shall be coordinated with the installation of the new roof to prevent exposure to weather conditions and potential water infiltration into the building.

Design documents shall identify all requirements for safety devices, dumpster location, chutes or other methods of roofing material removal, protection from exposure to the weather, protection of property and personnel, building access routes and circulation patterns, contractor use of the premises, parking, security procedures, equipment and materials storage, waste disposal, etc.

2. Caulking & Joint Sealants:

All appropriate roof deck joint sealants shall be removed and replaced with high performance sealant as part of the roof system. The design shall include the cleaning, priming, and installation of new sealants with new backer rods and bond breakers.

Examine and measure all exterior joints and calculate the required joint width(s). Design for widening joints as required.

Observe the installation of the sealant joints, performing pull tests for cohesion and adhesion on a random sampling of each joint type.

Specify that the sealant manufacturer must provide a warranty for a minimum of twenty (20) years for any repairs to maintain joints in a leak free condition and at no cost to the State.

3. Insulation:

Provide new high-density rigid insulation boards that comply with current energy code requirements. Ensure the roofing system manufacturer approves the method of fastening the insulation board to the roof deck system.

Flat roofs shall be avoided by using tapered insulation to promote positive drainage to the roof drains. Incorporate a roof design that shall slope a minimum of ¼" per foot (½" per foot preferred).

DPMC does not permit Urethane material insulation due to a history of gas release and bubbling under the roofing ply layer(s).

4. New Roofing System Criteria:

Provide the design for the new roofing system in accordance with the requirements of the roofing manufacturer.

The manufacturer of the roofing system shall have no less than five (5) years successful experience in producing the materials required for this project. Membrane, flashing, and adhesive shall be the single product of a standard manufacturer.

The roofing system shall be in accordance with the latest ASHRAE 90.1 (Adopted Edition) energy standards.

The roofing system shall be in compliance with the "Factory Mutual Research Corp" (FMRC) standards and must meet all requirements of Factory Mutual I-90 classification for wind uplift.

The Contractor shall supply only a U.L. Class “A” fire rated roofing system.

If the roofing system and/or related components are not a replacement in kind, then the Consultant shall submit a signed and sealed calculations to the DPMC Design and Code Review Unit Manager verifying that the existing roof structure can support all loads of the new roofing system and components per current code requirements.

5. Flashing:

All rooftop HVAC curbing, parapet walls, conduit, pipe supports, pipe vents, roof hatch, ventilation fans, and other roof penetrations must have new flashing installed as part of this project.

All pipe flashings are to be pre-molded and provided with stainless steel pipe clamps at each penetration.

6. Parapet Walls & Coping:

Provide a design to repair or replace any damaged coping on the parapet walls as part of this project including design details to seal the coping joints.

7. Skylights:

Provide a design for the repair skylights.

8. Walkways:

As applicable, provide new walkway protection from access points to and around all roof mounted HVAC units and/or other similar equipment requiring periodic servicing and any other trafficking areas. If existing walk pads are to be reused then verify that they are compatible with the new roofing system.

9. Roof Drains:

All drains shall be removed and reset or repositioned so that the drain is below the roof membrane surface. Provide for the interior cleaning, repair, replacement and additional drains as required and ensure that drainage water will be carried away from the building foundations, footings, lanes and sidewalks. Investigate the abandonment of leaking interior drain lines and the installation of new interior lines where access is impossible for repairs and/or replacement. Piping from HVAC units should properly discharge into drains.

Provide additional roof drains where required to eliminate standing or ponding water. New interior roof drain piping shall be designed to avoid interference with existing ductwork,

structural members, and miscellaneous piping, electrical conduit, hangers, etc. The design documents shall include detailed information that describes the methods required to protect the furniture, equipment, and interior building finishes.

10. Night Seals:

Specify in the design documents that only as much roofing insulation, membrane, and flashing as can be made weather tight shall be installed each day. Install temporary water tight night seals around all exposed edges of the roofing assembly at the end of each work day and when work must be postponed due to inclement weather.

11. Fire Protection Program:

Address fire protection requirements during the demolition and installation of the roofing system. Language shall be included that states open flames such as propane torches, kettles, flame cutting, and welding cannot be used on the construction site until a fire watch program has been submitted by the Contractor and approved by the Consultant and Project Team members.

12. Allowable Roof System Installation:

The design documents shall specify the weather and temperature installation restrictions based on the roof system manufacturer’s recommendations.

13. Warranty:

The roofing manufacturer’s warranty shall be for a period of twenty (20) years.

14. Unit Prices:

If the total amount or quantity of repair work cannot be determined for a roof related item by the roof inspection process, then the Consultant shall include a “Unit Price” Section in Division 1 of the specification for that item. Items may include deteriorated concrete or metal decking, plywood sheathing, wood blocking or curbing, vapor barriers, interior roof drains, etc.

B. STRUCTURAL INVESTIGATION ALLOWANCE

If materials have to be stored on the structure, the Consultant shall estimate the cost to provide structural calculations indicating maximum loading criteria, and provide Design, Construction Administration, Permitting and Bid/Award services to repair the roof structural components as necessary and include that amount in their fee proposal line item entitled “**Structural Investigation Allowance**”.

C. HAZARDOUS BUILDING MATERIALS

Consultant shall survey the building(s) and, if deemed necessary, collect samples of materials that will be impacted by the construction/demolition activities and analyze them for the presence of hazardous materials including:

1. Asbestos in accordance with N.J.A.C. 5:23-8, Asbestos Hazard Abatement Sub code.
2. Lead in accordance with N.J.A.C. 5:17, Lead Hazard Evaluation and Abatement Code.
3. PCB's in accordance with 40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions. Consultant shall engage a firm certified in the testing and analysis of materials containing PCB's.
4. Mold

The Consultant shall engage the services of a Sub-Consultant, pre-qualified with DPMC in the P065 Lead Paint Evaluation/Inspection Specialty Discipline to produce a design document that stipulates construction safety procedures that adhere to applicable Federal and State regulations and that shall be incorporated into the project design documents.

A formal lead abatement shall not be conducted. Rather, the design document shall deal only with proposed lead base paint as may be encountered in areas of the building that will be affected by the construction of this project. It is intended that the construction Contractor for the project shall be responsible for any and all air or swab sampling during construction as may be required by law. The Sub-Consultant shall supervise said activity and sampling.

Consultant shall document their procedure, process and findings and prepare a "Hazardous Materials Survey Report" identifying building components impacted by construction activities requiring hazardous materials abatement. Consultant shall provide three copies of the "Hazardous Materials Survey Report" to the Project Manager.

Consultant shall estimate the cost of hazardous materials sample collection, testing, analysis and preparation of the Hazardous Materials Survey Report and include that amount in their fee proposal line item entitled "**Hazardous Materials Testing and Report Allowance**", refer to paragraph X.B.

Based on the Hazardous Materials Survey Report, Consultant shall provide construction documents for abatement of the hazardous materials impacted by the work in accordance with the applicable code, sub code and Federal regulations.

Consultant shall estimate the cost to prepare construction documents for hazardous materials abatement and include that amount in their fee proposal line item entitled “**Hazardous Materials Abatement Design Allowance**”, refer to paragraph X.C.

Consultant shall estimate the cost to provide “Construction Monitoring and Administration Services” for hazardous materials abatement activities and include that amount in their fee proposal line item entitled “**Hazardous Materials Construction Administration Allowance**”, refer to paragraph X.D.

There shall be no “mark-up” of sub-consultant or subcontractor fees if sub-consultants or subcontractors are engaged to perform any of the work defined in paragraph VII.B “Hazardous Building Materials”. All costs associated with managing, coordinating, observing and administrating sub-consultants and subcontractors performing hazardous materials sampling, testing, analysis, report preparation, hazardous materials construction administration services shall be included in the consultant’s lump sum fee proposal.

D. ROOF MONITOR

The Consultant shall have in-house capabilities or a Sub-Consultant pre-qualified with DPMC in the P028 Roofing Inspection Specialty Discipline. The costs for the services provided by the roof monitor shall be included in their fee proposal line item entitled “**Roof Monitor Allowance**”, refer to paragraph X.E. A cost breakdown sheet shall accompany the fee proposal that identifies all costs associated with the Roof Monitoring services to be provided.

The Consultant shall provide a full time roof monitor during the installation of the roof systems on the buildings. The responsibilities of the roof monitor shall include, but not be limited to the following items:

1. Roof Monitor Inspections:

The Roof Monitor must continuously inspect and monitor the Contractor’s work on site and file a daily DPMC 605 Roofing Inspector’s Check List Form to ensure compliance with the contract documents. Photographs shall be included for reference. The report shall include weather conditions, number of workers, and the amount of roof removed and installed together with comments on each phase of work. Comments shall provide descriptions and information on project mobilization, material delivery, removal of existing roof system, preparation of the existing deck, installation of the new underlayment and/or insulation, sealant and adhesive applications, flashing, walkways, etc.

2. Inclement Weather:

The Consultant, in conjunction with the Roof Monitor, shall anticipate time losses due to seasonal inclement weather conditions such as rain, wind and low ambient temperatures and include these hours in the base bid of the fee proposal.

On the first day of inclement weather, the Roof Monitor will be entitled to four hours to visit the site and inspect the roofing system for potential roof leaks or damage. Additional time spent on the site during inclement weather will not be reimbursed unless directed by the Project Manager.

3. Unsatisfactory Work:

If the Roof Monitor determines that the roof Contractor is installing the roofing system improperly, he shall notify the Contractor to stop all work until the Consultant is notified and inspects the work for design conformity. If appropriate, provisions shall be made to seal the roof work area until the Consultant arrives and the installation issues are resolved.

If the Consultant determines that the installation does not meet the intentions of the design or indicates poor workmanship, he shall notify the Project Manager that he recommends the questionable roofing installation be removed and replaced properly. The Project Manager shall then notify the Contractor verbally to take the recommended action and shall follow up with a written directive indicating the time and date the Contractor was notified.

4. Meetings:

The Consultant and Roof Monitor shall both attend the pre-construction conference and all periodic job progress meetings during the construction phase of the project.

E. EMERGENCY REPAIRS

The Consultant must include information in the contract documents that will address the Contractor's responsibility for repairs to the roofing system during the construction phase of the project. The information shall include, but not be limited to the following:

Stipulate in the contract documents that the Contractor shall perform all inspections and emergency repairs to all defects or leaks in the roofing system during construction within twenty four (24) hours of receipt of notice from the owner. Repairs shall include all labor, roofing materials, flashing, etc. When weather permits, all temporary repairs shall be redone and the roof restored to the standard of the original installation.

F. DESIGN MEETINGS & PRESENTATIONS

1. Design Meetings:

Conduct the appropriate number of review meetings with the Project Team members during each design phase of the project so they may determine if the project meets their requirements, question any aspect of the contract deliverables, and make changes where appropriate. The Consultant shall describe the philosophy and process used in the development of the design criteria and the various alternatives considered to meet the project objectives. Selected studies, sketches, cost estimates, schedules, and other relevant information shall be presented to support the design solutions proposed. Special considerations shall also be addressed such as: Contractor site access limitations, utility shutdowns and switchover coordination, phased construction and schedule requirements, security restrictions, available swing space, material and equipment delivery dates, etc.

It shall also be the responsibility of the Consultant to arrange and require all critical Sub-Consultants to be in attendance at the design review meetings.

Record the minutes of each design meeting and distribute within three (3) calendar days to all attendees and those persons specified to be on the distribution list by the Project Manager.

2. Design Presentations:

The minimum number of design presentations required for each phase of this project is identified below for reference:

Design Development Phase: One (1) oral presentation at phase completion.

Final Design Phase: One (1) oral presentation at phase completion.

G. EXISTING DOCUMENTATION

Copies of the following documents will be provided to each Consulting firm at the pre-proposal meeting to assist in the bidding process.

- T0436-00 MVC Administration (TOC) Building Roof Replacement, March 2006, STV Architects Inc.

Review these documents and any additional information that may be provided at a later date such as reports, studies, surveys, equipment manuals, as-built drawings, etc. The State does not attest to the accuracy of the information provided and accepts no responsibility for the consequences of errors by the use of any information and material contained in the documentation provided. It

shall be the responsibility of the Consultant to verify the contents and assume full responsibility for any determination or conclusion drawn from the material used. If the information provided is insufficient, the Consultant shall take the appropriate actions necessary to obtain the additional information required.

All original documentation shall be returned to the provider at the completion of the project.

VIII. PERMITS & APPROVALS

A. NJ UNIFORM CONSTRUCTION CODE PLAN REVIEW AND PERMIT

The project construction documents must comply with the latest adopted edition of the NJ Uniform Construction Code (NJUCC).

The latest NJUCC Adopted Codes and Standards can be found at:

<http://www.state.nj.us/dca/divisions/codes/codreg/>

1. NJ Uniform Construction Code (NJUCC) Plan Review

Consultant shall estimate the cost of the NJUCC Plan Review by DCA and include that amount in their fee proposal line item entitled “**Plan Review and Permit Fee Allowance**”, refer to paragraph X.A.

Upon approval of the Final Design Phase Submission by DPMC, the Consultant shall submit the construction documents to the Department of Community Affairs (DCA), Bureau of Construction Project Review to secure a complete plan release.

As of July 25, 2022, the Department of Community Affairs (DCA) is only accepting digital signatures and seals issued from a third party certificate authority. The DCA ePlans site can be found at:

<https://www.nj.gov/dca/divisions/codes/offices/ePlans.html>

Procedures for submission to the DCA Plan Review Unit can be found at:

https://www.state.nj.us/dca/divisions/codes/forms/pdf_bcpr/pr_app_guide.pdf

Consultant shall complete the “Project Review Application” and include the following on Block 5 as the “Owner’s Designated Agent Name”:

Joyce Spitale, DPMC
PO Box 235
Trenton, NJ 08625-0235
Joyce.Spitale@treas.nj.gov 609-943-5193

The Consultant shall complete the NJUCC “Plan Review Fee Schedule”, determine the fee due and pay the NJUCC Plan Review fees, refer to Paragraph X.A.

The NJUCC “Plan Review Fee Schedule” can be found at:

http://www.state.nj.us/dca/divisions/codes/forms/pdf_bcpr/pr_fees.pdf

2. NJ Uniform Construction Code Permit

Upon receipt of a complete plan release from the DCA Bureau of Construction Project Review, the Consultant shall complete the NJUCC permit application and all applicable technical sub-code sections. The “Agent Section” of the application and certification section of the building sub-code section shall be signed. These documents, with **six (6) sets of DCA approved, signed and sealed construction documents** shall be forwarded to the DPMC Project Manager.

The Consultant may obtain copies of all NJUCC permit applications at the following website:

<http://www.state.nj.us/dca/divisions/codes/forms/>

All other required project permits shall be obtained and paid for by the Consultant in accordance with the procedures described in Paragraph VIII.B.

3. Prior Approval Certification Letters:

The issuance of a construction permit for this project may be contingent upon acquiring various “prior approvals” as defined by N.J.A.C. 5:23-1.4. It is the Consultant’s responsibility to determine which prior approvals, if any, are required. The Consultant shall submit a general certification letter to the DPMC Plan & Code Review Unit Manager during the Permit Phase of this project that certifies all required prior approvals have been obtained.

In addition to the general certification letter discussed above, the following specific prior approval certification letters, where applicable, shall be submitted by the Consultant to the DPMC Plan & Code Review Unit Manager: Soil Erosion & Sediment Control, Water & Sewer Treatment Works Approval, Coastal Areas Facilities Review, Compliance of Underground Storage Tank Systems with N.J.A.C. 7:14B, Pinelands Commission, Highlands Council, Well Construction and Maintenance; Sealing of Abandoned Wells with N.J.A.C. 7:9D, Certification that all utilities have been disconnected from structures to be demolished, Board of Health Approval for Potable Water Wells, Health Department Approval for Septic Systems. It shall be noted that in accordance with N.J.A.C. 5:23-2.15(a)5, a permit cannot be issued until the letter(s) of certification is received.

4. Multi-building or Multi-site Permits:

A project that involves many buildings and/or sites requires that a separate permit shall be issued for each building or site. The Consultant must determine the construction cost estimate for *each* building and/or site location and submit that amount where indicated on the permit application.

5. Special Inspections:

In accordance with the requirements of the New Jersey Uniform Construction Code N.J.A.C. 5:23-2.20(b), Bulletin 03-5 and Chapter 17 of the International Building Code, the Consultant shall be responsible for the coordination of all special inspections during the construction phase of the project.

Bulletin 03-5 can be found at:

http://www.state.nj.us/dca/divisions/codes/publications/pdf_bulletins/b_03_5.pdf

a. Definition:

Special inspections are defined as an independent verification by a certified special inspector for **Class I buildings and smoke control systems in any class building**. The special inspector is to be independent from the Contractor and responsible to the Consultant so that there is no possible conflict of interest.

Special inspectors shall be certified in accordance with the requirements in the New Jersey Uniform Construction Code.

b. Responsibilities:

The Consultant shall submit with the permit application, a list of special inspections and the agencies or special inspectors that will be responsible to carry out the inspections required for the project. The list shall be a separate document, on letter head, signed and sealed.

B. OTHER REGULATORY AGENCY PERMITS, CERTIFICATES AND APPROVALS

The Consultant shall identify and obtain all other State Regulatory Agency permits, certificates, and approvals that will govern and affect the work described in this Scope of Work. An itemized list of these permits, certificates, and approvals shall be included with the Consultant's Technical Proposal and the total amount of the application fees should be entered in the Fee Proposal line item entitled, "**Permit Fee Allowance.**"

The Consultant may refer to the Division of Property Management and Construction “Procedures for Architects and Engineers Manual”, Paragraph “**9. REGULATORY AGENCY APPROVALS**” which presents a compendium of State permits, certificates, and approvals that may be required for this project.

The Consultant shall determine the appropriate phase of the project to submit the permit application(s) in order to meet the approved project milestone dates.

Where reference to an established industry standard is made, it shall be understood to mean the most recent edition of the standard unless otherwise noted. If an industry standard is found to be revoked, or should the standard have undergone substantial change or revision from the time that the Scope of Work was developed, the Consultant shall comply with the most recent edition of the standard.

IX. ENERGY REBATE AND INCENTIVE PROGRAMS

The Consultant shall review any and all programs on the State and Federal level to determine if any proposed upgrades to the mechanical and/or electrical equipment and systems for this project qualify for approved rebates and incentives.

The Consultant shall review the programs available on the “New Jersey’s Clean Energy Program” website at: <http://www.njcleanenergy.com> as well as federal websites and New Jersey electric and gas utility websites to determine if and how they can be applied to this project.

The Consultant shall identify all rebates and incentives in their technical proposal and throughout the design phase.

The Consultant shall be responsible to complete the appropriate registration forms and applications, provide any applicable worksheets, manufacturer’s specification sheets, calculations, attend meetings, and participate in all activities with designated representatives of the programs and utility companies to obtain the entitled financial incentives and rebates for this project.

All costs associated with this work shall be estimated by the Consultant and the amount included in the base bid of its fee proposal.

X. ALLOWANCES

A. PLAN REVIEW AND PERMIT FEE ALLOWANCE

The Consultant shall obtain and pay for all of the project permits in accordance with the guidelines identified below.

1. Permits:

The Consultant shall determine the various permits, certificates, and approvals required to complete this project.

2. Permit Costs:

The Consultant shall estimate the application fee costs for all of the required project permits, certificates, and approvals (excluding the NJ Uniform Construction Code permit) and include that amount in its fee proposal line item entitled “**Plan Review and Permit Fee Allowance**”. A breakdown of each permit and application fee shall be attached to the fee proposal for reference.

NOTE: The NJ Uniform Construction Code permit is excluded since it will be paid for by the State.

3. Applications:

The Consultant shall complete and submit all permit applications to the appropriate permitting authorities and the costs shall be paid from the Consultant’s permit fee allowance. A copy of the application(s) and the original permit(s) obtained by the Consultant shall be given to the DPMC Project Manager for distribution during construction.

4. Consultant Fee:

The Consultant shall determine what is required to complete and submit the permit applications, obtain supporting documentation, attend meetings, etc., and include the total cost in the base bid of its fee proposal under the “Permit Phase” column.

Any funds remaining in the permit allowance will be returned to the State at the close of the project.

B. HAZARDOUS MATERIALS TESTING AND REPORT ALLOWANCE

Consultant shall estimate the costs to complete the hazardous materials survey, sample collection, testing and analysis and preparation of a “Hazardous Materials Survey Report” noted in paragraph VII.B and enter that amount on their fee proposal line item entitled “**Hazardous**

Materials Testing and Report Allowance". Consultant shall attach a detailed cost breakdown sheet for use by DPMC during the proposal review and potential fee negotiations. The cost breakdown sheet shall include, but not be limited to, the following information:

- Description of tasks and estimated cost for the following:
 - Sample collection
 - Sample testing
 - Preparation of an Hazardous Materials Survey Report

Any funds remaining in the Hazardous Materials Testing and Report Allowance will be returned to the State at the close of the project.

C. HAZARDOUS MATERIALS ABATEMENT DESIGN ALLOWANCE

Consultant shall estimate the costs to prepare construction documents for hazardous materials abatement noted in paragraph VII.B and enter that amount on their fee proposal line item entitled **"Hazardous Materials Abatement Design Allowance"**. Consultant shall attach a detailed cost breakdown sheet for use by DPMC during the proposal review and potential fee negotiations. The cost breakdown sheet shall include a description of the tasks to be performed and the estimated cost of each task.

Any funds remaining in the Hazardous Materials Abatement Design Allowance will be returned to the State at the close of the project.

D. HAZARDOUS MATERIALS CONSTRUCTION ADMINISTRATION ALLOWANCE

Consultant shall estimate the cost to provide Construction Monitoring and Administration Services for hazardous materials abatement as noted in paragraph VII.B and enter that amount on their fee proposal line item entitled **"Hazardous Materials Construction Administration Allowance"**. Consultant shall attach a detailed cost breakdown sheet for use by DPMC during the proposal review and potential fee negotiations. The cost breakdown sheet shall include a description of the tasks to be performed and the estimated cost of each task.

Any funds remaining in the Hazardous Materials Construction Administration Allowance will be returned to the State at the close of the project.

E. ROOF MONITOR ALLOWANCE

The Consultant shall provide a full time roof monitor pre-qualified with DPMC in the P028 Roofing Inspection Specialty Discipline during the installation of the roof system on the building. See section VII, paragraph C of this Scope of Work for a description of services to be provided by a roof monitor.

The costs for the services provided by the roof monitor shall be included in the “**Roof Monitor Allowance**” of their fee proposal. A cost breakdown sheet shall accompany the fee proposal that identifies all costs associated with the Roof Monitoring services to be provided.

Any funds remaining in the Allowance shall be returned to the State at the end of the project.

F. STRUCTURAL INVESTIGATION ALLOWANCE

If materials have to be stored on the structure, the Consultant shall estimate the cost to provide structural calculations indicating maximum loading criteria, and provide Design, Construction Administration, Permitting and Bid/Award services to repair the roof structural components as necessary and include that amount in their fee proposal line item entitled “**Structural Investigation Allowance**”. The cost breakdown sheet shall include a description of the tasks to be performed and the estimated cost of each task.

Any funds remaining in the structural investigation allowance will be returned to the State at the close of the project.

PROJECT NAME: Trenton Office Complex Roof Restoration
PROJECT LOCATION: MVC Center Headquarters Building
PROJECT NO: A1382-00
DATE: December 7, 2023

XI. SOW SIGNATURE APPROVAL SHEET

This Scope of Work shall not be considered a valid document unless all signatures appear in each designated area below.

The client agency approval signature on this page indicates that they have reviewed the design criteria and construction schedule described in this project Scope of Work (including the subsequent contract deliverables and exhibits) and verifies that the work will not conflict with the existing or future construction activities of other projects at the site.

SOW PREPARED BY: Lucy Ibrahim 12/07/2023
LUCY IBRAHIM, PROJECT MANAGER DATE
DPMC PROJECT PLANNING & INITIATION

SOW APPROVED BY: James Wright 12/7/2023
JAMES WRIGHT, MANAGER DATE
DPMC PROJECT PLANNING & INITIATION

SOW APPROVED BY: Mark Dae 12/08/2023
MARK DAE, ASSISTANT CHIEF ENGINEER & PLANT DATE
DPMC PROJECT MANAGEMENT GROUP

SOW APPROVED BY: Nurul Hasan 12/11/2023
NURUL HASAN, PROJECT MANAGER DATE
DPMC PROJECT MANAGEMENT GROUP

SOW APPROVED BY: Richard Flodmand 12/12/2023
RICHARD FLODMAND, DEPUTY DIRECTOR DATE
DIV PROPERTY MGT & CONSTRUCTION

XII. CONTRACT DELIVERABLES

The following are checklists listing the Contract Deliverables that are required at the completion of each phase of this project. The Consultant shall refer to the DPMC publication entitled “Procedures for Architects and Engineers,” 3.0 Edition, dated September 2022 available at <https://www.nj.gov/treasury/dpmc/Assets/Files/ProceduresforArchitectsandEngineers.pdf> for a detailed description of the deliverables required for each submission item listed. References to the applicable paragraphs of the “Procedures for Architects and Engineers” are provided.

Note that the Deliverables Checklist may include submission items that are “S.O.W. Specific Requirements”. These requirements will be defined in the project specific scope of work and included on the deliverables checklist.

This project includes the following phases with the deliverables noted as “Required by S.O.W” on the Deliverables Checklist:

- **DESIGN DEVELOPMENT PHASE**
- **FINAL DESIGN PHASE**
- **PERMIT APPLICATION PHASE**
- **BIDDING AND CONTRACT AWARD**
- **CONSTRUCTION PHASE**
- **PROJECT CLOSE-OUT PHASE**

XIII. EXHIBITS

- A. SAMPLE PROJECT SCHEDULE FORMAT
- B. PROJECT SITE LOCATION MAP
- C. EXISTING PHOTOS
- D. ROOF EVALUATION REPORT MVC TRENTON NJ

END OF SCOPE OF WORK

Deliverables Checklist Design Development Phase

A/E Name: _____

A/E Manual Reference	Submission Item	Required by S.O.W.		Previously Submitted		Enclosed	
		Yes	No	Yes	No	Yes	No
14.4.1.	A/E Statement of Site Visit						
14.4.2.	Narrative Description of Project						
14.4.3.	Building Code Information Questionnaire						
14.4.4.	Space Analysis						
14.4.5.	Special Features						
14.4.6.	Catalog Cuts						
14.4.7.	Site Evaluation						
14.4.8.	Subsurface Investigation						
14.4.9.	Surveys						
14.4.10.	Arts Inclusion						
14.4.11.	Design Rendering						
14.4.12.	Regulatory Approvals						
14.4.13.	Utility Availability						
14.4.14.	Drawings (6 Sets)						
14.4.15.	Outline Specifications (6 Sets)						
14.4.16.	Current Working Estimate/Cost Analysis						
14.4.17.	Project Schedule						
14.4.18.	Formal Presentation						
14.4.19.	Plan Review/Scope of Work Compliance Statement						
14.4.20.	Design development Phase Deliverables Checklist						
S.O.W. Reference	S.O.W. Specific Requirements						

This checklist shall be completed by the Design Consultant and included as the cover sheet of this submission to document to the DPMC the status of all the deliverables required by the project specific Scope of Work.

Consultant Signature

Date

February 7, 1997
Rev.: January 29, 2002

Responsible Group Code Table

The codes below are used in the schedule field "GRP" that identifies the group responsible for the activity. The table consists of groups in the Division of Property Management & Construction (DPMC), as well as groups outside of the DPMC that have responsibility for specific activities on a project that could delay the project if not completed in the time specified. For reporting purposes, the groups within the DPMC have been defined to the supervisory level of management (i.e., third level of management, the level below the Associate Director) to identify the "functional group" responsible for the activity.

<u>CODE</u>	<u>DESCRIPTION</u>	<u>REPORTS TO ASSOCIATE DIRECTOR OF:</u>
CM	Contract Management Group	Contract Management
CA	Client Agency	N/A
CSP	Consultant Selection and Prequalification Group	Technical Services
A/E	Architect/Engineer	N/A
PR	Plan Review Group	Technical Services
CP	Construction Procurement	Planning & Administration
CON	Construction Contractor	N/A
FM	Financial Management Group	Planning & Administration
OEU	Office of Energy and Utility Management	N/A
PD	Project Development Group	Planning & Administration

EXHIBIT 'A'

Activity ID	Description	Respon	Weeks
<PROJ>			
Design			
CV3001	Schedule/Conduct Pre-design/Project Kick-Off Mtg.	CM	
CV3020	Prepare Program Phase Submittal	AE	
CV3021	Distribute Program Submittal for Review	CM	
CV3027	Prepare & Submit Project Cost Analysis (DPMC-38)	CM	
CV3022	Review & Approve Program Submittal	CA	
CV3023	Review & Approve Program Submittal	PR	
CV3024	Review & Approve Program Submittal	CM	
CV3025	Consolidate & Return Program Submittal Comments	CM	
CV3030	Prepare Schematic Phase Submittal	AE	
CV3031	Distribute Schematic Submittal for Review	CM	
CV3037	Prepare & Submit Project Cost Analysis (DPMC-38)	CM	
CV3032	Review & Approve Schematic Submittal	CA	
CV3033	Review & Approve Schematic Submittal	PR	
CV3034	Review & Approve Schematic Submittal	CM	
CV3035	Consolidate & Return Schematic Submittal Comment	CM	
CV3040	Prepare Design Development Phase Submittal	AE	
CV3041	Distribute D. D. Submittal for Review	CM	
CV3047	Prepare & Submit Project Cost Analysis (DPMC-38)	CM	
CV3042	Review & Approve Design Development Submittal	CA	
CV3043	Review & Approve Design Development Submittal	PR	
CV3044	Review & Approve Design Development Submittal	CM	
CV3045	Consolidate & Return D.D. Submittal Comments	CM	
CV3050	Prepare Final Design Phase Submittal	AE	
CV2001	Distribute Final Design Submittal for Review	CM	
CV3052	Review & Approve Final Design Submittal	CA	
CV3053	Review & Approve Final Design Submittal	PR	
CV3054	Review Final Design Submittal for Constructability	OCS	

Sheet 1 of 3

Bureau of Design & Construction Services

EXHIBIT 'A'

NOTE:
Refer to section "IV Project Schedule" of the
Scope of Work for contract phase durations.

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Activity ID	Description	Respn	Weeks
CV6014	Roughing Work Complete	CON	
CV6021	Interior Finishes Start	CON	
CV6022	Install Interior Finishes	CON	
CV6030	Contract Work to Substantial Completion	CON	
CV6031	Substantial Completion Declared	CM	
CV6075	Complete Deferred Punch List/Seasonal Activities	CON	
CV6079	Project Construction Complete	CM	
CV6080	Close Out Construction Contracts	CM	
CV6089	Construction Contracts Complete	CM	
CV6090	Close Out A/E Contract	CM	
CV6092	Project Completion Declared	CM	

DBCA - TEST

Sheet 3 of 3

Bureau of Design & Construction Services

EXHIBIT 'A'

NOTE:
Refer to section "IV Project Schedule" of the
Scope of Work for contract phase durations.

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TRENTON OFFICE COMPLEX - (MVC BUILDING)



EXHIBIT 'B'

TRENTON OFFICE COMPLEX - (MVC BUILDING)

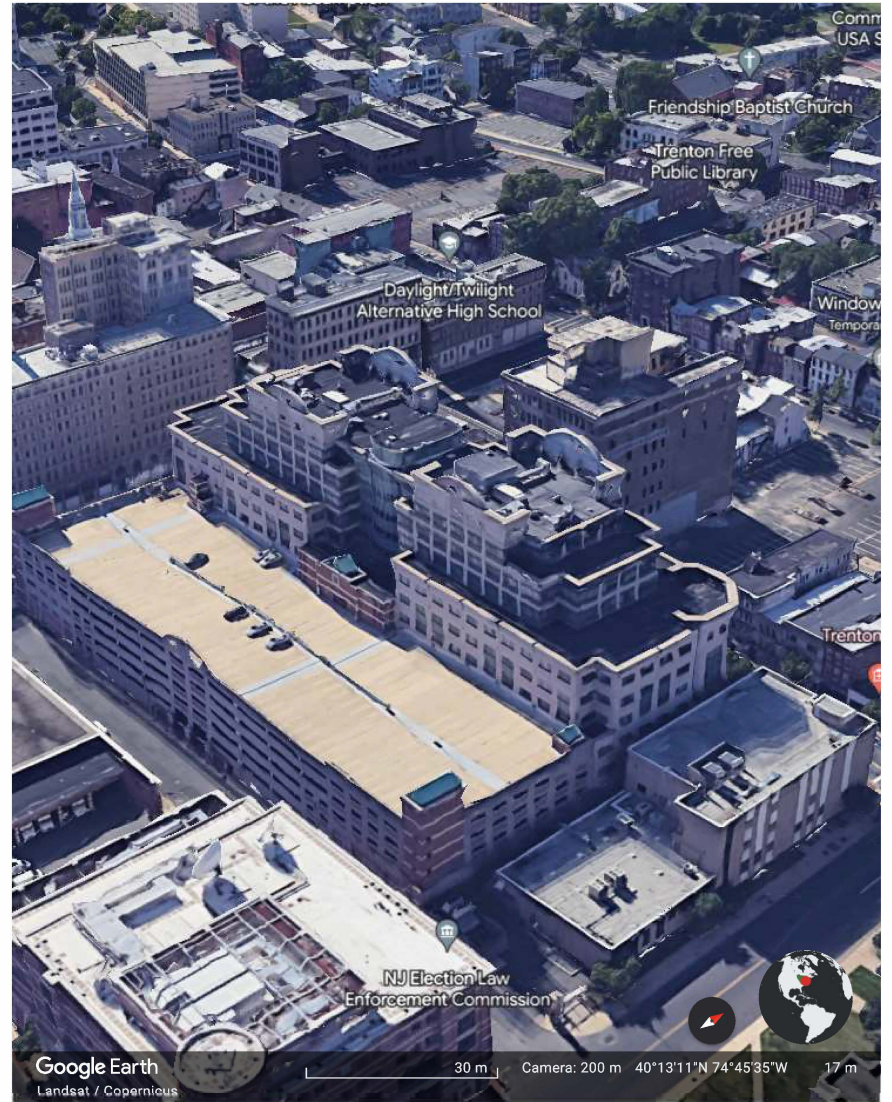
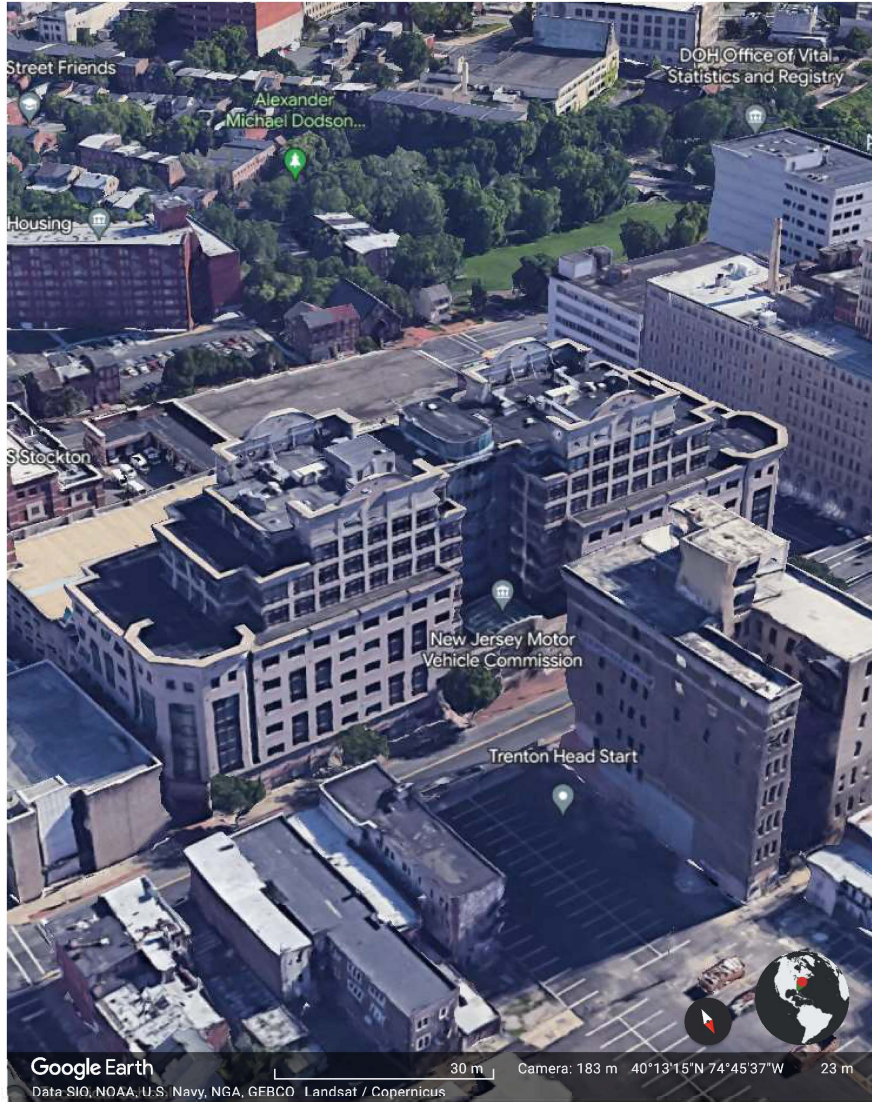


EXHIBIT 'B'

TRENTON OFFICE COMPLEX - (MVC BUILDING)



EXHIBIT 'C'

TRENTON OFFICE COMPLEX - (MVC BUILDING)



EXHIBIT 'C'

SEPTEMBER 2018

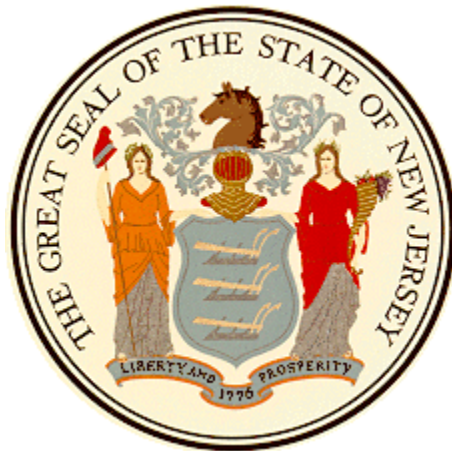
PHASE I ROOF AUDIT

**MOTOR VEHICLES SERVICES ADMINISTRATION BUILDING
225 EAST STATE STREET
TRENTON, NJ
DPMC AGENCY CONSULTANT CONTRACT NUMBER: J0357-00
AGENCY WORK ORDER NUMBER: 01**

prepared for

STATE OF NEW JERSEY

**HONORABLE PHIL MURPHY, GOVERNOR
HONORABLE SHEILA OLIVER, LIEUTENANT GOVERNOR**



DEPARTMENT OF THE TREASURY
Elizabeth Maher Muoio, State Treasurer

DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION
Christopher Chianese, Director

Prepared by
ARMM Associates, Inc.
725 Kenilworth Avenue
Cherry Hill, NJ 08002
856-665-8484
ARMM's Reference #18022

EXHIBIT 'D'

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EXHIBIT 'D'

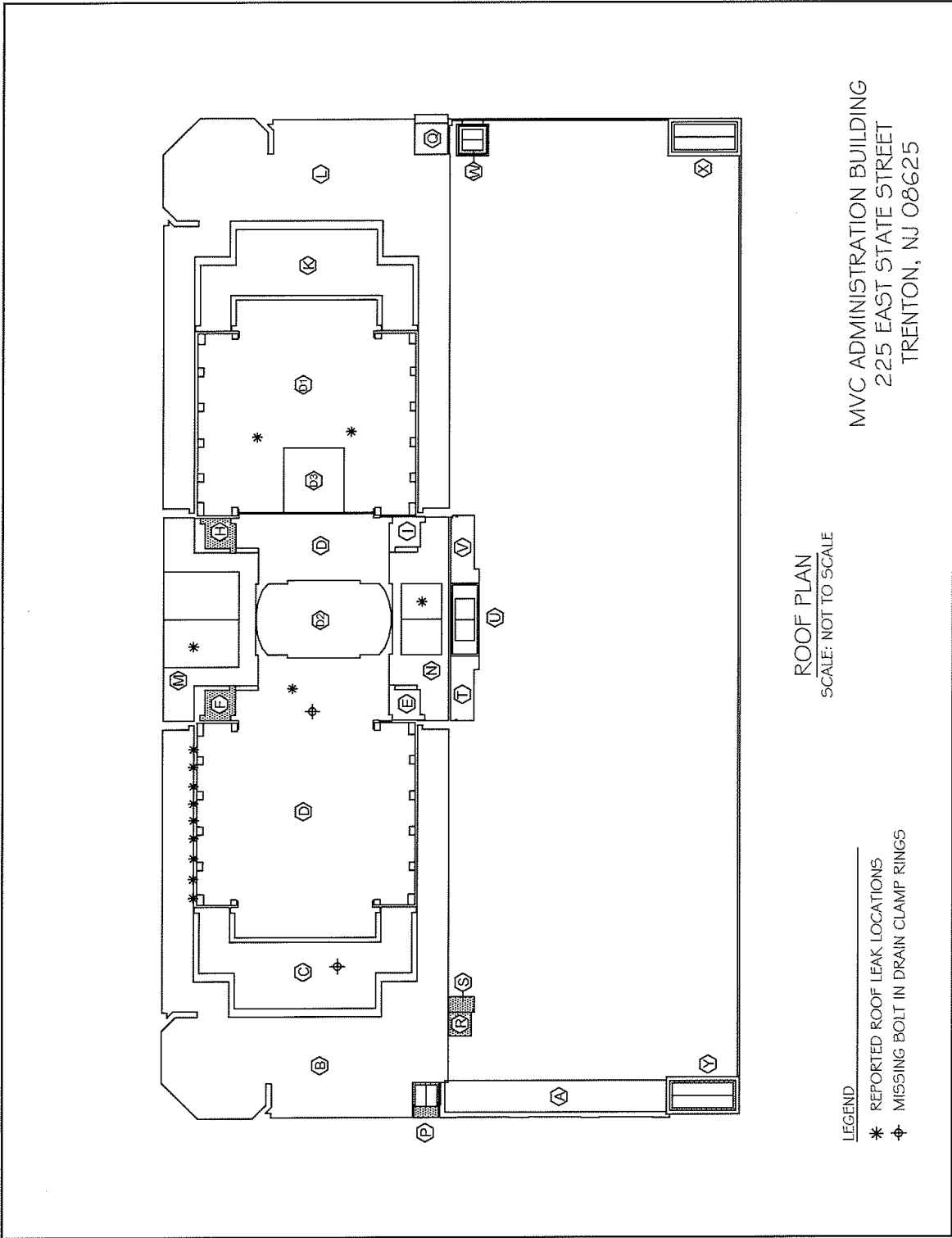
FOREWORD

On Tuesday, July 31, 2018 a visit was made to Trenton, NJ by ARMM Associates, Inc. for the purpose of inspecting and evaluating the existing EPDM roofing system over the Motor Vehicle Commission building.

The following study was conducted to provide factual information to the State of new Jersey, Division of Property Management and Construction as to:

1. Existing condition of the roof systems in place over the facility.
2. Identify the cause of existing leaks.
3. Identify the cause of the existing delaminated insulation.
4. Problem areas of the roof system and required repairs and/or maintenance
5. Recommendations for repair and/or replacement.
6. Priority listing and budget cost for repairs and/or replacement.

The Motor Vehicle Commission roof has been divided into twenty-five (25) roof areas. Each roof area has been lettered, which are indicated on the enclosed roof plans. A pictorially illustrated report on existing conditions is included herein.



MVC ADMINISTRATION BUILDING
 225 EAST STATE STREET
 TRENTON, NJ 08625

ROOF PLAN
 SCALE: NOT TO SCALE

LEGEND
 * REPORTED ROOF LEAK LOCATIONS
 ⊕ MISSING BOLT IN DRAIN CLAMP RINGS

EXHIBIT 'D'

EXECUTIVE SUMMARY

With the exception of Roof Areas B , C, D1, D2, K and L, ARMM found the EPDM (Ethylene Propylene Diene Monomer) system on the remaining areas to be in fair condition. The roof system is approximately eleven (11) years old with nine (9) years remaining in the manufacturer's warranty. The following repair items must be addressed for the EPDM roof system to function properly for another nine (9) years. Roof Areas B and L are now requiring total removal and replacement due to the severe delamination of the membrane and underlying insulation.

Holes in the EPDM membrane were found on Roof Areas D, D1, D3 and L. The locations were marked on the roof and indicated on an enclosed roof plan.

Delaminating vertical lap seams and associated support patches were found on the majority of roof areas. Each opening was marked on the roof and each location can be found on the enclosed roof plan.

HVAC equipment lines and curtain wall steel "I" beam supports that penetrate the roof were flashed with pourable sealer pans. Openings were found between the pourable sealer and both the pan and penetrations.

There are round metal support pipes for the curtain walls on Roof Areas D and D1 that penetrate the roof system. The base of each pipe support was flashed with an EPDM membrane wrapping. At the top leading edge of the EPDM membrane wrapping on nine (9) of the support pipes, the membrane has pulled away from the pipes allowing access for water entry. At these locations, rusting pipe was found. To prevent this from occurring on the remaining pipe supports, all pipe flashing wraps should be removed and replaced.

At Roof Areas B, C, D1, D2, K and L, there are sections of each roof area whereby the insulation is delaminated from the structural concrete deck. At these locations, the EPDM membrane is raised approximately 3" up to approximately 24".

On September 19, 2018 sample cuts were taken by Patriot Roofing at Areas B and L. Due to the extent of the delamination, ARMM cannot recommend repairs to these areas as the existing insulation is saturated with water found on the surface of the concrete deck. ARMM observed that the insulation boards have overlapped one other in various sections of Roof Areas B and L. These areas now require total removal and replacement at this time. The delamination of insulation at Areas C, D1, D2 and K are not as significant as noted at Areas B and L and, in ARMM's opinion, can be repaired.

On Roof Area D, there is a section of the perimeter metal edge that is missing. It can be reasonably assumed that the missing piece below blew off during a storm. The remaining metal edge pulled off the hold down cleat. The nailed flange and tape are holding the metal edge in place. To prevent possible future damage to the roof, new metal drip edge must be installed.

EXISTING ROOF COMPOSITES AND ROOF AREA QUANTITIES

All Roof Areas:

60 mil EPDM reinforced (ethylene propylene diene terpolymer) membrane system
 ¼ inch thick high-density polyisocyanurate insulation board
 Tapered polyisocyanurate insulation board
 Concrete deck

Roof Areas M, N, and P:

A portion of the roofs incorporated sky lights.

Roof Areas W, X and Y:

A portion of the roofs incorporated a standing seam metal roof.

ROOF AREA QUANTITY	
Roof Area Designation	Approximate Square Feet
A	1,316
B	8,149
C	3,735
D	12,439
D1	8,261
D2	1,824
D3	702
E	177
F	177
H	177
I	177
K	3,735
L	8,149
M	1,456 roofing/ 1,280 skylight
N	1,399 roofing/ 510 skylight
P	87 roofing/ 81 skylight
Q	182
R	100
S	77
T	220
U	146 roofing/ 144 standing seam
V	255
W	40 roofing/ 81 standing seam
X	27 sq. ft. roofing/ 275 sq. ft. standing seam metal roof
Y	27 sq. ft. roofing/ 275 sq. ft. standing seam metal roof
TOTAL	EPDM ROOF AREAS = 53,034 SQUARE FEET STANDING SEAM METAL ROOF AREAS = 694 SKYLIGHT AREAS = 1,871

EXHIBIT 'D'

Sections on roof areas where the insulation adhered to the concrete deck delaminated raising the EPDM membrane

Roof Area Designation	Approximate Square Feet
B	5,500
C	50
D1	108
D3	18
K	400
L	5,600
M	20
Total	11,696

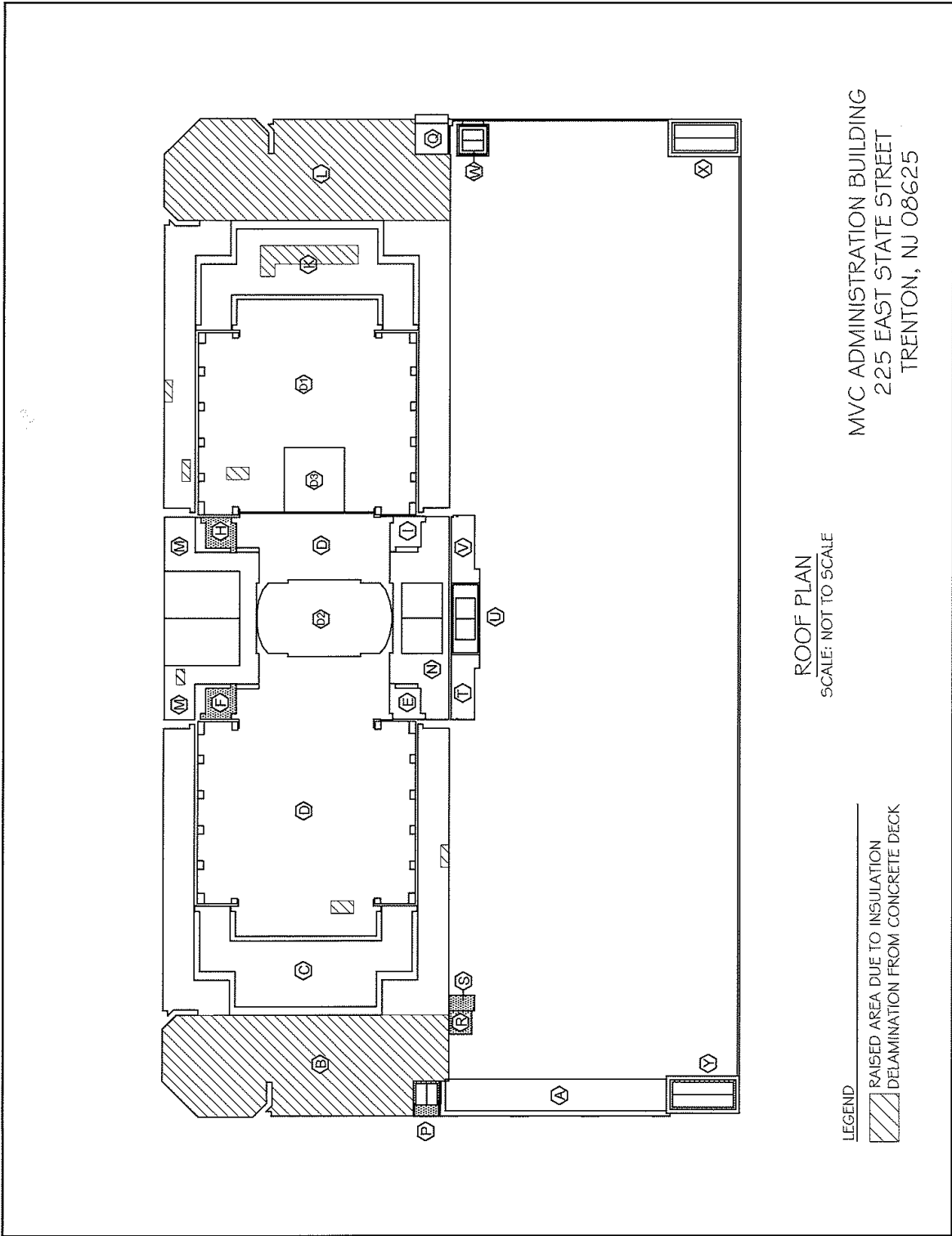
Open Lap Seams or Patches Delaminating

Roof Area Designation	Amount
A	6
B	8
C	18
D	24
D1	17
D2	7
D3	2
K	3
L	14
N	6
Q	1
R	3
S	2
T	3
U	6
Total	120

Approximately 30 linear feet of drip edge on Roof Area D was damaged. Drip edge must be removed and replaced with new (see adjacent photo).



EXHIBIT 'D'



MVC ADMINISTRATION BUILDING
 225 EAST STATE STREET
 TRENTON, NJ 08625

ROOF PLAN
 SCALE: NOT TO SCALE

LEGEND
 [Diagonal Hatching] RAISED AREA DUE TO INSULATION
 [Cross-hatching] DELMINATION FROM CONCRETE DECK

EXHIBIT 'D'

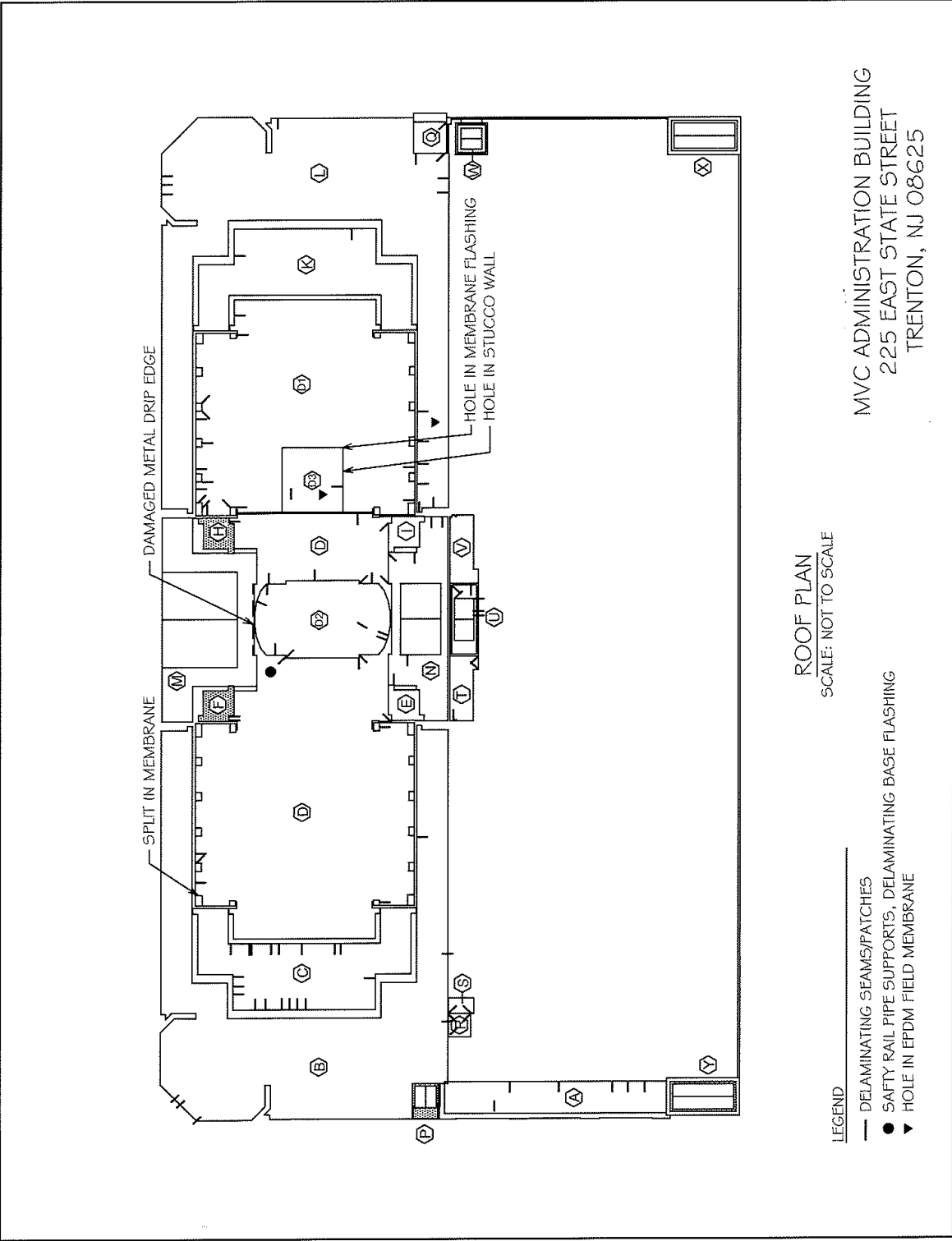


EXHIBIT 'D'

DISCUSSION

ARMM's representative met with Don Nawn, the site maintenance manager representing Meridian Property Services. Don gave me a master key along with an access card key which would allow me to access all roof areas on the buildings. He then escorted me to the main roof portion of the building which is designated Roof Area D. As we walked out of the roof access door on Roof Area D2, Don pointed out a section of the roof that was raised. The insulation delaminated from the roof deck and buckled. The raised EPDM membrane did not create any openings that would allow water into the system. Don informed me that on Roof Areas B, C, K and L, there are larger sections and the roof is raised a lot more than this section. Other concerns were required membrane patches that were installed during the initial installation that are bubbling, which some bubbles have popped. I explained to Don that these patches were installed at intersecting field lap seams and at the base of walls where seams turn up vertically. These are points of the roof where manufacturers require patches as additional protection. These patches can also be found on corners of walls and all roof penetration flashings.

Don introduced me to Phil, a maintenance worker in the building who would help me out during my inspection. Phil showed me all the areas where leaks are occurring. Phil stated that he believed that the majority of leaks occur at window walls and skylights (leak locations can be found on an enclosed roof plan). The area where the majority of leaks occur is at the window wall on the North side of Roof Area B. Above that window wall on Roof Area B, there is a curtain wall.

The curtain wall incorporates steel "I" beam supports that are set on raised concrete supports that have pourable sealer pan flashings. All along the base of the inside wall and concrete supports, there were open seams that were marked indicating where repairs were necessary. The sealer pan flashings were also marked for repair. When installing the pan flashing prior to installing the pourable sealer, all penetrations and the inside of the pan itself must be primed. If the priming is not done properly, the pourable sealer will not adhere leaving gaps as shown in the adjacent photograph.



After marking the above mentioned items on roof area D the first day of the inspection, I did not return the following day due to a scheduled appointment. The next day that I returned, I found the open wall base flashings that I had marked were repaired. Speaking with Phil, Patriot Roofing was onsite making repairs. Phil stated that the contractor only repaired the open seams and not the pourable sealer pans because the pans were not covered under the manufacturer's warranty. Phil also informed me that the contractor was told not to make anymore repairs until ARMM completes their report. After a rain event, Phil informed me that a lot of reported leaks along the window wall on Roof Area B did not occur. This is the area where Patriot Roofing repaired the open seams. Because of the openings in the pourable sealer pan has not been addressed, there is a good possibility that once this repair work is complete the remaining leaks may stop.

There were two (2) reported leaks on Roof Area D1. One (1) leak location appears to be occurring at a HVAC pourable sealer pan. The other reported leak locations was at the base of the wall leading up to Roof Area D3. The roof system at the base of the wall was different from the system installed on all of

EXHIBIT 'D'

the other roof areas. In this area, an IRMA (inverted roof membrane assembly) system was installed. In this system, the EPDM membrane was attached to the deck followed by insulation and a layer of fabric covered with concrete pavers. All portions of the system were removed to expose the EPDM membrane attached to the deck. A hole was found in the EPDM membrane in the corner at the base of the wall. This location was marked and the roof components were reinstalled. The photograph below shows the hole in the EPDM membrane.



The other two (2) reported leaks occurred at the two (2) large skylights; one (1) on Roof Area M and the other on Roof Area N.

The following are anomalies found and marked showing where repairs are required at each area.



1. Roof Area A: Inside wall EPDM membrane base flashing, vertical lap seams and support patches are open.

EXHIBIT 'D'



2. Roof Area A: Delaminating lap seam support patch on parapet.



3. Roof Area A: Coping stone on parapet wall has cracked. Based on the black material in the crack which appears like an asphaltic roof cement and the newer caulk, this is a problem area.

EXHIBIT 'D'



1. Roof Area B: Vegetation growth obstructing drainage.



2. Roof Area B: Partial overall view of an area the insulation has delaminated from the concrete deck.

EXHIBIT 'D'



3. Roof Area B: Overall views showing the raised EPDM from delaminated insulation from the concrete deck that has buckled. This did not affect the waterproof integrity of the roof. Sample cuts were performed as discussed later within this report under the Roof Cut Analysis Section.



1. Roof Area C: View showing raised EPDM membrane from delaminated insulation from the concrete deck that has buckled.

EXHIBIT 'D'



2. Roof Area C: Missing drain clamping ring bolt.



3. Roof Area C: Delaminating corner patch at the inside window wall.

EXHIBIT 'D'



4. Roof Area C: Two open lap seams in the EPDM membrane flashing on the parapet wall.



5. Roof Area C: Both bottom frame mitered corners on the swinging roof access window are loose.

EXHIBIT 'D'



1. Roof Area D: Slice in the EPDM membrane at the base of the wall.



2. Roof Area D: Pencil indicating an opening.

EXHIBIT 'D'



3. Roof Area D: Pourable sealer pan flashing at the base of a steel "I" beam. Gaps were found between the "I" beam and the pourable sealer. There is also a split coming off of the end of the beam.



4. Roof Area D: Various openings in the pourable sealer pan flashing.

EXHIBIT 'D'

5. Roof Area D: Pencil showing open upper leading edge of the EPDM base flashing wrap on a curtain wall pipe support.



6. Roof Area D: Delaminating vertical lap seams in the parapet wall membrane flashing.

7. Roof Area D: Safety rail support pipe EPDM membrane flashing wrap delaminating.



EXHIBIT 'D'



8. Roof Area D: HVAC supply and support line penetrations in a pourable sealer flashing pan. The pourable sealer is in a degraded condition.



9. Roof Area D: Missing drain clamping ring bolt clamping the EPDM membrane to the drain. A missing bolt could eventually allow the clamping ring to loosen. If this occurs, it will create an opening for water entry.

EXHIBIT 'D'



1. Roof Area D1: Typical open EPDM membrane open vertical lap seams on parapet wall.



2. Roof Area D1: Typical open EPDM membrane wrap at the base of a curtain wall pipe support.

EXHIBIT 'D'



3. Roof Area D1: Typical degrading pourable sealer flashing pans at the base of the curtain wall "I" beam supports.



4. Roof Area D1: Area approximately 108 square feet, insulation delaminated from the concrete deck raised the EPDM roofing membrane. This problem did not create openings in the roofing system to create leaks.

5. Roof Area D1: Typical degrading pourable sealer flashing for HVAC supply and support lines.



EXHIBIT 'D'



6. Roof Area D1: Arrow at the photograph on left indicates a reported leak location. After removing the concrete pavers the arrow on the right photograph shows location of a hole in the wall EPDM membrane flashing.



7. Roof Area D1: Hole in the stucco wall leading up to Roof Area D2.

EXHIBIT 'D'



1. Roof Area D2: Area approximately 18 square feet where the insulation delaminated from the concrete deck.



2. Roof Area D2: Typical open lap seams at an elevation change.

EXHIBIT 'D'



1. Roof Area D3: Hole found in the field of the roof. This hole is in an area that appears to be an elevator motor room/ utility room. An inspection of this room water was found on the floor.

2. Roof Area D3: Typical delaminating corner patches.



On Roof Areas E, H and I no deficiencies were found.



1. Roof Area F: Two (2) openings were found in the EPDM membrane wall flashing.

EXHIBIT 'D'



1. Roof Area K: Section of the roof is raised because the insulation delaminated from the concrete deck.



2. Typical delaminating support patches at the base of the parapet wall.

EXHIBIT 'D'



1. Roof Area L: Large section of this roof area (back right of picture) is raised from delaminated insulation from the concrete deck which has buckled. This condition has not created damages that would cause leaks. Sample cuts were performed; a full discussion of our findings can be found within the Roof Cut Analysis Section of this report.



- 2A. Roof Area L: The above photograph shows smaller sections of delaminated insulation raising the EPDM membrane.

EXHIBIT 'D'



2B. Roof Area L: The above two (2) photographs again show additional smaller sections of delaminated insulation raising the EPDM membrane.

3. Roof Area L: Typical delaminating T patches.



4. Roof Area L: Hole in the field EPDM membrane.

EXHIBIT 'D'



1. Roof Area M: A section of the roof where the insulation delaminated from the concrete deck which buckled raising the EPDM roof membrane.



2. Roof Area M: A field lap seam that has been stripped. The stripping is beginning to delaminate.

EXHIBIT 'D'



1. Roof Area N: Typical EPDM membrane delamination.

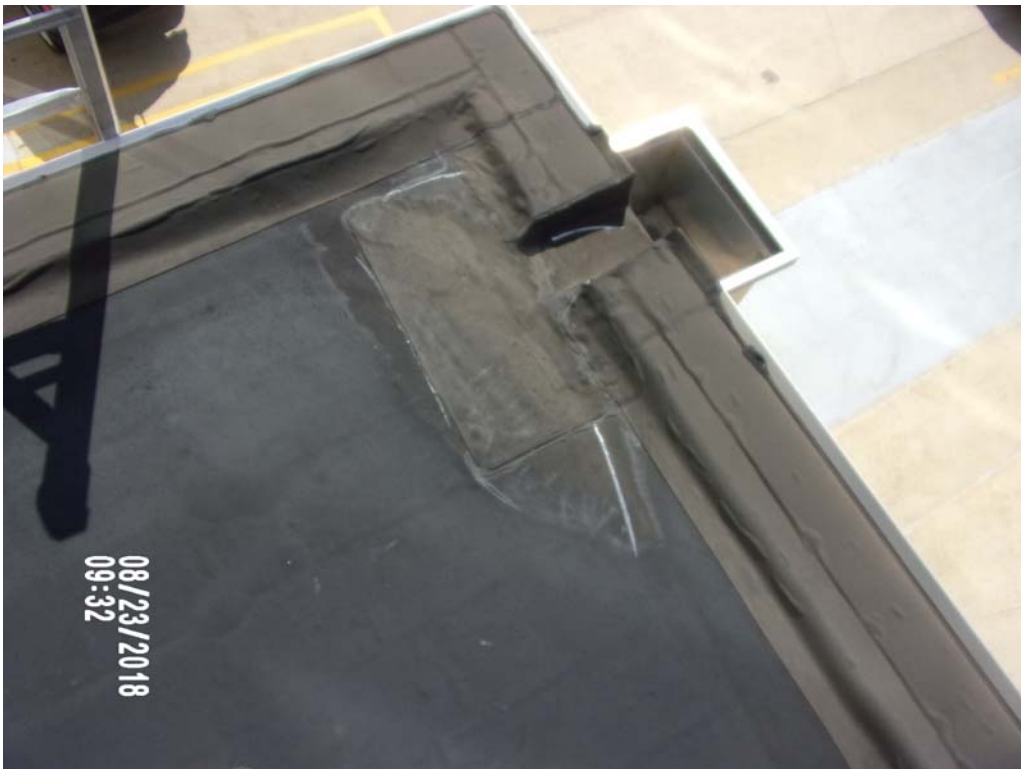


1. Roof Area P: Overall view showing a clogged roof drain. Note the entire roof surface is covered with water. I spoke with Don Nawn from Meridian Property Management who stated that there were no leaks on this roof. Don stated that he would have the drain cleared so that the roof will drain.

EXHIBIT 'D'



1. Roof Area Q: Typical delaminating inside corner patch.



1. Roof Area R: Delaminating scupper EPDM stripping.

EXHIBIT 'D'



2. Roof Area R: Delaminating expansion joint end corner.



1. Roof Area S: Typical delaminating membrane.

EXHIBIT 'D'



1. Roof Area T: Delaminated wall flashing corner patch.

2. Roof Area T: Additional deteriorated wall flashing corner patch.



3. Roof Area T: Perimeter metal edge flange stripping delaminated.

EXHIBIT 'D'



1. Roof Area L1: The majority of this roof area incorporates a standing seam metal roof which appeared to be in good condition, surrounding the metal roof is a flat EPDM roof system.



2. Roof Area L1: Field lap seam stripping opening at the base of the elevation change.

EXHIBIT 'D'



3. Typical opening in corner patch.



4. Roof Area L1: Photograph showing the delamination of the EPDM membrane (typical at several locations). Note that water lays (ponds) at this location. It appears that water *may have* entered through these openings (open lap seams). If water has not yet entered the system at this location; if left unrepaired, leaks / water infiltration will be realized.

EXHIBIT 'D'



1. Roof Area V: View of an outside corner wall flashing which incorporated termination bars. At the bottom of both vertical termination bars, the membrane was penetrated by the bars.



1. Roof Area W: View shows this roof area to be a standing seam metal roof surrounded by a flat EPDM membrane roof system.

EXHIBIT 'D'



2. Roof Area W: Opening in the EPDM membrane parapet wall flashing.



3. Roof Area W: Corner patch delaminating in an area that ponds water.

EXHIBIT 'D'



Top Level Parkade: Where the stairwell / elevator shaft extensions meet the main portion of the building the existing expansion joints are in a degraded condition. ARMM was not engaged to inspect exterior wall vertical expansion joints. ARMM is providing these photographs to inform the owner of the current condition so that steps can be taken before problems arise.

EXHIBIT 'D'

ROOF CUT ANALYSIS DISCUSSION

ARMM Associates performed a series of roof cuts on September 19, 2018 to obtain a better understanding of the conditions on the roof of the MVC Building in Trenton, NJ.

The roofing system consists of an EPDM membrane with multiple layers of isocyanurate insulation board and a 1/4" hard board to give a hard substrate and thermal characteristics to the 25 PSI isocyanurate insulation.

The roof cuts revealed there is thermal movement within the insulation stack. The overall application has a thermal condition which was induced by moisture that came from the wall systems and with the accumulation of moisture within the "insulation enclosed system" produced geometric movement within the insulation.

The roof was installed in 2007. The copings and stonework received caulking in 2005. There is no indication as to what type of caulking that was utilized. The John Mansville representative indicated the caulking had failed shortly after the roof was installed.

Discussions and interviews with representatives indicate moisture had permeated into the field of the roof and started to produce some delamination in the installation by 2012. By 2017 the coping stones were re-caulked and re-waterproofed. The coping stones are 44" wide and as much as 35' long, which is the cast stone application. Coping cast stone is sacking on the top of a concrete block wall and cast stone exterior.

From the overall conditions that were seen, the block wall did absorb moisture and continue to leech moisture into the subsurface of the roof. The samples showed there is water running on the top of the base layer of insulation and not on the concrete deck. The moisture between the layers produce a molding and bloating condition of the facing sheet of the insulation and also produced widespread mold in the bottom layer or the underside surface of the top layer of insulation.

Within the roofing industry, the type of roofing system employed on the building is considered a "closed system". There is no form of venting for moisture to vent from the system and any moisture that has infiltrated into the system is under high temperature condition and produces a thermal movement within the insulation. Isocyanurate insulation boards are isotropic in nature and move laterally and longitudinally at the same general rate. Thermal movement of the isocyanurate insulation board is approximately 30×10^{-6} times the differential in temperature which is 200° , times the feet, times the inches.

From the overall condition seen in Cut #1, a general overall juxtaposed condition of the insulation board produced an overall lap of 1-1/2". In Cut #2 which is approximately 4' away which is the adjacent insulation board, the insulation movement was observed to produce a gap of 3/4". Taking the roof areas that were identified, the general overall thermal movement within the entire length (127') of the system would be 9.1". This dimensional movement can be isolated to a singular location or broken into several movement locations in the insulation stack.

Thermal movement within an enclosed system would be expanded across the length and width of the application. The majority of the thermal movement was seen in the line of water that was migrating throughout the system which migrated from the walls to the drain locations.

It could be determined from the samples and cuts, the water laid onto the top of the top insulation board and not permeated into the concrete deck and produced widespread bloating of the top facing sheet and the bottom facing sheet of the first and second board.

EXHIBIT 'D'

Cut #4 was adjacent to the exterior perimeter where it could be identified that water was leeching down the face of the wall and the concrete deck was saturated. Mold growth continued at the bottom of the insulation panel and throughout all insulation layers.

Cut #5 was at the lower crelation area which was identified in the walls. It should be noted in this particular building, the exterior walls have a high merlon wall section which is identified as a higher elevation and there were keys cut into the walls call crenels that allowed water to migrate into the system. The top of the wall being the merlon and the bottom being the crenel, water migration was seen throughout some portions of the roof.

Roof Areas B and L have total distention of the insulation and the installation being juxtaposed on top of each other could not be repaired without complete replacement of the insulation down to the concrete deck.

It is the recommendation of ARMM Associates to completely remove and replace these specific areas. While the base concrete originally was unsaturated, at this time a vapor barrier should be installed onto the concrete surface and a new tapered insulation system and single ply membrane installed. Water migration into the system has to be resolved at the perimeter.

From further investigation, it is ARMM's belief that all moisture came from the perimeter wall systems not from the roofing membrane. The moisture produced the undulation into the insulation systems and produced the deterioration of the insulation and the juxtaposing of the insulation which produced the lumping and ridging within the insulation field.

At this time the insulation should be removed and replaced and all the EPDM that was placed onto the wall in the roofing application should also be removed. A vapor barrier should be installed onto the concrete surface to eliminate moisture that might come from the concrete substrate or the wall locations.

In 2017 the walls and copings were re-caulked and in ARMM's opinion the re-caulking of the application rectified the water migration that affected the roofing system.

Looking at the timeline, the original re-caulking install was in 2005. The roofing application was completed in 2007. General deterioration of the insulation that was visible was in 2017. From interviews, some lifting occurred by 2012. Re-caulking the walls was in 2017 and the current heavy deterioration of the system occurred within this year 2018.

Within the initial 10 year period that the roof was installed until some conditions are identified as to the ridging and the distress within insulation allowed water to migrate into the system for over a 10-year period and produced a long-term failure. Water migration from the walls would have a long-term effect and have the amount of moisture that was in a closed system to produce the thermal characteristics and thermal changes in movement within the insulation system application.

The "latent defect" of wall moisture migration produced the long term failure of the insulation. It is the professional opinion of ARMM Associates, with all architectural certainty, the two roof areas should be redesigned to bring about a waterproof application with a new tapered insulation system and a vapor barrier secured onto the concrete deck with insulation placed into a two-part polyurethane adhesive application.

EXHIBIT 'D'

WARRANTY DISCUSSION

As part of ARMM's investigation, we contacted the membrane manufacturer Johns Manville for the purposes of reporting ongoing leaks as well as to inform them that roof cuts will be performed by a Johns Manville approved contractor.

In order to properly investigate roof areas where the roof system is now delaminating, roof cuts were required. ARMM contacted Johns Manville warranty department to inform them of the situation and to obtain their approval to use Patriot Roofing to make the actual cuts.

ARMM spoke with Cameron Jenkins (phone number 800-922-5922 #1) of Johns Manville warranty division. Patriot Roofing was subsequently approved by Johns Manville to perform and repair roof cuts. Mr. Jenkins also stated that the warranty would remain in effect.

ARMM informed Mr. Jenkins that leaks have been occurring and that Patriot Roofing is onsite performing repairs. ARMM further stated to Mr. Jenkins that Patriot is patching open lap seams; however, there are openings in pourable sealer pan flashings that Patriot stated was not covered under the Johns Manville warranty. Mr. Jenkins stated that this is incorrect; and that any and all deficiencies that result in a roof leak (i.e.: pourable sealer pans) are in fact covered under the warranty.

ARMM then contacted Alan Seidel, Johns Manville's senior field technical inspector, regarding the delaminated roof system. Mr. Seidel informed ARMM that the manufacturer had taken cuts and found the cause of the delamination was due to open joints in the masonry at the parapet wall which is allowing water to enter the roof system. Mr. Seidel also was confused at why he was not notified about the roof delamination when it was first discovered. Mr. Seidel informed ARMM that he had a conversation with a female worker in the building who informed him that the roof delamination started to occur six (6) years *before* Johns Manville was notified. ARMM cannot confirm or deny when the delamination occurred as we were not notified until April of 2018.

CONCLUSIONS

With the exception of Roof Areas B and L, ARMM found the EPDM (Ethylene Propylene Diene Monomer) system on the remaining areas to be in fair condition. In ARMM's opinion, with recommended repairs, these areas should provide a serviceable life for another nine (9) to ten (10) years.

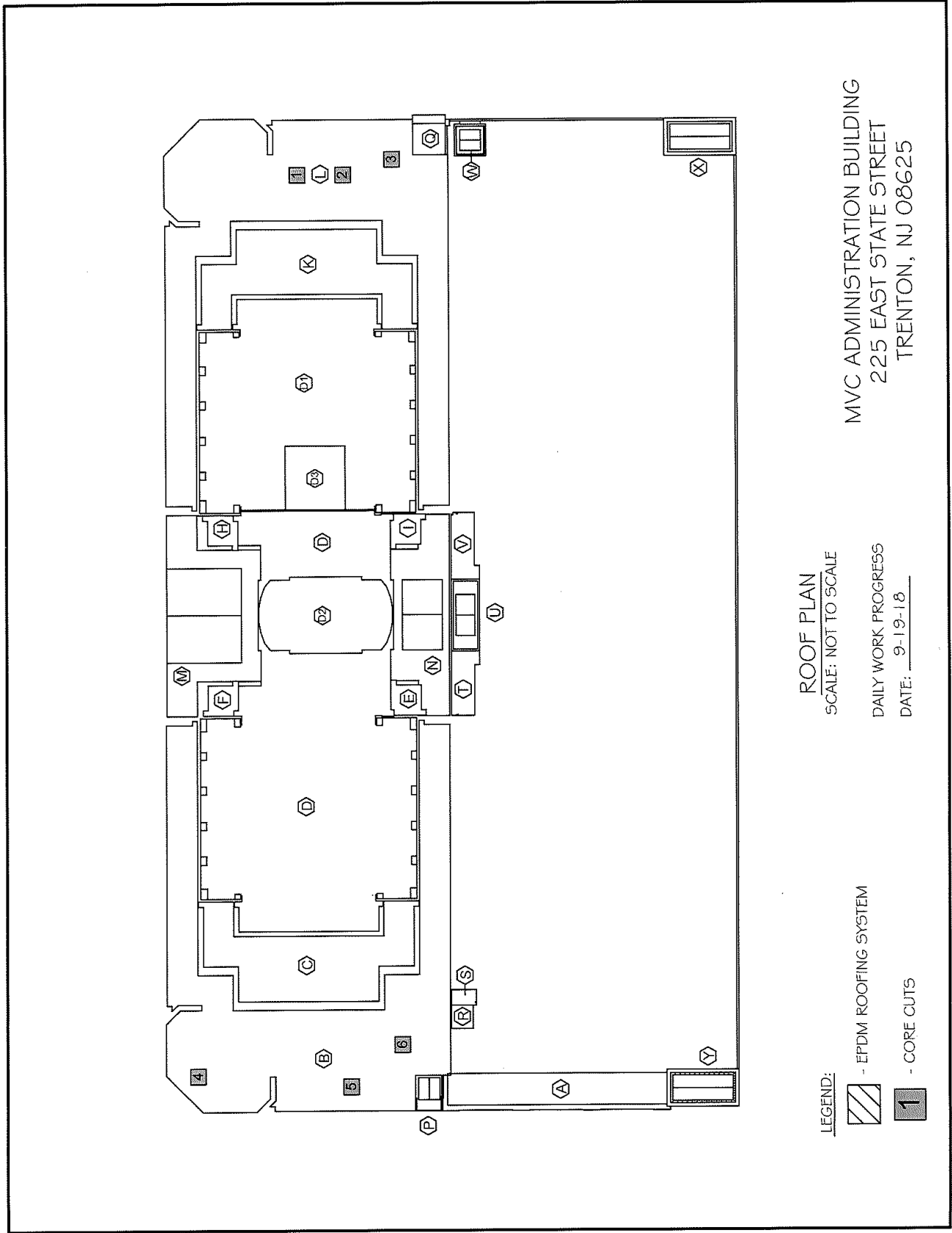
Small delaminated sections on Roof Areas C, D1, D2 and K must be repaired by attaching the raised insulation with batten strips to the concrete deck. Each batten strip will be stripped to provide a watertight condition. Appendix A of this report is information on Johns Manville batten strips.

Based on the results of our inspections and analysis of roof cuts samples, the existing roof system at Roof Areas B and L requires total removal and replacement down to the surface of the concrete deck substrates.

In addition to the roof, existing window and skylight glazing is dry rotting. Numerous repairs have been made indicating probable on-going leak locations.

On the top layer of the parking garage where the elevator/stairwell extensions of the building meet the main building, the existing expansion joint material is degraded. No leaks were reported; however if this condition is not addressed, problems will occur.

There was no access to Roof Areas X and Y. When a contractor comes on-site to make the repairs indicated in this report, they should inspect and make necessary repairs, if any, at that time.



MVC ADMINISTRATION BUILDING
 225 EAST STATE STREET
 TRENTON, NJ 08625

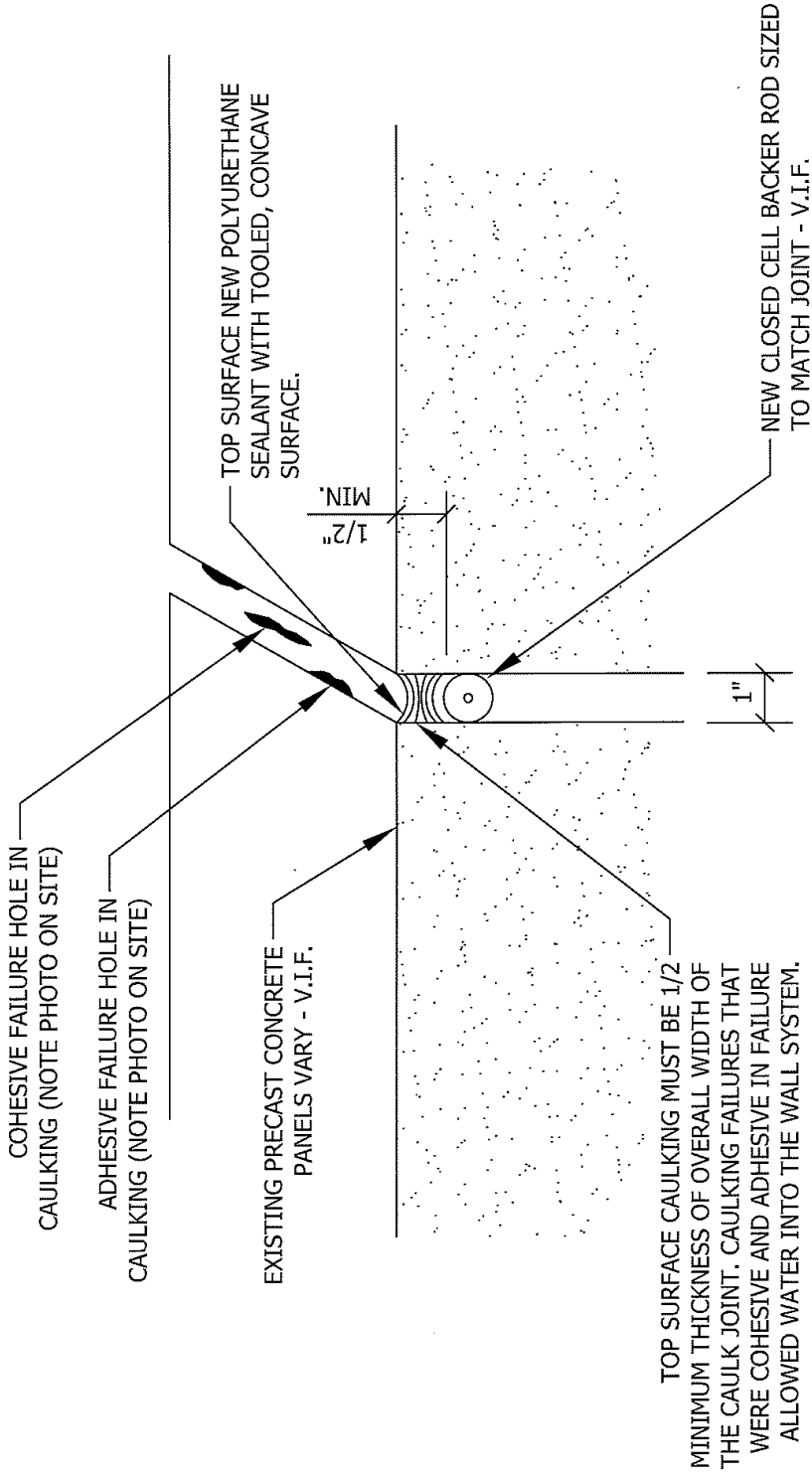
ROOF PLAN
 SCALE: NOT TO SCALE


DAILY WORK PROGRESS
 DATE: 9-19-18

LEGEND:
 - EPDM ROOFING SYSTEM
 - CORE CUTS

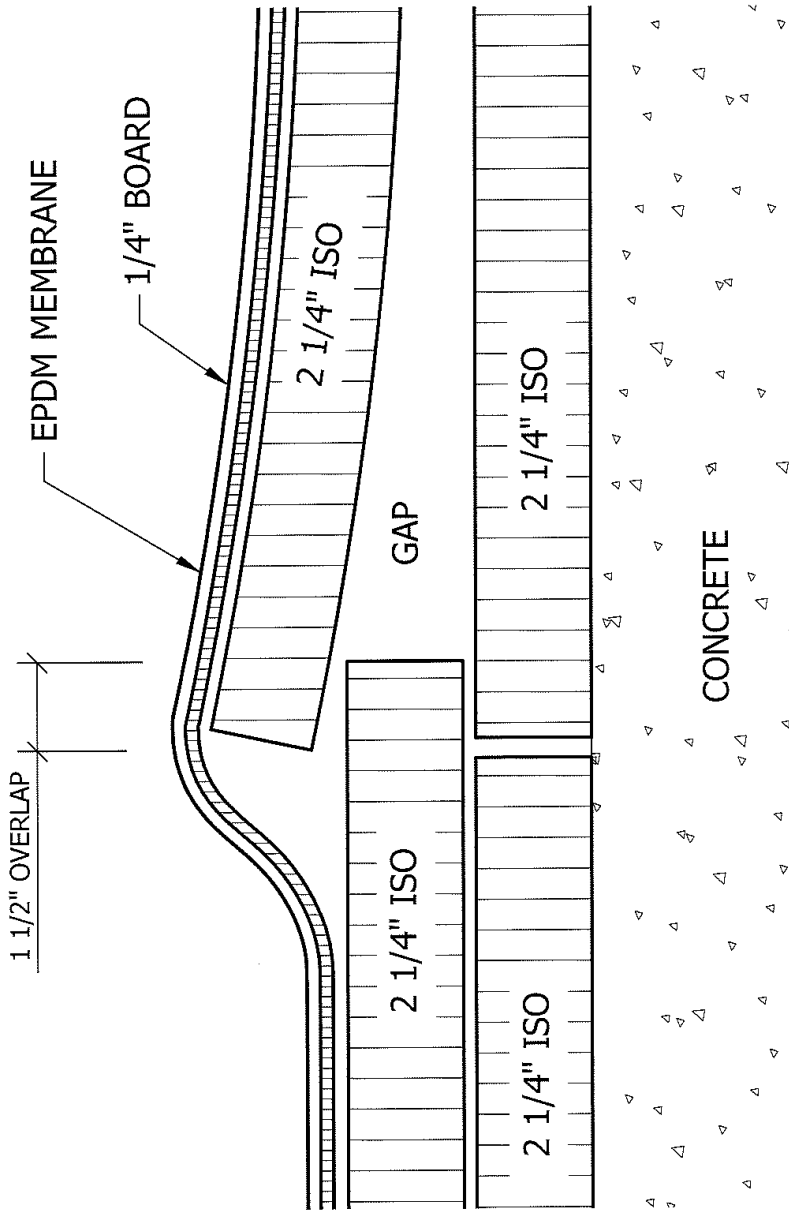
EXHIBIT 'D'

PRECAST PANEL JOINT



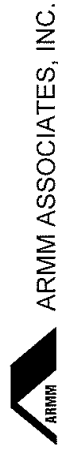
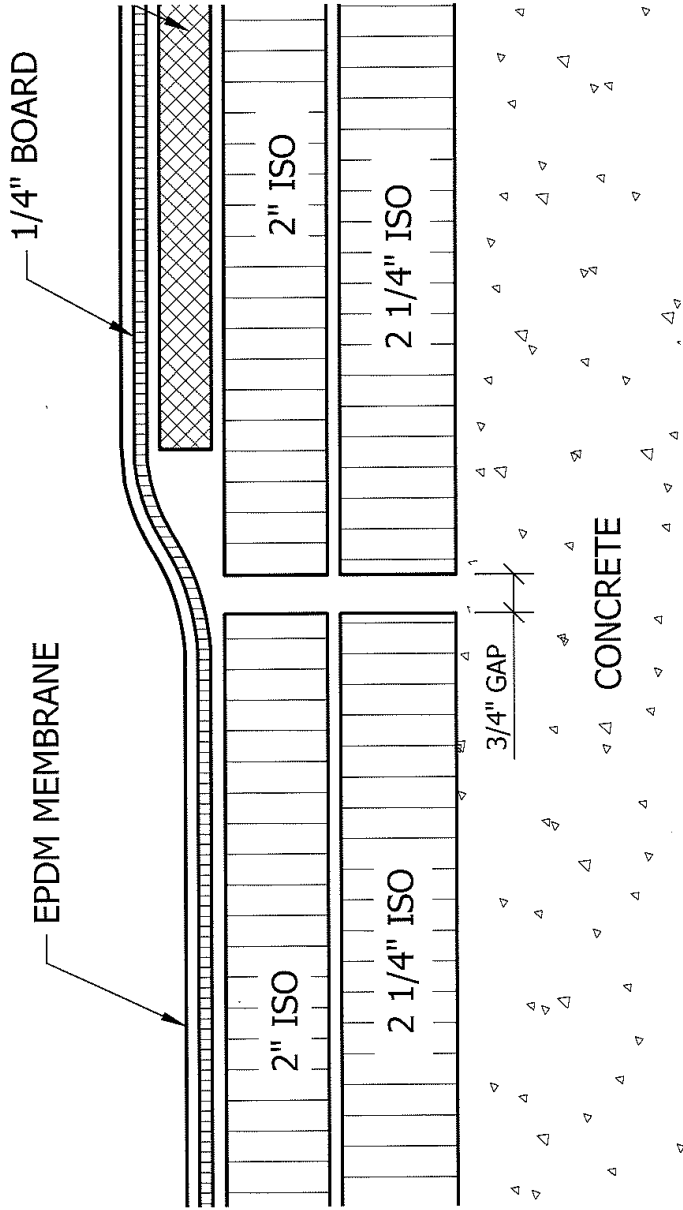
 ARMM ASSOCIATES, INC.
725 Kenilworth Ave. • Cherry Hill, NJ 08002-2829
Phone 856-665-8484 • Fax 856-665-5235

CORE CUT #1
CLOSED SYSTEM



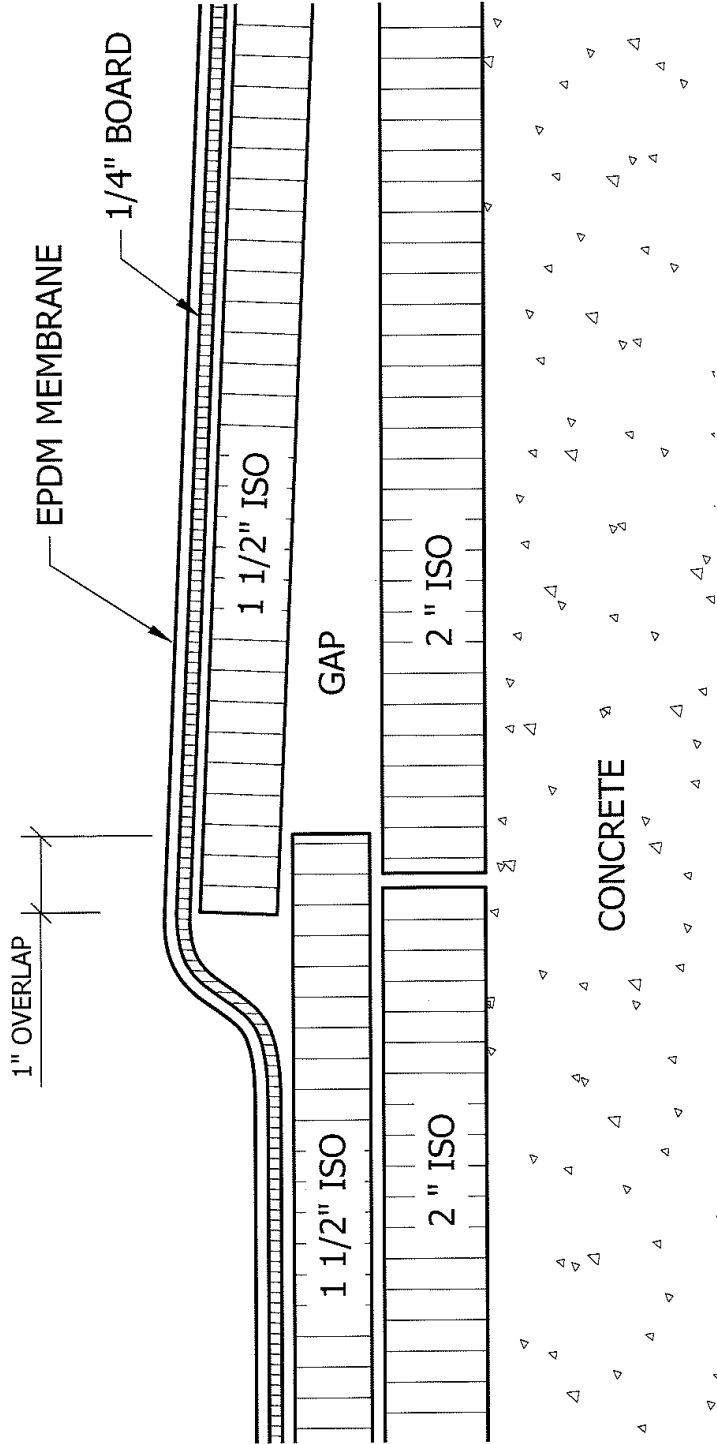
725 Kenilworth Ave. • Cherry Hill, NJ 08002-2829
Phone 856-665-8484 • Fax 856-665-5255

CORE CUT #2
CLOSED SYSTEM



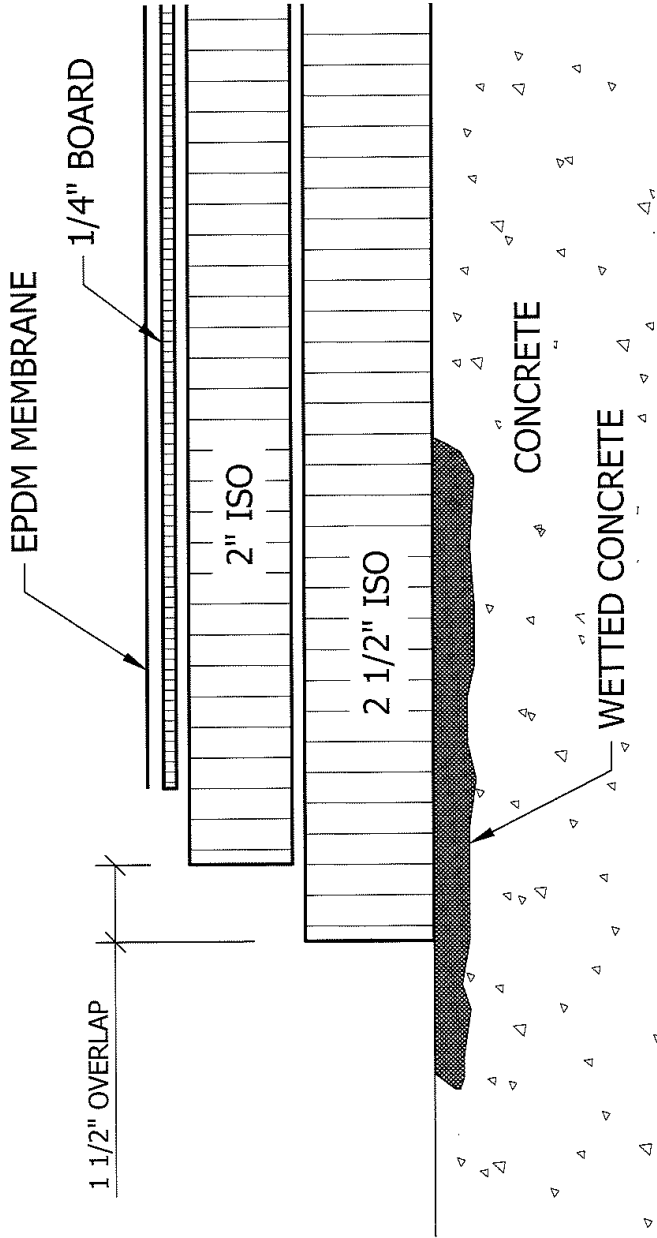
725 Kenilworth Ave. • Cherry Hill, NJ 08002-2829
Phone 856-665-8484 • Fax 856-665-5255

CORE CUT #3
CLOSED SYSTEM



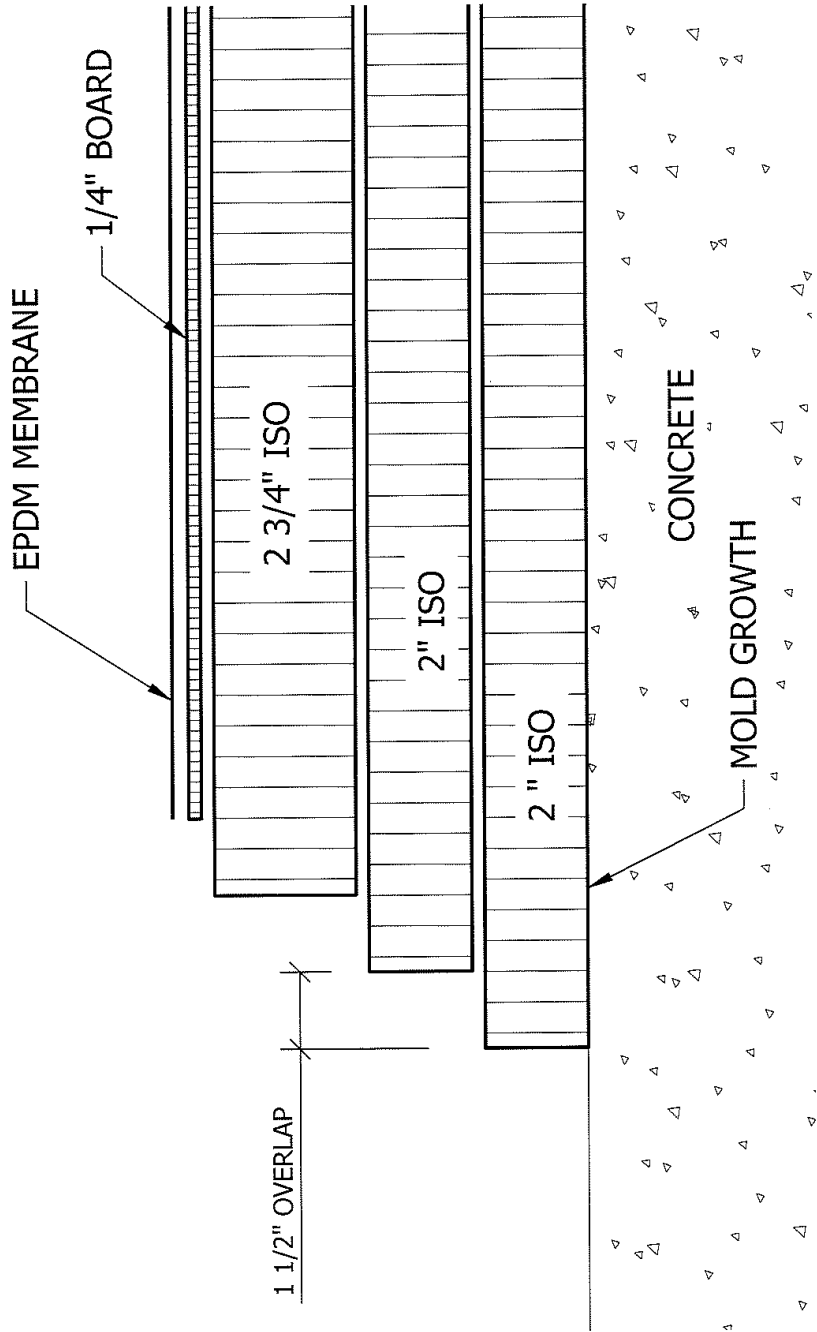
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Phone 856-665-8484 • Fax 856-665-5255

CORE CUT #4
CLOSED SYSTEM



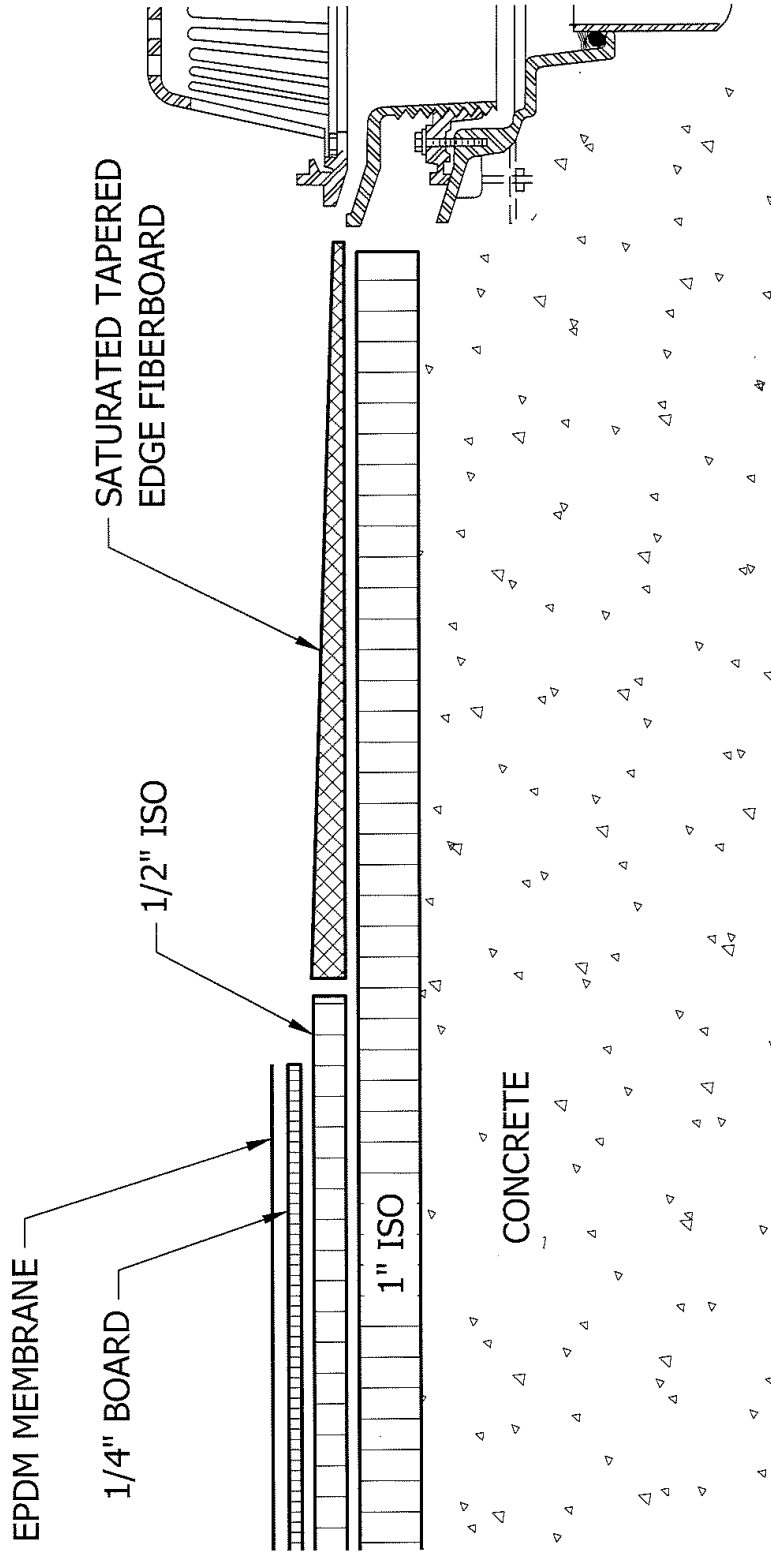
725 Kenilworth Ave. • Cherry Hill, NJ 08002-2829
Phone 856-665-8484 • Fax 856-665-5255

CORE CUT #5
CLOSED SYSTEM



725 Kenilworth Ave. • Cherry Hill, NJ 08002-2829
Phone 856-665-8484 • Fax 856-665-5255

CORE CUT #6
CLOSED SYSTEM



ARMM ASSOCIATES, INC.

725 Kenilworth Ave. • Cherry Hill, NJ 08002-2829
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RECOMMENDATIONS

It is the opinion of ARMM Associates, Inc. That the existing EPDM roof system with repairs should reach its expected life expectancy of twenty (20) years.

On Roof Areas D, D1, D3 and L, there are holes and/ or splits in the EPDM membrane that must be repaired (see enclosed roof plan for locations). Prior to making a repair, it is recommended that a two (2) foot by two (2) foot cut be taken at each hole to check for wet material and/or water in the system. Remove all wet material in all directions until you hit dry. Remove additional wet material if required, install new insulation and EPDM membrane.

At Roof Areas B, C, D1, D2, K and L the roof system has completely delaminated from the surface of concrete deck substrate. Due to the extent of the delamination, ARMM cannot recommend repairs to these areas as the existing insulation is saturated with water found on the surface of the concrete deck. In addition, during roof sampling performed by Patriot Roofing on September 19, 2018, ARMM observed that the insulation boards have overlapped each other in various sections of Roof Areas B, C, D1, D2, K and L.

On all roof areas, provide patches to all delaminated vertical open lap seams, delaminating patches, etc. See enclosed roof plan for locations.

On Roof Area D, a section of the perimeter drip edge located below the north end of Roof Area D2 is damaged. It appears that the cause was from high winds. Remove and replace with new aluminum drip edge, approximately 30 linear feet.

Remove and replace all pourable sealer pocket flashings on curtain wall "I" beam supports and all pourable sealer pocket flashings on HVAC equipment lines and supports. All penetrations must be wire brushed or sanded to remove existing rust and existing material. Prime all penetrations and the new pourable sealer pocket prior to installing the pourable sealer.

Remove all pipe wrap flashings on curtain wall pipe supports, wire brush and sand all rust and existing roof material from the base of the pipe. Prime pipe and install new EPDM pipe wrapping. At the top leading edge, provide water cut off and a metal pipe band.

On Roof Area D1, there is a hole in the exterior stucco wall leading up to Roof Area D3.

Roof Area X and Y, there was no access to these areas. Based on information that I received from in house personnel, Phil, the manufacturer of the roof system (Johns Manville) has Patriot Roofing making repairs to open lap seams. Have Patriot Roofing look at these two (2) roof areas. More than likely, the only repairs necessary would be open lap seams or delaminating patches.

ESTIMATED CONSTRUCTION COST

It is important to note that leaks are in fact occurring underneath and around warranted items. For example, pitch pockets have clear openings within same which leaks have been reported underneath. For these items, Johns Manville must provide a contractor to repair and stop the leaks.

There are areas where the EPDM roof system is delaminated and Johns Manville is stating that this delamination is not covered under their warranty due to the fact that the delamination is caused by wall issues.

To repair areas of delamination with batten strips (see plan on following page) at Areas C, D1, K and M, a contractor approved by Johns Manville must be contracted. Basic repair methods would be as follows:

1. Open the EPDM membrane for access to the insulation.
2. Rearrange or cut existing insulation to flatten and repair opening.
3. Provide rows of batten strips fastened through the existing roof system into the concrete deck and strip the batten strips.

Roof Area	Total Square Feet	Remedial Action
B	8,149	Removal and replacement
C	50	Batten strips
D1	108	Batten strips
K	400	Batten strips
L	8,149	Removal and replacement
M	20	Batten strips.

Repair existing delaminating lap seams and patches. Locations marked on the roof surface and on the enclosed roof plan. There are approximately 105 patches that need to be installed / replaced. It is ARMM's understanding that the patches are being performed under the Johns Manville Warranty.

Remove and replace all pourable sealer pan flashings on the "I" beam curtain wall supports and HVAC equipment lines on Roof Areas D and D1. It is ARMM's understanding that leaks are occurring near some of these areas; if leaking, Johns Manville will cover the cost for repairs to same.

Curtain Wall Round Pipe Supports: Remove and replace the existing EPDM pipe wrapping where the pipes penetrate the roof system. Remove all rust and debris, prime each pipe and install new EPDM wrapping, provide water cut-off and a metal pipe band at the top leading edge. 24 pipes @ \$125.00 per pipe = \$3,000.00.

There are ten (10) pourable sealer pans located at HVAC units that are not suspect to leaks. ARMM recommends that these be repaired before leaks develop.

There are forty (40) pourable sealer pans located at the curtain Wall "I" Beam supports. ARMM recommends that these be repaired before leaks develop.

Replace thirty (30) linear feet of drip edge: \$1500.00

Removal and replacement at Areas B and L is estimated to cost **\$480,000.00**.

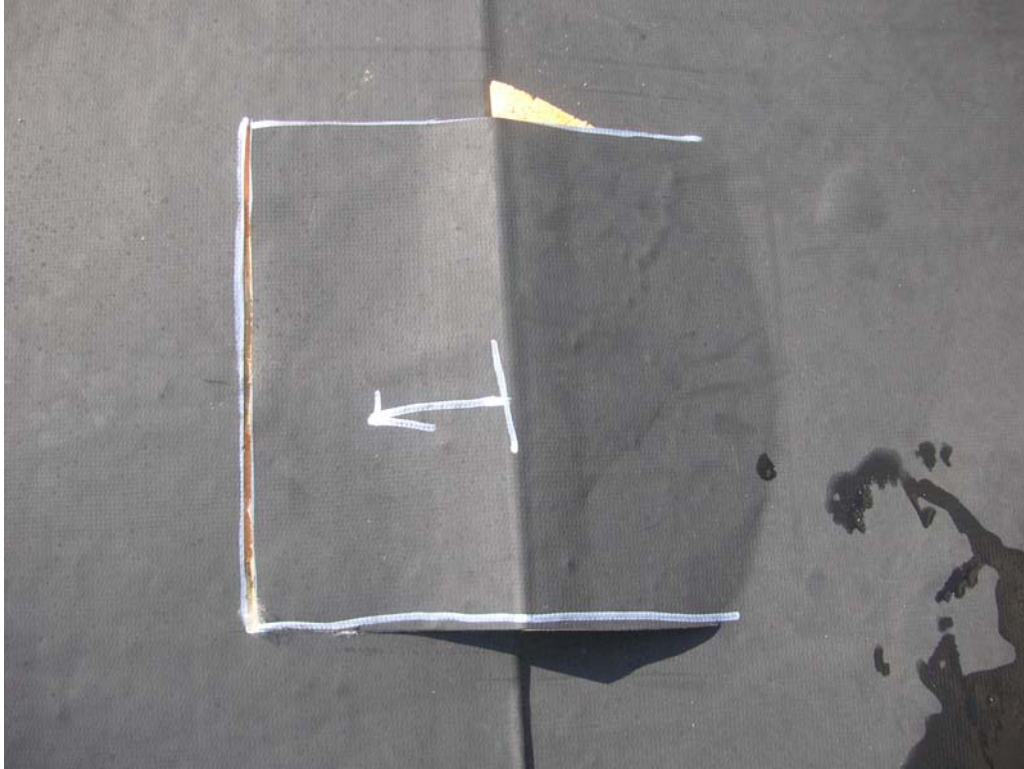
EXHIBIT 'D'

PHOTOGRAPHS FROM ROOF CUTS

taken on

SEPTEMBER 19, 2018

EXHIBIT 'D'



1. Cut #1 – Note Roof Plan



2. 1/4" hard board – good attachment to EPDM

EXHIBIT 'D'



3. Top layer of insulation riding over the adjacent layer



4. Top layer removed

EXHIBIT 'D'



5. Bottom layer to concrete deck



6. Mold in under side of top layer of insulation; facing sheet bloated from moisture

EXHIBIT 'D'



7. Bottom layer removed to concrete deck



8. 1.5" overlay of board; board is juxtaposed to adjacent board

EXHIBIT 'D'



9. Gap under 1/4" hard board



10. 2" gap under hard board

EXHIBIT 'D'



11. Juxtaposed insulation board

EXHIBIT 'D'



12. Open gap under board

EXHIBIT 'D'



13. Good attachment of insulation to insulation interface



14. Mold growth on underside of top layer of insulation

EXHIBIT 'D'



15. Board was deformed by thermal movement



16. Good attachment between insulation that sheared

EXHIBIT 'D'



17. Cut #2 – Note Roof Plan



18. Top of 1/4" hard board

EXHIBIT 'D'



19. Good attachment of hard board to insulation



20. Top layer removed; good attachment to base board

EXHIBIT 'D'



21. Underside of top layer



22. Bottom layer with good attachment

EXHIBIT 'D'



23. Base layer cut away; good attachment to concrete substrate



24. Shear of adhesive as movement of thermal stack

EXHIBIT 'D'



25. Bloating of facing sheet due to moisture

EXHIBIT 'D'



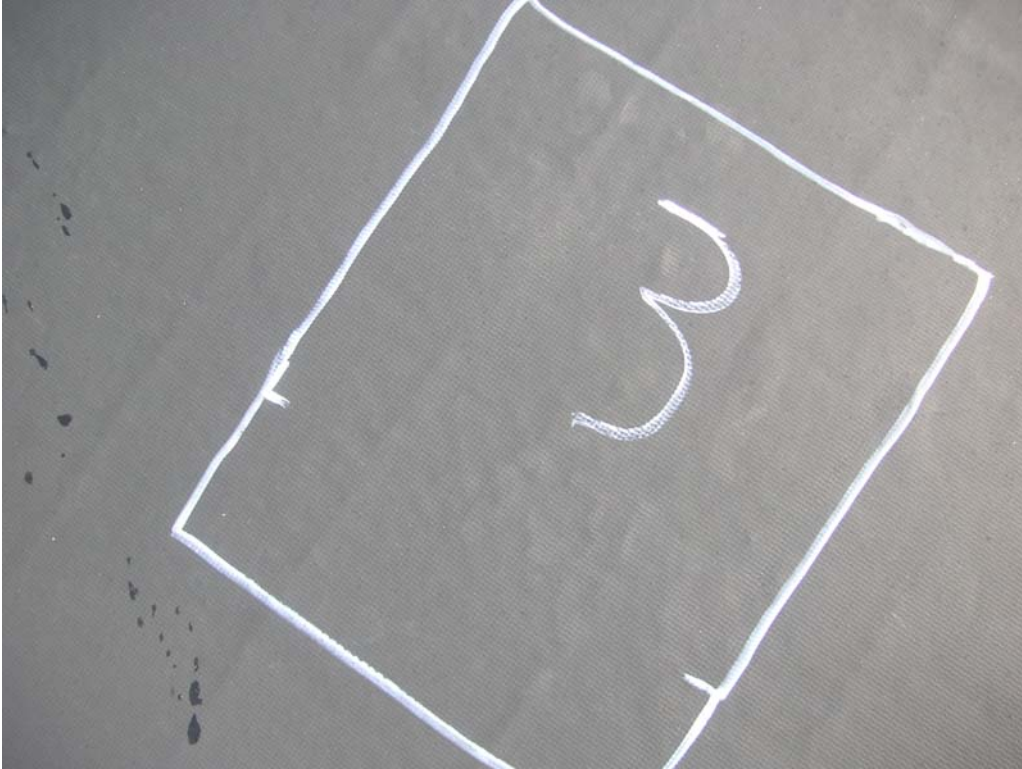
26. Composite is 3-1/4" thick

EXHIBIT 'D'



27. Board movement of the thermal stack is $\frac{3}{4}$ " to place the juxtaposed board by $1\frac{1}{2}$ "

EXHIBIT 'D'



28. Cut #3 – Note Roof Plan

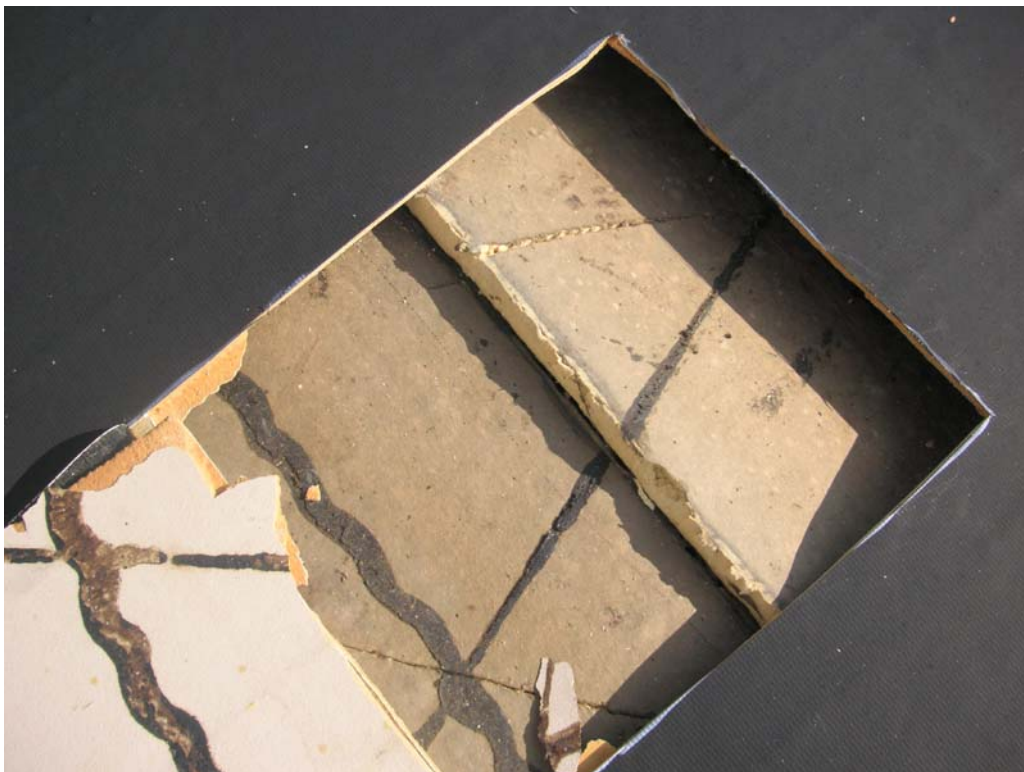


29. Good attachment of membrane to hard board

EXHIBIT 'D'



30. Bottom of hard board showing adhesive line – 8" apart



31. Top board of isocyanurate insulation board has over-ridden bottom board

EXHIBIT 'D'



32. Forced gap is 1-1/4"



33. Full attachment as to manufacturer's recommendations at 10" for interface

EXHIBIT 'D'



34. Good attachment to base board



35. 4" rise of membrane and hard board

EXHIBIT 'D'



36. 2" gap

EXHIBIT 'D'



37. Concrete is dry to the touch which is 20% or less

EXHIBIT 'D'



38. Underside of top insulation board has moisture damage



39. Roof overview

EXHIBIT 'D'



40. Large hump in the membrane

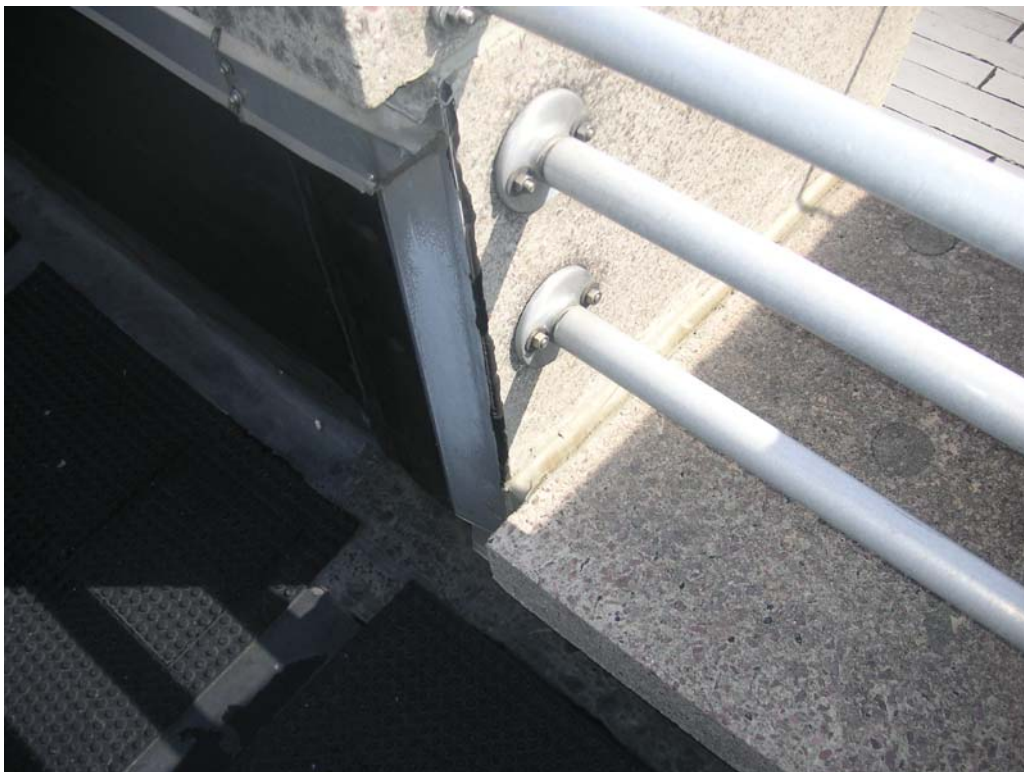


41. View of long leg of the building roof

EXHIBIT 'D'



42. Cut-out is called a “crenel”, which is the bottom section of a merlon and crenel



43. Membrane termination with bars

EXHIBIT 'D'



44. View of counterflashing detail at bottom of crenel

EXHIBIT 'D'



45. Caulk joint at crenel section

EXHIBIT 'D'



46. Top of caulking for cast stone

EXHIBIT 'D'



47. Caulking above cast stone and counterflashing

EXHIBIT 'D'



48. Caulking at cast stone – note cracks in stone



49. Constant drainage point for stone

EXHIBIT 'D'



50. Constant overflow of water over counterflashing

EXHIBIT 'D'



51. Top re-facing of stone for caulk

EXHIBIT 'D'



52. Leakage point for wall systems



53. Overview

EXHIBIT 'D'



54. Large deformation in membrane



55. Ponding due to deformation

EXHIBIT 'D'



56. Long leg of roof system



57. Crenel sections that leaked

EXHIBIT 'D'



58. Extensive leakage at wall and metal connections

EXHIBIT 'D'



59. Constant leaking of water from stone work

EXHIBIT 'D'



60. North leg of building



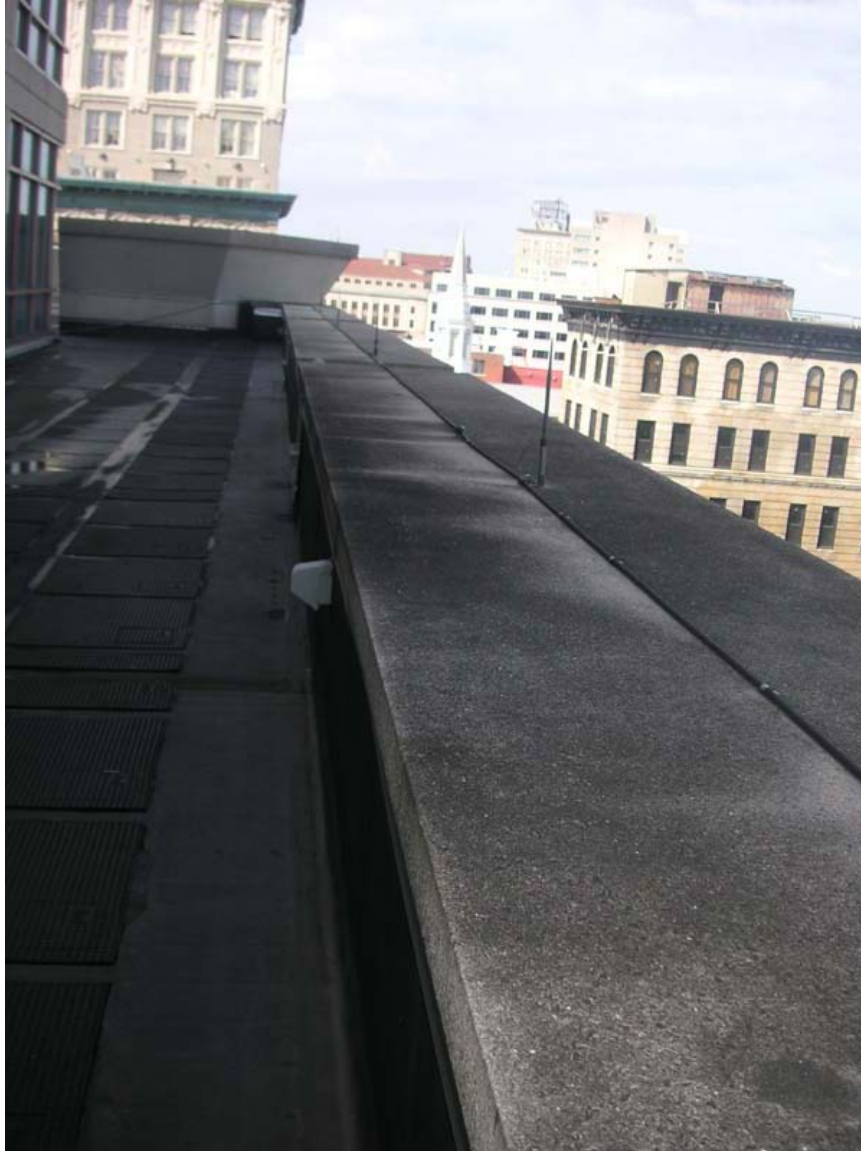
61. Mold

EXHIBIT 'D'



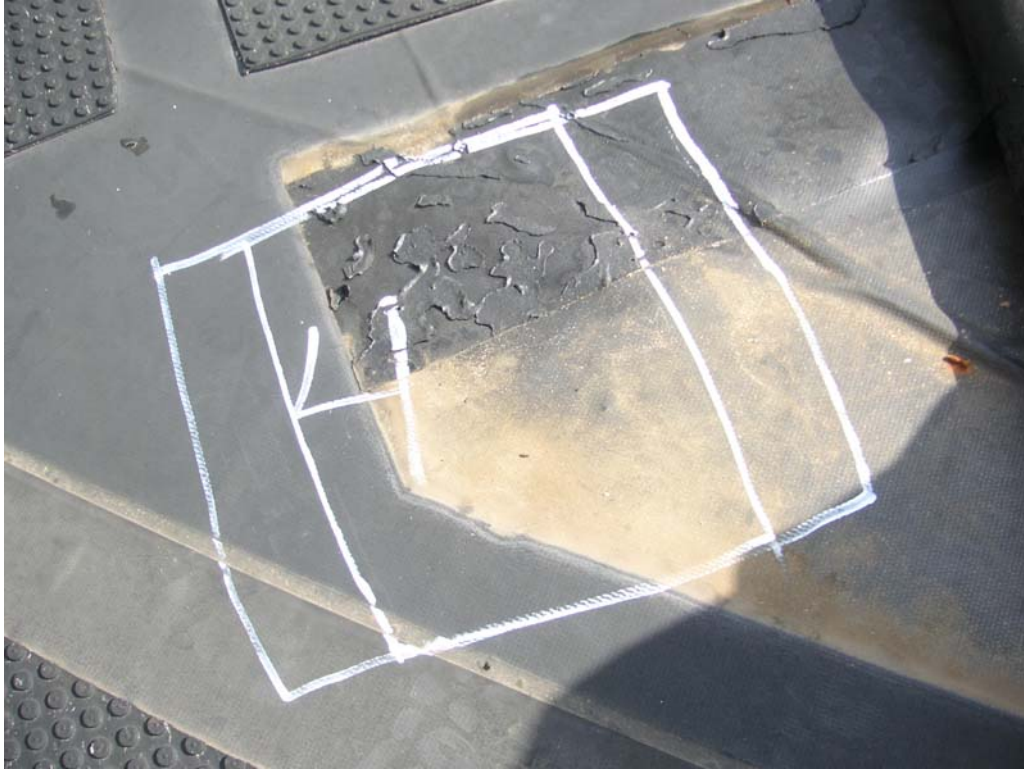
62. Lack of maintenance

EXHIBIT 'D'

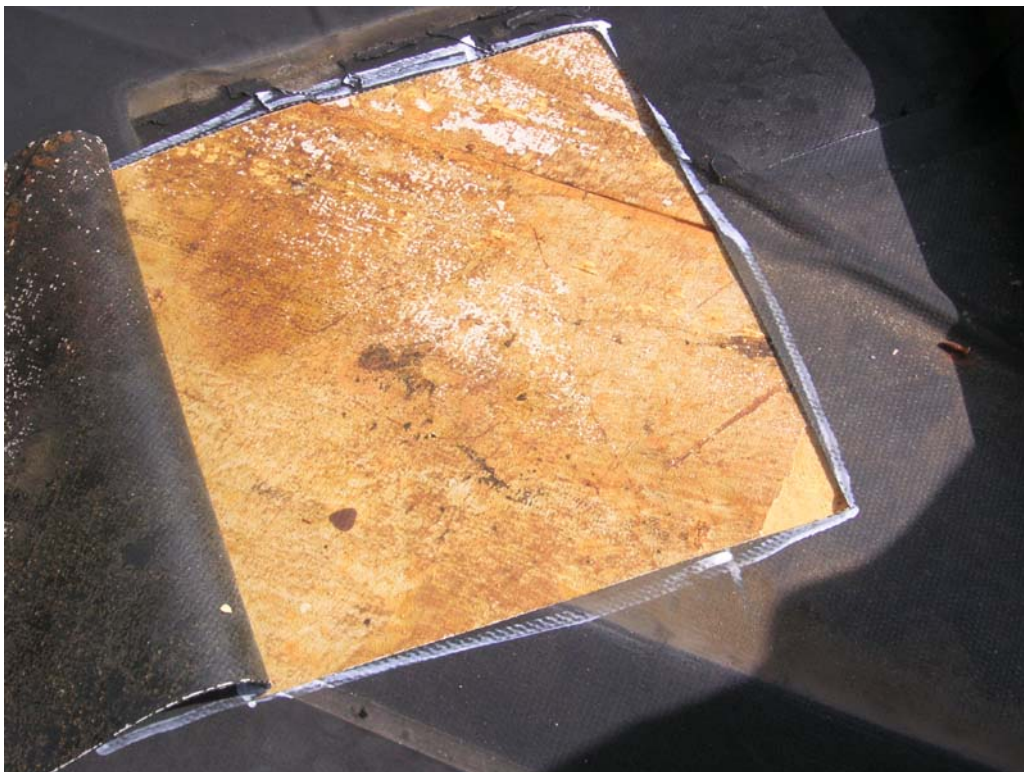


63. Cast stone is 44" wide by 35' long

EXHIBIT 'D'



64. Cut #4 – Note Roof Plan

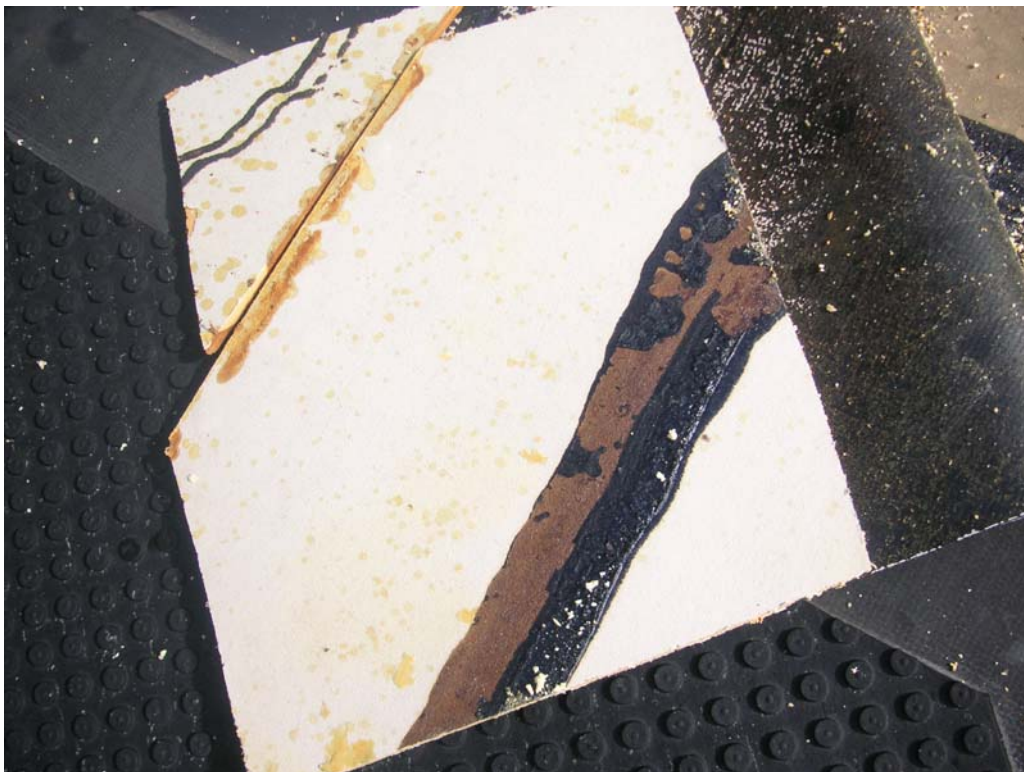


65. Removed membrane showing the top of 1/4" hard board

EXHIBIT 'D'



66. Good attachment of hard board; note mold spores

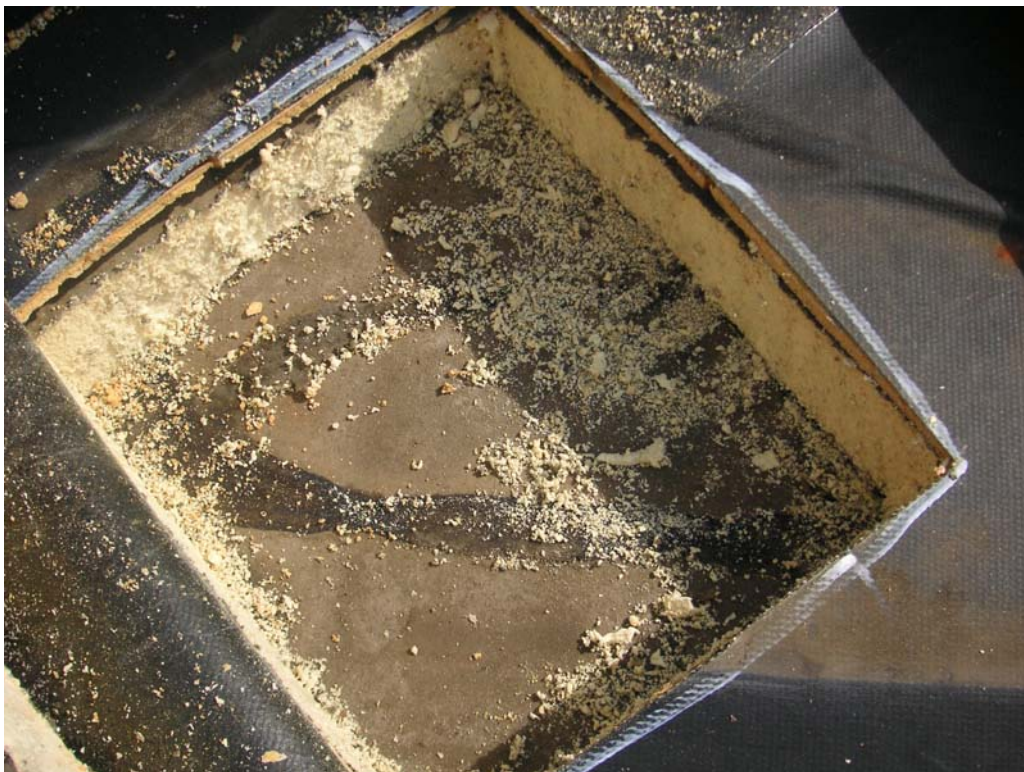


67. Underside of hard board

EXHIBIT 'D'



68. Shear top board of insulation



69. Bottom panel

EXHIBIT 'D'



70. Underside of bottom layer of board



71. Saturated concrete deck

EXHIBIT 'D'



72. Total insulation with 3" delamination

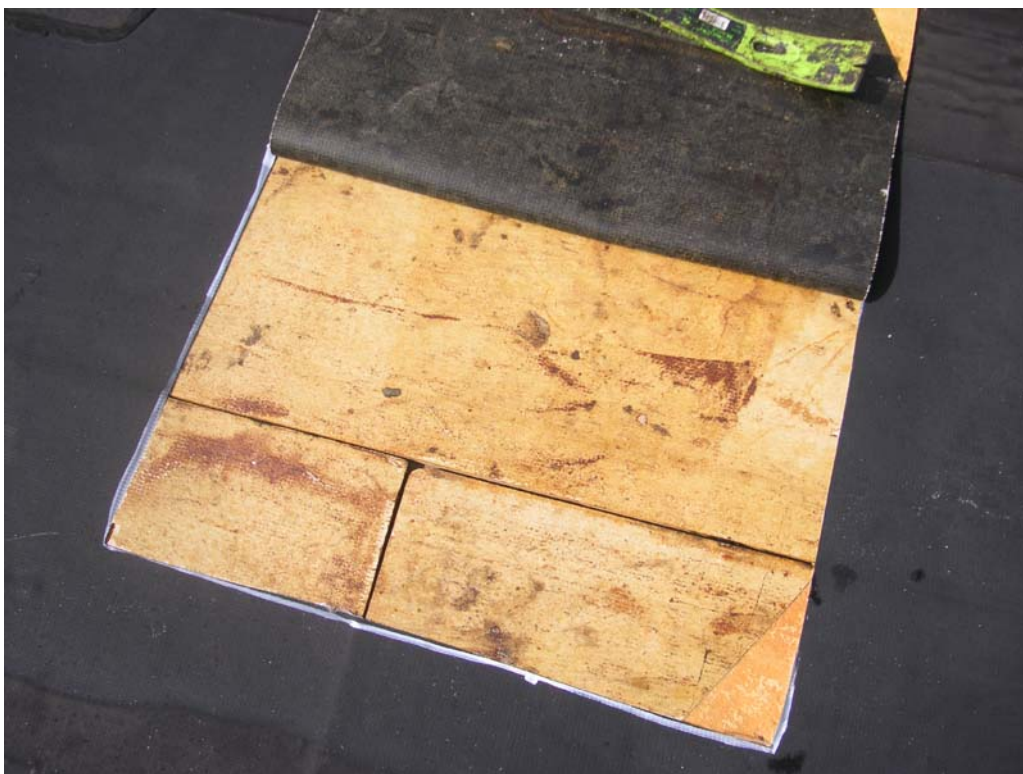


73. 4-1/2" of insulation

EXHIBIT 'D'



74. Cut #5 – Note Roof Plan

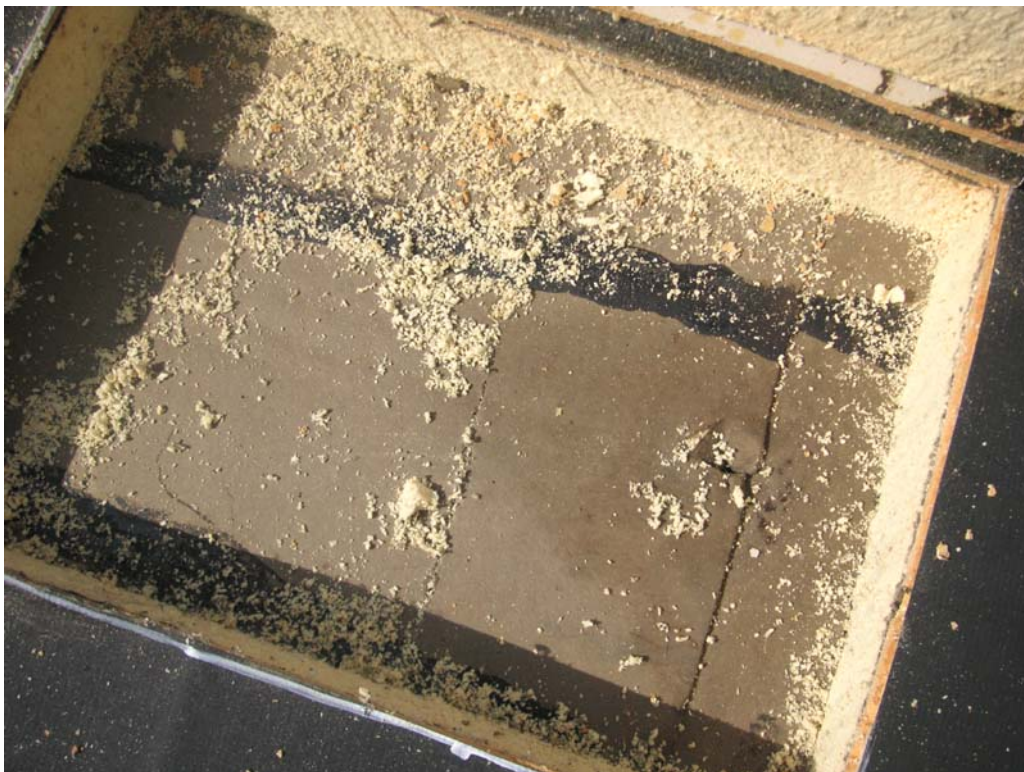


75. Top of hard board

EXHIBIT 'D'



76. Attachment of hard board to base insulation



77. Good attachment of top layer insulation

EXHIBIT 'D'



78. Wet facing sheet



79. Good attachment of insulation layers

EXHIBIT 'D'



80. Top of bottom layer



81. Concrete deck

EXHIBIT 'D'



82. Bottom of insulation wetted with bloated facing sheet and mold throughout

EXHIBIT 'D'

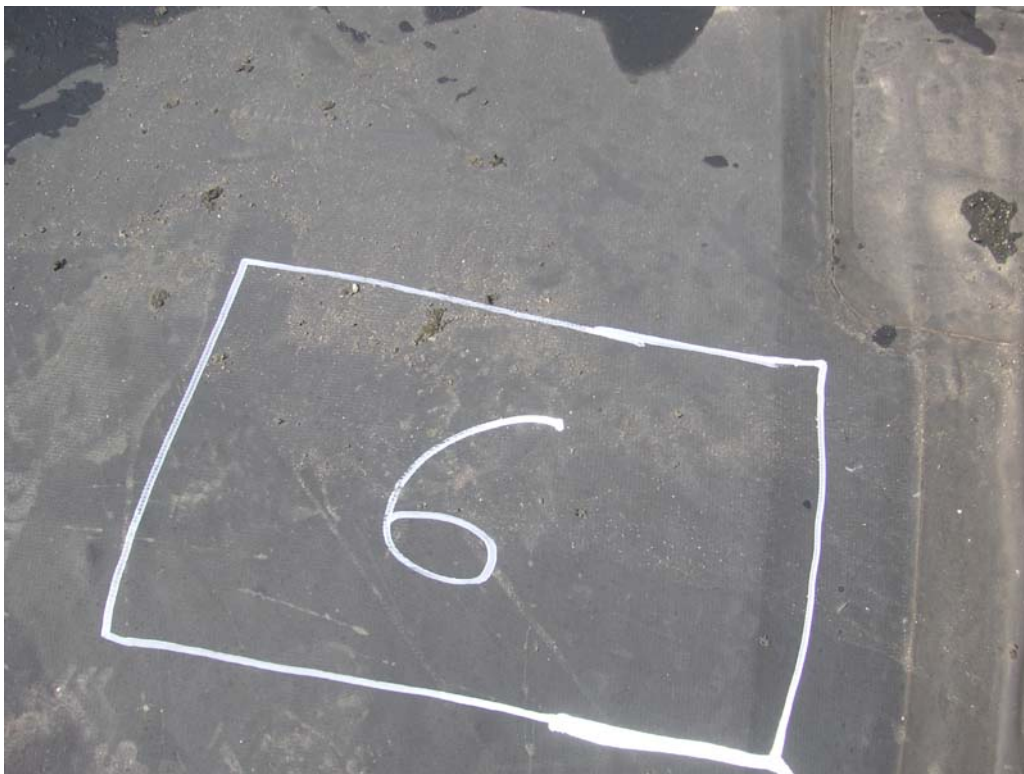


83. Total composite 7"

EXHIBIT 'D'

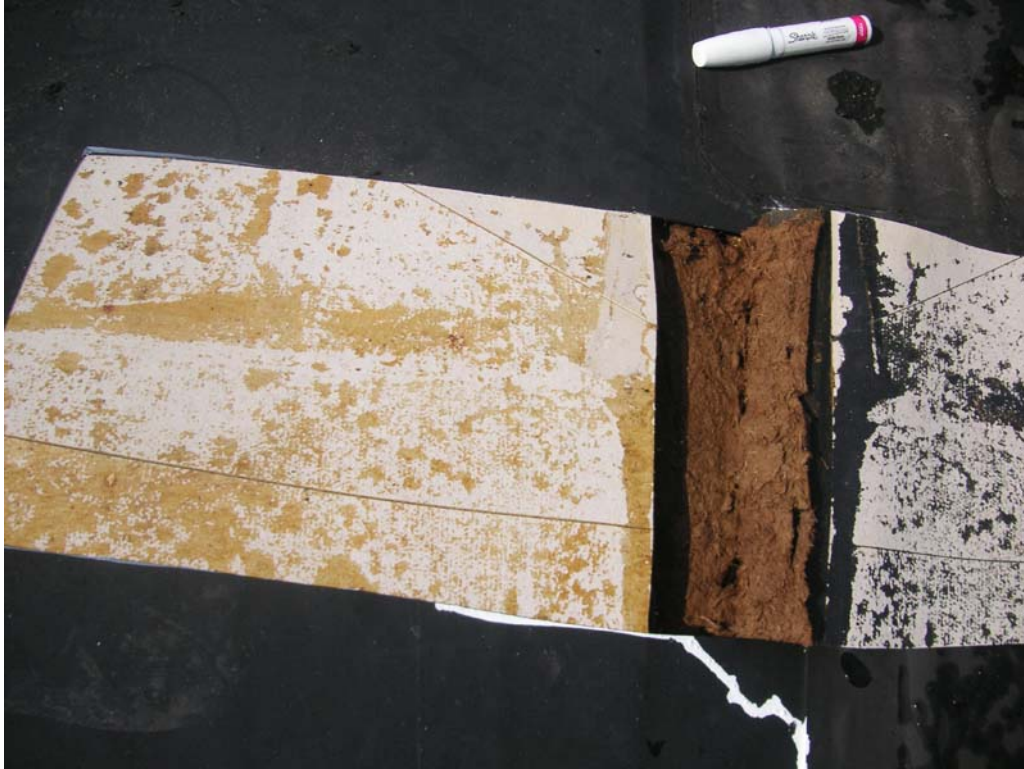


84. Sample removed



85. Sample #6 – Note Roof Plan

EXHIBIT 'D'



86. Cut adjacent to drain; note saturated fiberboard



87. Top board with adhesive

EXHIBIT 'D'



88. Mold spores bottom of 1st board



89. Bloated facing sheet of 2nd board

EXHIBIT 'D'



90. 4" heave in insulation



91. Total composite at drain

EXHIBIT 'D'



92. Flowering mold spores on facing sheet

PHOTOGRAPHS FROM JOHNS MANVILLE

DATE: CIRCA POSSIBLY 2017

EXHIBIT 'D'

The following photographs were provided to ARMM by Johns Manville's representative. The date these photos were taken is unknown; however, it was estimated to be around mid-summer 2017.



1. Caulking at coping stones.
Voids in the caulk joint. Not enough caulk was placed into the joint to cover the neoprene roving.
Caulking by spec is 1/2 of joint width.



2. Caulking at coping stones.
Split at end of caulk joint on exterior of building.

EXHIBIT 'D'



3. Caulking at coping stones.
Multiple openings in joint allowing water into system.



4. Caulking at coping stones.
Expansion of joint over width as cohesive failure of caulk.

EXHIBIT 'D'



5. Coping.
All stone work is sloped back to the roof surface. Splits in the side shoulder of the caulk joint allow water to migrate into the system.



6. Coping
Cast stone is 44" wide. Gaps and blistering in joint allows water to migrate on top of the roving and into the block wall of the concrete deck.

EXHIBIT 'D'



7. Coping



8. Coping
Split in caulk at shoulder of cast stone.

EXHIBIT 'D'



9. Caulking at Windows.



10. Caulking at Windows.
Original caulk 31 years ago never removed to allow water intrusion to base of system

EXHIBIT 'D'



11. Caulking at Windows.
Limited overlap in metal to prevent water migration into system



12. Caulking at Windows.
No backer rod behind metal sill plate of window

EXHIBIT 'D'



13. Ridging Points.
Lifting plug not secured or waterproofed allowing moisture intrusion. Cast stone mortar installed after cast plank installation.



14. Caulking at Windows.
Remedial efforts with open joint.

EXHIBIT 'D'

APPENDIX A

JOHNS MANVILLE MEMBRANE BATTENS CATALOG CUT

EXHIBIT 'D'



MEMBRANE BATTENS

Single Ply Membrane Fastening System

Features and Components

Polymer Batten Strips are 1" (2.54 cm) wide, approximately .050" (1.27 mm) thick, plastic strips, prepunched 6" (15.24 cm) on center.

Anchor Bars are 1" (2.54 cm) wide, prepunched and counter-sunk, Galvalume®-coated steel strips.

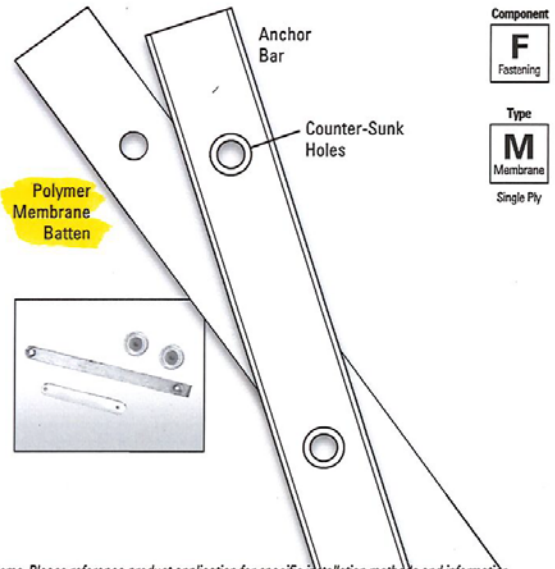
Use: Single Ply Membranes

Materials: Battens - Polymer
Anchor Bars - Galvalume-Coated Steel

Color: Battens - White
Anchor Bars - Grey

Deck Types: Steel, Wood and Structural Concrete

* Galvalume is a registered trademark of BIEC International, Inc. and some of its licensed producers.



System Compatibility This product may be used as a component in the following systems. Please reference product application for specific installation methods and information.

Multi-Ply	BUR	APP	SBS					
	HA CA	CA HW	HA	CA	HW	CA	MF	
Do not use in Multi-Ply systems								

Single Ply	TPO		PVC		EPDM		
	MF	FA	MF	FA	MF	FA	BA
Use to fasten Membranes the selected Single Ply systems above							

Key: HA = Hot Applied CA = Cold Applied HW = Heat Weldable SA = Self Adhered MF = Mechanically Fastened FA = Fully Adhered BA = Ballasted

Energy and the Environment

Recycled Content	This steel based product contains a minimum of 25% post consumer recycled materials by weight
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Peak Advantage® Guarantee Information

Systems
Approved to use in any Peak Advantage Guarantee

Codes and Approvals*



*Fastener approvals are based on system approvals

Installation/Application

Polymer Batten Bar: dispense from the carton. Install in straight lines by anchoring one end and extending bar to 25-ft. or so, then anchoring again. Set fastener head flush with batten bar. Do not overdrive.

Anchor Bar: Use appropriate fastener. Set fastener head flush with anchor bar.

Packaging and Dimensions

Item	Sizes	Length/Container
Polymer Batten Strip	1" (2.54 cm) wide .05" (1.27 mm) thick	250' (76.2 m)/carton
Anchor Bars	1" (2.54 cm) wide 10' (3.05 m) length	500'/carton
Producing Locations*	Agawam, MA and Itasca, IL	

* The point of manufacture for fasteners and plates varies depending on the specific part. Call your local JM sales professional for assistance.

Refer to the Safety Data Sheet and product label prior to using this product. The Safety Data Sheet is available by calling (800) 922-5922 or on the Web at www.jm.com/roofing.

RS-8074 2-17 (Replaces 8-15)