

# **SCOPE OF WORK**

## **Roof Replacement**

Records Storage Center & Library for the Blind and Handicapped  
West Trenton, Mercer County, N.J.

**PROJECT NO. A1231-00**

**STATE OF NEW JERSEY**

Honorable Chris Christie, Governor  
Honorable Kim Guadagno, Lt. Governor

**DEPARTMENT OF THE TREASURY**

Robert A. Romano, Acting Treasurer



**DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION**

Steven Sutkin, Director

**Date: September 23, 2015**

## TABLE OF CONTENTS

| SECTION   | PAGE      |
|---|-----------|
| <b>I. OBJECTIVE .....</b>                                     | <b>7</b>  |
| <b>II. CONSULTANT QUALIFICATIONS .....</b>                    | <b>7</b>  |
| A. CONSULTANT & SUB-CONSULTANT PRE-QUALIFICATIONS .....       | 7         |
| <b>III. PROJECT BUDGET .....</b>                              | <b>7</b>  |
| A. CONSTRUCTION COST ESTIMATE (CCE) .....                     | 7         |
| B. CURRENT WORKING ESTIMATE (CWE) .....                       | 8         |
| C. CONSULTANT'S FEES .....                                    | 8         |
| <b>IV. PROJECT SCHEDULE .....</b>                             | <b>8</b>  |
| A. SCOPE OF WORK DESIGN & CONSTRUCTION SCHEDULE .....         | 8         |
| B. CONSULTANT'S PROPOSED DESIGN & CONSTRUCTION SCHEDULE ..... | 9         |
| C. CONSULTANT DESIGN SCHEDULE .....                           | 9         |
| D. BID DOCUMENT CONSTRUCTION SCHEDULE .....                   | 9         |
| E. CONTRACTOR CONSTRUCTION PROGRESS SCHEDULE .....            | 10        |
| <b>V. PROJECT SITE LOCATION &amp; TEAM MEMBERS.....</b>       | <b>10</b> |
| A. PROJECT SITE ADDRESS .....                                 | 10        |
| B. PROJECT TEAM MEMBER DIRECTORY .....                        | 10        |
| 1. DPMC Representative: .....                                 | 11        |
| 2. Client Agency Representative: .....                        | 11        |
| <b>VI. PROJECT DEFINITION .....</b>                           | <b>11</b> |
| A. BACKGROUND .....   | 11        |
| B. FUNCTIONAL DESCRIPTION OF THE Building .....               | 11        |
| <b>VII. CONSULTANT DESIGN RESPONSIBILITIES.....</b>           | <b>12</b> |
| A. NEW ROOF DESIGN REQUIREMENTS .....                         | 12        |
| 1. New Roofing System: .....                                  | 12        |
| 2. Roof System Removal: .....                                 | 12        |
| 3. Caulking & Joint Sealants:.....                            | 12        |
| 4. Insulation: .....  | 13        |
| 5. New Roofing System Criteria:.....                          | 13        |
| 6. Flashing:.....   | 13        |
| 7. Walkways:.....   | 14        |
| 8. Roof Drains:.....  | 14        |

|     |   |    |
|-----|---|----|
| 9.  | Skylights: .....                                | 14 |
| 10  | Metal Wall Panels: .....                        | 14 |
| 11. | Night Seals: .....                              | 14 |
| 12. | Fire Protection Program: .....                  | 15 |
| 13. | Allowable Roof System Installation: .....       | 15 |
| B.  | ROOF MONITOR: .....                             | 15 |
| C.  | WARRANTY & PERFORMANCE AGREEMENT .....          | 15 |
| 1.  | Warranty: .....                                 | 15 |
| 2.  | Performance Agreement: .....                    | 15 |
| D.  | HAZARDOUS BUILDING MATERIALS.....               | 16 |
| E.  | SITE REQUIREMENTS .....                         | 17 |
| 1.  | Contractor’s Use of the Premises:.....          | 17 |
| 2.  | Dumpster:.....                                  | 17 |
| 3.  | Site Restoration: .....                         | 17 |
| 4.  | Material Staging and Protection: .....          | 17 |
| 5.  | Material Safety Data Sheets (MSDS): .....       | 18 |
| 6.  | Fire Extinguishers: .....                       | 18 |
| 7.  | HVAC Unit, Roof Ventilators, Intake Fans:.....  | 18 |
| 8.  | Existing Equipment Removal & Replacement: ..... | 18 |
| F.  | GENERAL DESIGN OVERVIEW .....                   | 18 |
| 1.  | Design Detail: .....                            | 18 |
| 2.  | Specification Format:.....                      | 19 |
| 3.  | Construction Cost Estimates: .....              | 19 |
| G.  | PROJECT COMMENCEMENT .....                      | 19 |
| 1.  | Project Directory:.....                         | 20 |
| 2.  | Site Access:.....                               | 20 |
| 3.  | Project Coordination: .....                     | 20 |
| 4.  | Existing Documentation: .....                   | 20 |
| 5.  | Scope of Work: .....                            | 20 |
| 6.  | Project Schedule: .....                         | 21 |
| H.  | BUILDING & SITE INFORMATION.....                | 21 |
| 1.  | Building Classification: .....                  | 21 |
| 2.  | Building Block & Lot Number: .....              | 21 |
| 3.  | Building Site Plan: .....                       | 21 |
| 4.  | Site Location Map:.....                         | 21 |
| I.  | DESIGN MEETINGS & PRESENTATIONS.....            | 22 |
| 1.  | Design Meetings: .....                          | 22 |
| 2.  | Design Presentations:.....                      | 22 |
| J.  | Construction Bid Document Submittal.....        | 22 |

**VIII. CONSULTANT CONSTRUCTION RESPONSIBILITIES ..... 23**

|    |  |    |
|----|--|----|
| A. | GENERAL CONSTRUCTION ADMINISTRATION OVERVIEW ..... | 23 |
| B. | PRE-BID MEETING .....                              | 23 |

|  |    |
|--|----|
| C. BID OPENING .....                                       | 23 |
| D. POST BID REVIEW MEETING, RECOMMENDATION FOR AWARD ..... | 23 |
| 1. Post Bid Review:.....                                   | 24 |
| 2. Review Meeting:.....                                    | 24 |
| 3. Substitutions:.....                                     | 24 |
| 4. Schedule:.....  | 24 |
| 5. Performance:.....                                       | 25 |
| 6. Letter of Recommendation: .....                         | 25 |
| 7. Conformed Drawings:.....                                | 25 |
| E. DIRECTOR’S HEARING.....                                 | 25 |
| F. CONSTRUCTION JOB MEETINGS, SCHEDULES, LOGS.....         | 26 |
| 1. Meetings:.....  | 26 |
| 2. Schedules:.....   | 26 |
| 3. Submittal Log: .....                                    | 27 |
| G. CONSTRUCTION SITE ADMINISTRATION SERVICES.....          | 27 |
| H. SUB-CONSULTANT PARTICIPATION.....                       | 28 |
| I. ROOF MONITOR RESPONSIBILITIES .....                     | 28 |
| 1. Roof Monitor Inspections: .....                         | 28 |
| 2. Inclement Weather:.....                                 | 28 |
| 3. Unsatisfactory Work:.....                               | 29 |
| 4. Meetings:.....  | 29 |
| J. EMERGENCY REPAIRS .....                                 | 29 |
| K. DRAWINGS .....  | 29 |
| 1. Shop Drawings:.....                                     | 29 |
| 2. As-Built & Record Set Drawings: .....                   | 30 |
| L. CONSTRUCTION DEFICIENCY LIST .....                      | 30 |
| M. INSPECTIONS: SUBSTANTIAL & FINAL COMPLETION.....        | 30 |
| N. CLOSE-OUT DOCUMENTS .....                               | 31 |
| O. CLOSE-OUT ACTIVITY TIME.....                            | 31 |
| P. TESTING, TRAINING, MANUALS AND ATTIC STOCK .....        | 31 |
| 1. Testing: .....  | 31 |
| 2. Training:.....  | 31 |
| 3. Operation & Maintenance Manuals:.....                   | 32 |
| 4. Attic Stock: .....                                      | 32 |
| Q. CHANGE ORDERS .....                                     | 33 |
| 1. Consultant: .....                                       | 33 |
| 2. Contractor: .....                                       | 33 |
| 3. Recommendation for Award:.....                          | 33 |
| 4. Code Review:.....                                       | 34 |
| 5. Cost Estimate:.....                                     | 34 |
| 6. Time Extension: .....                                   | 34 |
| 7. Submission:.....  | 35 |
| 8. Meetings:.....  | 35 |

|  |           |
|--|-----------|
| 9. Consultant Fee: .....   | 35        |
| <b>IX. PERMITS &amp; APPROVALS.....</b>                                | <b>35</b> |
| A. REGULATORY AGENCY PERMITS .....                                     | 35        |
| 1. NJ Uniform Construction Code Permit: .....                          | 35        |
| 2. Other Regulatory Agency Permits, Certificates, and Approvals: ..... | 36        |
| 3. Prior Approval Certification Letters: .....                         | 36        |
| B. BARRIER FREE REQUIREMENTS.....                                      | 37        |
| C. STATE INSURANCE APPROVAL .....                                      | 37        |
| D. PUBLIC EMPLOYEES OCCUPATIONAL SAFETY & HEALTH PROGRAM.....          | 37        |
| E. MULTI-BUILDING OR MULTI-SITE PERMITS .....                          | 37        |
| F. PERMIT MEETINGS.....  | 37        |
| G. SPECIAL INSPECTIONS.....  | 38        |
| 1. Definition: .....   | 38        |
| 2. Responsibilities: .....   | 38        |
| 3. Special Inspections: .....  | 38        |
| <b>X. GENERAL REQUIREMENTS .....</b>                                   | <b>38</b> |
| A. SCOPE CHANGES .....   | 38        |
| B. ERRORS AND OMISSIONS.....   | 39        |
| C. ENERGY INCENTIVE PROGRAM .....                                      | 39        |
| <b>XI. ALLOWANCES .....</b>  | <b>39</b> |
| A. PERMIT FEE ALLOWANCE .....  | 39        |
| 1. Permits: .....  | 39        |
| 2. Permit Costs: .....   | 39        |
| 3. Applications: .....   | 40        |
| 4. Consultant Fee: .....   | 40        |
| B. HAZARDOUS MATERIALS TESTING AND REPORT ALLOWANCE .....              | 40        |
| C. HAZARDOUS MATERIALS ABATEMENT DESIGN ALLOWANCE .....                | 41        |
| D. HAZARDOUS MATERIALS CONSTRUCTION ADMINISTRATION ALLOWANCE .....     | 41        |
| E. ROOF MONITOR ALLOWANCE.....   | 41        |
| <b>XII. SUBMITTAL REQUIREMENTS .....</b>                               | <b>42</b> |
| A. CONTRACT DELIVERABLES .....   | 42        |
| B. CATALOG CUTS .....  | 42        |
| C. PROJECT DOCUMENT BOOKLET .....                                      | 42        |
| D. DESIGN DOCUMENT CHANGES .....                                       | 42        |
| E. SINGLE-PRIME CONTRACT .....   | 42        |
| <b>XIII. SOW SIGNATURE APPROVAL SHEET.....</b>                         | <b>44</b> |
| <b>XIV. CONTRACT DELIVERABLES .....</b>                                | <b>45</b> |

---

---

**PROJECT NAME: Roof Replacement**  
**PROJECT LOCATION: Records Storage Center & Library for the Blind and Handicapped**  
**PROJECT NO: A1231-00**  
**DATE: September 23, 2015**

---

**XV. EXHIBITS..... 50**

- A. SAMPLE PROJECT SCHEDULE FORMAT
- B. LOCATION MAP
- C. PHASE I ROOF AUDIT

---

## **I. OBJECTIVE**

---

The objective of this project is to remove and replace approximately 105,300 square feet of the existing built-up roofing system on the Records Storage Center and Library for the Blind and Handicapped in West Trenton.

---

## **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 Professional Discipline**

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

- **P028 Roofing 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 \$3,159,990

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

## B. CURRENT WORKING ESTIMATE (CWE)

The Current Working Estimate (CWE) for this project is \$3,891,849.

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.

| <b>PROJECT PHASE</b>  | <b>ESTIMATED DURATION (Calendar Days)</b> |           |
|---|---|-----------|
| <b>1. Design Development Phase</b>                                    | <b>50% (Minimum)</b>                      | <b>35</b> |
| • <i>Project Team &amp; DPMC Plan/Code Unit Review &amp; Comment</i>  |   | 14        |
| <b>2. Final Design Phase</b>  | <b>100%</b>                               | <b>35</b> |
| • <i>Project Team &amp; DPMC Plan/Code Unit Review &amp; Approval</i> |   | 14        |
| <b>3. Permit Application Phase</b>                                    |   | <b>7</b>  |
| • <i>Issue Plan Release</i>   |   |           |
| <b>4. Bid Phase</b>   |   | <b>42</b> |
| <b>5. Award Phase</b>   |   | <b>28</b> |
| <b>6. Construction Phase</b>  |   | <b>90</b> |

---



## **B. CONSULTANT’S PROPOSED DESIGN & CONSTRUCTION SCHEDULE**

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

The Consultant shall estimate the duration of the project Close-Out Phase based on the anticipated time required to complete each deliverable identified in Section XIV of this document entitled “Contract Deliverables - Project Close-Out Phase” and include this information in the bar chart schedule submitted.

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.

## **C. CONSULTANT DESIGN SCHEDULE**

The Project Manager will issue the Consultant’s approved project schedule at the first design kickoff meeting. This schedule will be binding for the Consultant’s activities and will include the start and completion dates for each design activity. The Consultant and Project Team members shall use this schedule to ensure that all design milestone dates are being met for the project. The Consultant shall update the schedule to reflect performance periodically (minimally at each design phase) for the Project Team review and approval. Any recommendations for deviations from the approved design schedule must be explained in detail as to the causes for the deviation(s) and impact to the schedule.

## **D. BID DOCUMENT CONSTRUCTION SCHEDULE**

The Consultant shall include a construction schedule in Division 1 of the specification bid document. This schedule shall contain, at minimum, the major activities and their durations for each trade specified for the project. This schedule shall be in “bar chart” format and will be used by the Contractors as an aid in determining their bid price. It shall reflect special sequencing or phased construction requirements including, but not limited to: special hours for building access, weather restrictions, imposed constraints caused by Client Agency program schedules, security needs, lead times for materials and equipment, anticipated delivery dates for critical items, utility

interruption and shut-down constraints, and concurrent construction activities of other projects at the site and any other item identified by the Consultant during the design phases of the project.

## **E. CONTRACTOR CONSTRUCTION PROGRESS SCHEDULE**

The Contractor shall be responsible for preparing a coordinated combined progress schedule with the Sub-Contractors after the award of the contract. This schedule shall meet all of the requirements identified in the Consultant's construction schedule. The construction schedule shall be completed in accordance with the latest edition of the Instructions to Bidders and General Conditions entitled, "Article 6.3, Construction Progress Scheduling Provided by the Contractor".

The Consultant must review and analyze this progress schedule and recommend approval/disapproval to the Project Team until a satisfactory version is approved by the Project Team. The Project Team must approve the baseline schedule prior to the start of construction and prior to the Contractor submitting invoices for payment.

The Consultant shall note in Division 1 of the specification that the State will not accept the progress schedule until it meets the project contract requirements and any delays to the start of the construction work will be against the Contractor until the date of acceptance by the State.

The construction progress schedule shall be reviewed, approved, and updated by the Contractor, Consultant, and Project Team members at each regularly scheduled construction job meeting and the Consultant shall note the date and trade(s) responsible for project delays (as applicable).

---

## **V. PROJECT SITE LOCATION & TEAM MEMBERS**

---

### **A. PROJECT SITE ADDRESS**

The location of the project site is:

Records Storage Center & Library for the Blind and Handicapped  
2300 Stuyvesant Avenue  
Trenton, NJ

See **Exhibit 'B'** for the project site map.

### **B. PROJECT TEAM MEMBER DIRECTORY**

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

**1. DPMC Representative:**

Name: Ed Hedger, Project Manager  
Address: Division Property Management & Construction  
20 West State Street, 3<sup>rd</sup> Floor  
Trenton, NJ 08608-1206  
Phone No: (609) 984-6238  
E-Mail No: edwin.hedger@treas.nj.gov

**2. Client Agency Representative:**

Name: Gary Karr, Manager  
Address: Division Property Management & Construction  
20 West State Street, 3<sup>rd</sup> Floor  
Trenton, NJ 08608-1206  
Phone No: (609) 984-5933  
E-Mail No: gary.karr@treas.nj.gov

---

**VI. PROJECT DEFINITION**

---

**A. BACKGROUND**

The Records Storage Center and Library for the Blind and Handicapped building was constructed in 1981. The facility consists of a single story structure in the front portion of the building and a three story structure in the back that houses the record storage area. The record storage section of the building is used to archive large quantities of valuable State documents and the library for the blind section is used to provide audio discs and Braille books for distribution to the State's visually impaired. The Library for the Blind and Handicapped is also known as the Talking Books and Braille Center.

**B. FUNCTIONAL DESCRIPTION OF THE BUILDING**

The building is comprised of masonry bearing wall construction with structural steel framing supporting a steel roof deck substrate. Positive slope,  $\pm 1/4$ " per foot, is built into the steel framing.

A more detailed functional description of the existing roofing system can be found in the Phase 1 Roof Audit report, dated January 14, 2015 by ARMM Associates, Inc. as shown in **Exhibit 'C'**. ARMM recommended a full replacement of the roofing system and provided three options. The State has selected the modified bitumen roof membrane system as a replacement for the existing roof.

## **VII. CONSULTANT DESIGN RESPONSIBILITIES**

---

### **A. NEW ROOF DESIGN REQUIREMENTS**

#### **1. New Roofing System:**

The Consultant shall review the Phase 1 Roof Audit by ARMM Associates, Inc. and provide the design and specifications for a modified bitumen roof membrane system to replace the existing roof on the Records Storage Center and Library for the Blind and Handicapped building.

The design documents shall address the roof manufacturer's installation criteria, occupancy of the building, access to the building roof and security issues, approved storage methods of the roofing materials, etc.

#### **2. Roof System Removal:**

The existing roof system, insulation, flashings, and related trims shall be completely removed to the original decking and legally disposed. The existing metal deck substrate should be examined and any deteriorated sections of the metal deck be replaced. End laps and side laps should be checked and all loose sections re-secured. 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.

#### **3. 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.

#### **4. Insulation:**

Recommend new high-density rigid insulation boards that comply with current energy code requirements. (ARMM recommends a two layer flat and tapered insulation system be installed over the facility.)

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 1/4" per foot (1/2" 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).

#### **5. New Roofing System Criteria:**

Provide the design for the modified bitumen roof membrane 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 (latest version) 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.

#### **6. Flashing:**

All rooftop HVAC curbing, 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.

**7. Walkways:**

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.

**8. 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, sidewalks and driveways. Investigate the abandonment of leaking interior drain lines and the installation of new interior lines where access is impossible for repairs and/or replacement.

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.

**9. Skylights:**

Replace all skylight unit assemblies which have received caulk repairs over the years. Provide skylight assemblies with appropriate fall protection during roof replacement.

**10 Metal Wall Panels:**

Repair existing walls panels to make them watertight. Consider repair recommendations made in the ARMM report shown in **Exhibit 'C'** and provide the design and specifications for repair.

**11. 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.

## **12. 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.

## **13. Allowable Roof System Installation:**

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

## **B. ROOF MONITOR:**

The Consultant shall provide a full time roof monitor during the installation of the roof system on the building. Refer to Section VIII., paragraph I., in this scope of work, for Roof Monitor Responsibilities.

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 XI.E.

## **C. WARRANTY & PERFORMANCE AGREEMENT**

### **1. Warranty:**

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

### **2. Performance Agreement:**

The Contractor shall provide a five (5) year performance agreement on labor and material in addition to the manufacturer's warranty. This performance shall include an annual inspection and written report on a DPMC Inspection Form, for each of the five (5) years.

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

## D. 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 Subcode.
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.

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 XI.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, subcode 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 XI.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 XI.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.D “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.

## **E. SITE REQUIREMENTS**

### **1. Contractor’s Use of the Premises:**

Develop a “Contractor’s Use of the Premises” directive with the Project Team that will identify any special policies, procedures, security requirements, etc. that must be observed by the Contractors during all work conducted at the facility and include this information in Division 1 of the specification.

Develop procedures for personnel to access the project site and construction areas, and provide the names and phone numbers of approved escorts when needed.

### **2. Dumpster:**

The location and security requirements of the dumpster shall be identified on the site plan in an area approved by the Client Agency, and the frequency of debris removal shall be identified in the design specification.

### **3. Site Restoration:**

Include in the contract documents that the site must be restored to pre-construction conditions after construction has been completed and approved.

### **4. Material Staging and Protection:**

The Client Agency shall approve the construction material staging area and the location shall be shown on the project site plan.

All stored roofing felts, insulation boards, and/or other roofing components shall be protected from the elements and moisture with plastic sheet covers or other approved materials.

**5. Material Safety Data Sheets (MSDS):**

Specify in the contract documents that the Contractor shall provide material safety data sheets on site for all roofing materials used such as: sealants, bonding adhesives, solvents, bitumen, etc.

**6. Fire Extinguishers:**

Design documents shall require the Contractor to make provisions for stand-by portable fire extinguishers of proper size and type. They shall be located on the roof and/or near any source of open flame or spark and all employees shall be trained in their proper use.

**7. HVAC Unit, Roof Ventilators, Intake Fans:**

Requirements to shutdown all rooftop equipment and allowable hours of adhesive application shall be identified in the contract documents to prevent fumes from entering the building.

**8. Existing Equipment Removal & Replacement:**

Identify on the design drawings any existing equipment and materials that must be removed in order to install any component of the new roofing system such as: lights, security cameras, lightning protection systems, antennas, piping, conduit, etc. and include details indicating the approved methods of reattachment.

**F. GENERAL DESIGN OVERVIEW**

**1. Design Detail:**

Section VII of this Scope of Work is intended as a guide for the Consultant to understand the overall basic design requirements of the project and is not intended to identify each specific design component related to code and construction items. The Consultant shall provide those details during the design phase of the project ensuring that they are in compliance with all applicable codes, regulating authorities, and the guidelines established in the DPMC Procedures for Architects and Engineers Manual.

The Consultant shall understand that construction documents submitted to DPMC shall go beyond the basic requirements set forth by the current copy of the Uniform Construction Code N.J.A.C. 5:23-2.15(f). Drawings and specifications shall provide detail beyond that required to merely show the nature and character of the work to be performed. The construction documents shall provide sufficient information and detail to illustrate, describe and clearly delineate the design intent of the Consultant and enable all Contractors to uniformly bid the project.

The Consultant shall ensure that all of the design items described in this scope of work are addressed and included in the project drawings and specification sections where appropriate.

It shall be the Consultant's responsibility to provide all of the design elements for this project. Under no circumstance may they delegate the responsibility of the design; or portions thereof, to the Contractor unless specifically allowed in this Scope of Work.

## **2. Specification Format:**

The Consultant shall prepare the construction specifications in the Construction Specifications Institute (CSI) format entitled MasterFormat© 2014.

The project construction specifications shall include only those CSI MasterFormat© 2014 specification sections and divisions applicable to this specific project.

## **3. Construction Cost Estimates:**

The Consultant shall include with each design submittal phase identified in Paragraph IV.A, including the Permit Application Phase and Bid Phase, a detailed construction cost estimate itemized and summarized by the divisions and sections of the Construction Specification Institute (CSI) MasterFormat© 2014 applicable to the project.

The detailed breakdown of each work item shall include labor, equipment, material and total costs.

The construction estimate shall include all alternate bid items and unit price items summarized by the divisions and sections of the specifications.

All cost estimates shall be adjusted for regional location, site factors, construction phasing, premium time, building use group, location of work within the building, temporary swing space, security issues, and inflation factors based on the year in which the work is to be performed.

The cost estimate shall include descriptions of all allowances and contingencies noted in the estimate.

All cost estimates must be submitted on a DPMC-38 Project Cost Analysis form at each design phase of the project supported by the detailed construction cost estimate. The Project Manager will provide cost figures for those items which may be in addition to the CCE such as art inclusion, CM services, etc. and must be included as part of the CWE. This cost analysis must be submitted for all projects regardless of the Construction Cost Estimate amount.

## **G. PROJECT COMMENCEMENT**

---

A pre-design meeting shall be scheduled with the Consultant and the Project Team members at the commencement of the project to obtain and/or coordinate the following information:

**1. Project Directory:**

Develop a project directory that identifies the name and phone number of key designated representatives who may be contacted during the design and construction phases of this project.

**2. Site Access:**

Develop procedures to access the project site and provide the names and phone numbers of approved escorts when needed. Obtain copies of special security and policy procedures that must be followed during all work conducted at the facility and include this information in Division 1 of the specification.

**3. Project Coordination:**

Review and become familiar with any current and/or future projects at the site that may impact the design, construction, and scheduling requirements of this project. Incorporate all appropriate information and coordination requirements in Division 1 of the specification.

**4. Existing Documentation:**

Review any documents and 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.

**5. Scope of Work:**

Review the design and construction administration responsibilities and the submission requirements identified in this Scope of Work with the Project Team members. Items such as: contract deliverables, special sequencing or phased construction requirements, special hours for construction based on Client Agency programs or building occupancy, security needs, delivery dates of critical and long lead items, utility interruptions or shut down constraints for tie-ins, weather restrictions, and coordination with other project construction activities at the site shall be addressed.

This information and all general administrative information; including a narrative summary of the work for this project, *shall be included in Division 1* of the specification. The Consultant shall assure that there are no conflicts between the information contained in Division 1 of the specification and the DPMC General Conditions.

**6. Project Schedule:**

Review and update the project design and construction schedule with the Project Team members.

**H. BUILDING & SITE INFORMATION**

The following information shall be included in the project design documents.

**1. Building Classification:**

Provide the building Use Group Classification and Construction Type on the appropriate design drawing.

**2. Building Block & Lot Number:**

Provide the site Block and Lot Number on the appropriate design drawing.

**3. Building Site Plan:**

Only when the project scope involves site work, or when the design triggers code issues that require site information to show code compliance, shall a site plan be provided that is drawn in accordance with an accurate boundary line survey. The site plan shall include, but not be limited to, the following as may be applicable:

- The size and location of new and existing buildings and additions as well as other structures.
- The distance between buildings and structures and to lot lines.
- Established and new site grades and contours as well as building finished floor elevations.
- New and existing site utilities, site vehicular and pedestrian roads, walkways and parking areas.

**4. Site Location Map:**

Provide a site location map on the drawing cover sheet that identifies the vehicular travel routes from major roadways to the project construction site and the approved access roads to the Contractor's worksite staging area.

## **I. 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 seven (7) 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.

## **J. CONSTRUCTION BID DOCUMENT SUBMITTAL**

In addition to submitting construction bid documents as defined in Section XIV Contract Deliverables, Consultant shall submit both specifications and drawings on compact disk (CD) in *Adobe Portable Document Format (.pdf)*.

## **VIII. CONSULTANT CONSTRUCTION RESPONSIBILITIES**

---

### **A. GENERAL CONSTRUCTION ADMINISTRATION OVERVIEW**

This section of the Scope of Work is intended as a guide for the Consultant to understand their overall basic construction administration responsibilities for the project and does not attempt to identify each specific activity or deliverable required during this phase. The Consultant shall obtain that information from the current publication of the DPMC Procedures for Architects and Engineers Manual and any additional information provided during the Consultant Selection Process.

### **B. PRE-BID MEETING**

The Consultant shall attend, chair, record and distribute minutes of the Contractor pre-bid meetings. When bidders ask questions that may affect the bid price of the project, the Consultant shall develop a Bulletin(s) to clarify the bid documents in the format described in the Procedures for Architects and Engineers Manual, Section 9.2 entitled "Bulletins." These Bulletins must be sent to DPMC at least seven (7) calendar days prior to the bid opening date. DPMC will then distribute the document to all bidders.

### **C. BID OPENING**

The Consultant must attend the bid opening held at the designated location.

In the event that the construction bids received exceed the Consultant's approved final cost estimate by 5% or more, the Consultant shall redesign and/or set up sufficient approved alternate designs, plans and specifications for the project work, to secure a bid that will come within the allocation specified by the State without impacting the programmatic requirements of the project. Such redesign work and changes to plans, including reproduction costs for submission in order to obtain final approval and permits, shall be undertaken by the Consultant at no additional cost to the State.

### **D. POST BID REVIEW MEETING, RECOMMENDATION FOR AWARD**

The Consultant; in conjunction with the Project Manager, shall review the bid proposals submitted by the various Contractors to determine the low responsible bid for the project. The Consultant; in conjunction with the Project Manager and Project Team members, shall develop a post bid questionnaire based on the requirements below and schedule a post bid review meeting with the Contractor's representative to review the construction costs and schedule, staffing, and other pertinent information to ensure they understand the Scope of the Work and that their bid proposal is complete and inclusive of all requirements necessary to deliver the project in strict accordance with the plans and specifications.

**1. Post Bid Review:**

Review the project bid proposals including the alternates, unit prices, and allowances within seven (7) calendar days from the bid due date. Provide a bid tabulation matrix comparing all bids submitted and make a statement about the high, low, and average bids received. Include a comparison of the submitted bids to the approved current construction cost estimate. When applicable, provide an analysis with supporting data, detailing why the bids did not meet the construction cost estimate.

**2. Review Meeting:**

Arrange a meeting with the apparent low bid Contractor to discuss their bid proposal and other issues regarding the award of the contract. Remind the Contractor that this is a Lump Sum bid. Request the Contractor to confirm that their bid proposal does not contain errors. Review and confirm Alternate pricing and Unit pricing and document acceptance or rejection as appropriate.

Comment on all omissions, qualifications and unsolicited statements appearing in the proposals. Review any special circumstances of the project. Ensure the Contractor's signature appears on all post bid review documents.

**3. Substitutions:**

Inquire about any potential substitutions being contemplated by the Contractor and advise them of the State's guidelines for the approval of substitutions and the documentation required. Review the deadline and advise the Contractor that partial submissions are not acceptable. Submission after the deadline may be rejected by the State.

Equal substitutions that are proposed by the Contractor that are of lesser value must have a credit change order attached with the submittal (See Article 4.7.5 "Substitutions" of the General Conditions). The State has the right to reject the submission if there is no agreement on the proposed credit. Contractor will be responsible to submit a specified item.

**4. Schedule:**

Confirm that the Contractor is aware of the number of calendar days listed in the contract documents for the project duration and that the Contractor's bid includes compliance with the schedule duration and completion dates. Particular attention shall be given to special working conditions, long lead items and projected delivery dates, etc. Review project milestones (if applicable). This could give an indication of Contractor performance, but not allow a rejection of the bid.



Review the submittal timeframes per the Contract documents. Ask the Contractor to identify what products will take over twenty-eight (28) calendar days to deliver from the point of submittal approval.

If a CPM Schedule is required, review the provisions and have Contractor acknowledge the responsibility. Ask for the name of the CPM Scheduler and the “ballpark” costs.

#### **5. Performance:**

Investigate the past performance of Contractor by contacting Architects and owners (generally three of each) that were listed in their DPMC pre-qualification package and other references that may have been provided. Inquire how the Contractor performed with workmanship, schedule, project management, change orders, cooperation, paper work, etc.

#### **6. Letter of Recommendation:**

The Consultant shall prepare a Letter of Recommendation for contract award to the Contractor submitting the lowest responsible bid within three (3) calendar days from the post bid review meeting. The document shall contain the project title, DPMC project number, bid due date and expiration date of the proposal. It shall include a detailed narrative describing each post bid meeting agenda item identified above and a recommendation to award the contract to the apparent low bid Contractor based on the information obtained during that meeting. Describe any acceptance or rejection of Alternate pricing and Unit pricing.

Comment on any discussion with the Contractor that provides a sense of their understanding of the project and any special difficulties that they see, and how they might approach those problems.

Attach all minutes of the Post bid meeting and any other relevant correspondence with the Letter of Recommendation and submit them to the Project Manager.

#### **7. Conformed Drawings:**

The Consultant shall prepare and distribute two (2) sets of drawings stamped “Conformed Drawings” to the Project Manager that reflect all Bulletins and/or required changes, additions, and deletions to the pertinent drawings within fourteen (14) calendar days of the construction contract award date.

Any changes made in Bulletins, meeting minutes, post bid review requirements shall also be reflected in the specification.

### **E. DIRECTOR’S HEARING**

The Consultant must attend any Director's hearing(s) if a Contractor submits a bid protest. The Consultant shall be present to interpret the intent of the design documents and answer any technical questions that may result from the meeting. In cases where the bid protest is upheld, the Consultant shall submit a new "Letter of Recommendation" for contract award. The hours required to attend the potential hearings and to document the findings shall be estimated by the Consultant and the costs will be included in the base bid of their fee proposal.

## **F. CONSTRUCTION JOB MEETINGS, SCHEDULES, LOGS**

The Consultant shall conduct all of the construction job meetings, to be held bi-weekly for the duration of construction, in accordance with the procedures identified in the A/E manual and those listed below.

### **1. Meetings:**

The Consultant and Sub-Consultant(s) shall attend the pre-construction meeting and all construction job meetings during the construction phase of the project. The Consultant shall chair the meeting, transcribe and distribute the job-meeting minutes for every job meeting to all attendees and to those persons specified to be on the distribution list by the Project Manager. The Agenda for the meeting shall include, but not be limited to the items identified in the Procedures for Architects and Engineers Manual, Section 10.3.1, entitled "Agenda."

Also, the Consultant is responsible for the preparation and distribution of minutes within three (3) calendar days of the meeting. The format to be used for the minutes shall comply with those identified in the "Procedures for Architects and Engineers Manual," Section 10.3.4, entitled, "Format of Minutes." All meeting minutes are to have an "action" column indicating the party that is responsible for the action indicated and a deadline to accomplish the assigned task. These tasks must be reviewed at each job progress meeting until it is completed and the completion date of each task shall be noted in the minutes of the meeting following the task completion.

### **2. Schedules:**

The Consultant; with the input from the Client Agency Representative and Project Manager, shall review and recommend approval of the project construction schedule prepared by the Contractor. The schedule shall identify all necessary start and completion dates of construction, construction activities, submittal process activities, material deliveries and other milestones required to give a complete review of the project.

The Consultant shall record any schedule delays, the party responsible for the delay, the schedule activity affected, and the original and new date for reference.

The Consultant shall ensure that the Contractor provides a two (2) week "look ahead" construction schedule based upon the current monthly updated schedule as approved at the bi-

weekly job meetings and that identifies the daily planned activities for that period. This Contractor requirement must also be included in Division 1 of the specification for reference.

### **3. Submittal Log:**

The Consultant shall develop and implement a submittal log that will identify all of the required project submittals as identified in the design specification. The dates of submission shall be determined and approved by all affected parties during the pre-construction meeting.

Examples of the submissions to be reviewed and approved by the Consultant and Sub-Consultant (if required) include: shop drawings, change orders, Request for Information (RFI), equipment and material catalog cuts, spec sheets, product data sheets, MSDS material safety data sheets, specification procedures, color charts, material samples, mock-ups, etc. The submittal review process must be conducted at each job progress meeting and shall include the Consultant, Sub-Consultant, Contractor, Project Manager, and designated representatives of the Client Agency.

The Consultant shall provide an updated submittal log at each job meeting that highlights all of the required submissions that are behind schedule during the construction phase of the project.

## **G. CONSTRUCTION SITE ADMINISTRATION SERVICES**

The Consultant and Sub-Consultant(s) shall provide construction site administration services during the duration of the project. The Consultant and Sub-Consultant(s) do not necessarily have to be on site concurrently if there are no critical activities taking place that require the Sub-Consultant's participation.

The services required shall include, but not be limited to; field observations sufficient to verify the quality and progress of construction work, conformance and compliance with the contract documents, and to attend/chair meetings as may be required by the Project Manager to resolve special issues.

Consultant and Sub-Consultant(s) shall conduct weekly site inspection/field observation visits. Site inspection/field observation visits may be conducted in conjunction with regularly scheduled bi-weekly construction job meetings, depending on the progress of work, for weeks that construction job meetings are scheduled. The Consultant and their Sub-Consultant(s) shall submit a field observation report for each site inspection to the Project Manager within three (3) calendar days of the site visit. Also, they shall conduct inspections during major construction activities including, but not limited to the following examples: concrete pours, steel and truss installations, code inspections, final testing of systems, achievement of each major milestone required on the construction schedule, and requests from the Project Manager. The assignment of a full time on-site Sub-Consultant does not relieve the Consultant of their site visit obligation.

The Consultant shall refer to Section XIV. Contract Deliverables of this Scope of Work subsection entitled “Construction Phase” to determine the extent of services and deliverables required during this phase of the project.

## **H. SUB-CONSULTANT PARTICIPATION**

It is the responsibility of the Consultant to ensure that they have provided adequate hours and/or time allotted in their technical proposal so that their Sub-Consultants may participate in all appropriate phases and activities of this project or whenever requested by the Project Manager. This includes the pre-proposal site visit and the various design meetings and construction job meetings, site visits, and close-out activities described in this Scope of Work. Field observation reports and/or meeting minutes are required to be submitted to the Project Manager within three (3) calendar days of the site visit or meeting. All costs associated with such services shall be included in the base bid of the Consultant’s fee proposal.

## **I. ROOF MONITOR RESPONSIBILITIES**

Depending on funding availability, the Consultant shall provide a full time roof monitor during the installation of the roof system on the building. 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.

## **J. 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 four (4) 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.

## **K. DRAWINGS**

### **1. Shop Drawings:**

Each Contractor shall review the specifications and determine the numbers and nature of each shop drawing submittal. Five (5) sets of the documents shall be submitted with reference made to the appropriate section of the specification. The Consultant shall review the Contractor's shop drawing submissions for conformity with the construction documents within seven (7) calendar days of receipt. The Consultant shall return each shop drawing submittal stamped with the appropriate action, i.e. "Approved", "Approved as Noted", "Approved as Noted Resubmit for Records", "Rejected", etc.

## **2. As-Built & Record Set Drawings:**

The Contractor(s) shall keep the contract drawings up-to-date at all times during construction and upon completion of the project, submit their AS-BUILT drawings to the Consultant with the Contractor(s) certification as to the accuracy of the information prior to final payment. All AS-BUILT drawings submitted shall be entitled AS-BUILT above the title block and dated.

The Consultant shall review the Contractor(s)' AS-BUILT drawings at each job progress meeting to ensure that they are up-to-date. Any deficiencies shall be noted in the progress meeting minutes.

The Consultant shall acknowledge acceptance of the AS-BUILT drawings by signing a transmittal indicating they have reviewed them and that they reflect the AS-BUILT conditions as they exist.

Upon receipt of the AS-BUILT drawings from the Contractor(s), the Consultant shall obtain the original reproducible drawings from DPMC and transfer the AS-BUILT conditions to the original full sized signed reproducible drawings to reflect RECORD conditions within fourteen (14) calendar days of receipt of the AS-BUILT information.

The Consultant shall note the following statement on the original RECORD-SET drawings. "The AS-BUILT information added to this drawing(s) has been supplied by the Contractor(s). The Architect/Engineer does not assume the responsibility for its accuracy other than conformity with the design concept and general adequacy of the AS-BUILT information to the best of the Architect's/Engineer's knowledge."

Upon completion, The Consultant shall deliver the RECORD-SET original reproducible drawings to DPMC who will acknowledge their receipt in writing. This hard copy set of drawings and two (2) sets of current release AUTO CAD discs shall be submitted to DPMC. The discs shall contain all AS-BUILT drawings in both ".dwg" (native file format for AUTO CAD) and ".pdf" (*Adobe* portable document format) file formats.

## **L. CONSTRUCTION DEFICIENCY LIST**

The Consultant shall prepare, maintain and continuously distribute an on-going deficiency list to the Contractor, Project Manager, and Client Agency Representative during the construction phase of the project. This list shall be separate correspondence from the field observation reports and shall not be considered as a punch list.

## **M. INSPECTIONS: SUBSTANTIAL & FINAL COMPLETION**

The Consultant and their Sub-Consultant(s) accompanied by the Project Manager, Code Inspection Group, Client Agency Representative and Contractor shall conduct site inspections to

determine the dates of substantial and final completion. The Project Manager will issue the only recognized official notice of substantial completion. The Consultant shall prepare and distribute the coordinated punch list, written warranties and other related DPMC forms and documents, supplied by the Contractor, to the Project Manager for review and certification of final contract acceptance.

If applicable, the punch list shall include a list of attic stock and spare parts.

## **N. CLOSE-OUT DOCUMENTS**

The Consultant shall review all project close-out documents as submitted by the Contractors to ensure that they comply with the requirements listed in the "Procedure for Architects and Engineers' Manual." The Consultant shall forward the package to the Project Manager within fourteen (14) calendar days from the date the Certificate of Occupancy/Certificate of Approval is issued. The Consultant shall also submit a letter certifying that the project was completed in accordance with the contract documents, etc.

## **O. CLOSE-OUT ACTIVITY TIME**

The Consultant shall provide all activities and deliverables associated with the "Close-Out Phase" of this project as part of their Lump Sum base bid. The Consultant and/or Sub-Consultant(s) may not use this time for additional job meetings or extended administrative services during the Construction Phase of the project.

## **P. TESTING, TRAINING, MANUALS AND ATTIC STOCK**

The Consultant shall ensure that all equipment testing, training sessions and equipment manuals required for this project comply with the requirements identified below.

### **1. Testing:**

All equipment and product testing conducted during the course of construction is the responsibility of the Contractor. However, the Consultant shall ensure the testing procedures comply with manufacturers recommendations. The Consultant shall review the final test reports and provide a written recommendation of the acceptance/rejection of the material, products or equipment tested within seven (7) calendar days of receipt of the report.

### **2. Training:**

The Consultant shall include in the specification that the Contractor shall schedule and coordinate all equipment training with the Project Manager and Client Agency representatives. It shall state that the Contractor shall submit the Operation and Maintenance (O&M) manuals,

training plan contents, and training durations to the Consultant, Project Manager and Client Agency Representative for review and approval prior to the training session.

The Consultant shall ensure that the training session is “videotaped” by the Contractor. A copy of the “videotape” shall be transmitted to the Project Manager who will forward the material to the Client Agency for future reference.

All costs associated with the training sessions shall be borne by the Contractor installing the equipment. A signed letter shall be prepared stating when the training was completed and must be accompanied with the training session sign-in sheet as part of the project close-out package.

### **3. Operation & Maintenance Manuals:**

The Consultant shall coordinate and review the preparation and issuance of the equipment manuals provided by the Contractor(s) ensuring that they contain the operating procedures, maintenance procedures and frequency, cut sheets, parts lists, warranties, guarantees, and detailed drawings for all equipment installed at the facility.

A troubleshooting guide shall be included that lists problems that may arise, possible causes with solutions, and criteria for deciding when equipment shall be repaired and when it must be replaced.

Include a list of the manufacturer’s recommended spare parts for all equipment being supplied for this project.

A list of names, addresses and telephone numbers of the Contractors involved in the installations and firms capable of performing services for each mechanical item shall be included. The content of the manuals shall be reviewed and approved by the Project Manager and Client Agency Representative.

The Consultant shall include in the specification that the Contractor must provide a minimum of ten (10) “throwaway” copies of the manual for use at the training seminar and seven (7) hardbound copies as part of the project close-out package.

### **4. Attic Stock:**

The Consultant shall determine and recommend whether “attic stock” should be included for all aspects of the project. If required, the Consultant shall specify attic stock items to be included in the project.

Prior to project close-out, the Consultant must prepare a comprehensive listing of all items for delivery by the Contractor to the Owner and in accordance with the appropriate specification/plan section. Items shall include, but not be limited to: training sessions, O&M



manuals, as-built drawings, itemized attic stock requirements, and manufacturer guarantees/warranties.

## **Q. CHANGE ORDERS**

The Consultant shall review and process all change orders in accordance with the contract documents and procedures described below.

### **1. Consultant:**

The Consultant shall prepare a detailed request for Change Order including a detailed description of the change(s) along with appropriate drawings, specifications, and related documentation and submit the information to the Contractor for the change order request submission. This will require the use of the current DPMC 9b form.

### **2. Contractor:**

The Contractor shall submit a DPMC 9b Change Order Request form to the Project Manager within seven (7) calendar days after receiving the Change Order from the Consultant. The document shall identify the changed work in a manner that will allow a clear understanding of the necessity for the change. Copies of the original design drawings, sketches, etc. and specification pages shall be highlighted to clarify and show entitlement to the Change Order.

Copies shall be provided of job minutes or correspondence with all relative information highlighted to show the origin of the Change Order. Supplementary drawings from the Consultant shall be included if applicable that indicate the manner to be used to complete the changed work. A detailed breakdown of all costs associated with the change, i.e. material, labor, equipment, overhead, Sub-Contractor work, profit and bond, and certification of increased bond shall be provided.

If the Change Order will impact the time of the project, the Contractor shall include a request for an extension of time. This request shall include a copy of the original approved project schedule and a proposed revised schedule that reflects the impact on the project completion date. Documentation to account for the added time requested shall be included to support entitlement of the request such as additional work, weather, other Contractors, etc. This documentation shall contain dates, weather data and all other relative information.

### **3. Recommendation for Award:**

The Consultant shall evaluate the reason for the change in work and provide a detailed written recommendation for approval or disapproval of the Change Order Request including backup documentation of costs in CSI format and all other considerations to substantiate that decision.

#### **4. Code Review:**

The Consultant shall determine if the Change Order request will require Code review and shall submit six (6) sets of signed and sealed modified drawings and specifications to the DPMC Plan & Code Review Unit for approval, if required. The Consultant must also determine and produce a permit amendment request if required.

#### **5. Cost Estimate:**

The Consultant shall provide a detailed cost estimate of the proposed Change Order Request, as submitted by the Contractor, in CSI format (2004 Edition) for all appropriate divisions and sub-divisions using a recognized estimating formula. The estimate shall then be compared with that of the Contractor's estimate. If any line item in the Consultant's estimate is lower than the corresponding line item in the Contractor's estimate, the Consultant in conjunction with the Project Manager is to contact the Contractor by telephone and negotiate the cost differences. The Consultant shall document the negotiated agreement on the Change Order Request form. If the Contractor's total dollar value changes based on the negotiations, the Consultant shall identify the changes on the Change Order Request form accordingly.

When recommending approval or disapproval of the change order, the Consultant shall be required to prepare and process a Change Order package that contains at a minimum the following documents:

- DPMC 9b Change Order Request
- DPMC 10 Consultant's Evaluation of Contractor's Change Order Request
- Consultant's Independent Detailed Cost Estimate
- Notes of Negotiations

#### **6. Time Extension:**

When a Change Order Request is submitted with both cost and time factors, the Consultant's independent cost estimate is to take into consideration time factors associated with the changed work. The Consultant is to compare their time element with that of the Contractor's time request and if there is a significant difference, the Consultant in conjunction with the Project Manager is to contact the Contractor by telephone and negotiate the difference.

When a Change Order Request is submitted for time only, the Consultant is to do an independent evaluation of the time extension request using a recognized scheduling formula.

Requests for extension of contract time must be done in accordance with the General Conditions Article 10.1 "Changes in the Work".

**7. Submission:**

The Consultant shall complete all of the DPMC Change Order Request forms provided and submit a completed package to the Project Manager with all appropriate backup documentation within seven (7) calendar days from receipt of the Contractor's change order request. The Consultant shall resubmit the package at no cost to the State if the change order package contents are deemed insufficient by the Project Manager.

**8. Meetings:**

The Consultant shall attend and actively participate at all administrative hearings or settlement conferences as may be called by Project Manager in connection with such Change Orders and provide minutes of those meetings to the Project Manager for distribution.

**9. Consultant Fee:**

All costs associated with the potential Contractor Change Order Requests shall be anticipated by the Consultant and included in the base bid of their fee proposal.

If the Client Agency Representative requests a scope change; and it is approved by the Project Manager, the Consultant may be entitled to be reimbursed through an amendment and in accordance with the requirements stated in paragraph 10.01 of this Scope of Work.

---

**IX. PERMITS & APPROVALS**

---

**A. REGULATORY AGENCY PERMITS**

The Consultant shall comply with the following guidelines to ensure that all required permits, certificates, and approvals required by State regulatory agencies are obtained for this project.

**1. NJ Uniform Construction Code Permit:**

The Consultant shall complete the NJUCC permit application and all applicable technical sub-code sections with all technical site data listed. The Agent section of the application and certification section of the building sub-code section shall be signed. These documents shall be forwarded to the Project Manager who will send them to the Department of Community Affairs (DCA) and all permit application costs will be paid by DPMC from encumbered funds for the project.

The Consultant may obtain copies of all NJUCC Building, Fire, Plumbing, Electrical and Elevator permit applications at the following website: <http://www.state.nj.us/dca/divisions/codes/resources/constructionpermitforms.html>

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

All other required project permits shall be obtained and paid for by the Consultant in accordance with the procedures described in paragraph 2. below.

## **2. 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", Section 6.4.8, 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.

## **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.

## **B. BARRIER FREE REQUIREMENTS**

The Consultant, in cooperation with the Client Agency Representative, shall assure that this project complies with the NJUCC Barrier Free Sub code where applicable.

## **C. STATE INSURANCE APPROVAL**

The Consultant shall respond in writing to the FM Global Insurance Underwriter plan review comments through the DPMC Plan & Code Review Unit Manager as applicable. The Consultant shall review all the comments and, with agreement of the Project Team, modify the documents while adhering to the project's SOW requirements, State code requirements, schedule, budget, and Consultant fee.

## **D. PUBLIC EMPLOYEES OCCUPATIONAL SAFETY & HEALTH PROGRAM**

A paragraph shall be included in the design documents, if applicable to this project that states: The Contractor shall comply with all the requirements stipulated in the Public Employees Occupational Safety & Health Program (PEOSHA) document, paragraph 12:100-13.5 entitled "Air quality during renovation and remodeling". The Contractor shall submit a plan demonstrating the measures to be utilized to confine the dust, debris, and air contaminants in the renovation or construction area of the project site to the Project Team prior to the start of construction.

The link to the document is: <http://www.state.nj.us/health/eoh/peoshweb/iaqstd.pdf>

## **E. 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.

## **F. PERMIT MEETINGS**

The Consultant shall attend and chair all meetings with Permitting Agencies necessary to explain and obtain the required permits.

## **G. 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.

### **1. Definition:**

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

### **2. 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.

### **3. Special Inspections:**

Special inspections, as applicable to this project, shall be performed in accordance with UCC Bulletin 03-5 and Chapter 17 of the International Building Code, New Jersey Edition.

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

---

## **X. GENERAL REQUIREMENTS**

---

### **A. SCOPE CHANGES**

The Consultant must request any changes to this Scope of Work in writing. An approved DPMC 9d Consultant Amendment Request form reflecting authorized scope changes must be received by the Consultant prior to undertaking any additional work. The DPMC 9d form must be approved and signed by the Director of DPMC and written authorization issued from the Project

Manager prior to any work being performed by the Consultant. Any work performed without the executed DPMC 9d form is done at the Consultant's own financial risk.

## **B. ERRORS AND OMISSIONS**

The errors and omissions curve and the corresponding sections of the "Procedures for Architects and Engineers Manual" are eliminated. All claims for errors and omissions will be pursued by the State on an individual basis. The State will review each error or omission with the Consultant and determine the actual amount of damages, if any, resulting from each negligent act, error or omission.

## **C. ENERGY INCENTIVE PROGRAM**

The Consultant shall review the programs described on the "New Jersey's Clean Energy Program" website at: <http://www.njcleanenergy.com> to determine if any proposed upgrades to the mechanical and/or electrical equipment and systems for this project qualify for "New Jersey Clean Energy Program" rebates and incentives such as SmartStart, Pay4Performance, Direct Install or any other incentives.

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 their fee proposal.

---

# **XI. ALLOWANCES**

---

## **A. 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 State permits, certificates, and approvals required to complete this project.

### **2. Permit Costs:**

The Consultant shall determine 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 their fee proposal line item entitled **“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 is obtained and paid for by DPMC.

### **3. Applications:**

The Consultant shall fill out and submit all permit applications to the appropriate permitting authorities and the costs shall be paid from the Consultant’s permit fee allowance provided. A copy of the application(s) and the original permit(s) obtained by the Consultant shall be given to the 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 their fee proposal under the “Permit Phase” column.

Any funds remaining in the permit allowance account 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.D 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.D 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.D 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 VIII, paragraph I 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.

## **XII.SUBMITTAL REQUIREMENTS**

---

### **A. CONTRACT DELIVERABLES**

All submissions shall include the Contract Deliverables identified in Section XIV of this Scope of Work and described in the DPMC Procedures for Architects and Engineers Manual.

### **B. CATALOG CUTS**

The Consultant shall provide catalog cuts as required by the DPMC Plan & Code Review Unit during the design document review submissions. Examples of catalog cuts include, but are not limited to: mechanical equipment, hardware devices, plumbing fixtures, fire suppression and alarm components, specialized building materials, electrical devices, etc.

### **C. PROJECT DOCUMENT BOOKLET**

The Consultant shall submit all of the required Contract Deliverables to the Project Manager at the completion of each phase of the project. All reports, meeting minutes, plan review comments, project schedule, cost estimate in CSI format (2004 Edition), correspondence, calculations, and other appropriate items identified on the Submission Checklist form provided in the A/E Manual shall be presented in an 8½” x 11” bound “booklet” format.

### **D. DESIGN DOCUMENT CHANGES**

Any corrections, additions, or omissions made to the submitted drawings and specifications at the Permit Phase of the project must be submitted to DPMC Plan & Code Review Unit as a complete document. Corrected pages or drawings may not be submitted separately unless the Consultant inserts the changed page or drawing in the original documents. No Addendums or Bulletins will be accepted as a substitution to the original specification page or drawing.

### **E. SINGLE-PRIME CONTRACT**

All references to “separate contracts” in the Procedures for Architects and Engineers Manual, Chapter 8, shall be deleted since this project will be advertised as a “Single Bid” (Lump Sum All Trades) contract. The single prime Contractor will be responsible for all work identified in the drawings and specifications.

The drawings shall have the required prefix designations and the specification sections shall have the color codes as specified for each trade in the DPMC Procedure for Architects and Engineers Manual.

**PROJECT NAME: Roof Replacement**  
**PROJECT LOCATION: Records Storage Center & Library for the Blind and Handicapped**  
**PROJECT NO: A1231-00**  
**DATE: September 23, 2015**

---

The Consultant must still develop the Construction Cost Estimate (CCE) for each trade and the amount shall be included on the DPMC-38 Project Cost Analysis form where indicated. This document shall be submitted at each design phase of the project and updated immediately prior to the advertisement to bid.



## **XIV. CONTRACT DELIVERABLES**

---

The following is a listing of 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," Volumes I and II, 2<sup>nd</sup> Edition, dated January, 1991 to obtain a more detailed description of the deliverables required for each item listed below.

The numbering system used in this "Contract Deliverables" section of the scope of work corresponds to the numbering system used in the "Procedures for Architects and Engineers" manual and some may have been deleted if they do not apply to this project.

### **DESIGN DEVELOPMENT PHASE: 50% Complete Design Documents (Minimum)**

#### **7.1 Project Schedule (Update Bar Chart Schedule)**

#### **7.2 Meetings & Minutes (Minutes within seven (7) calendar days of meeting)**

#### **7.3 Correspondence**

#### **7.4 Submission Requirements**

7.4.1 A/E Statement of Site Visit, As-Built Drawing Verification (if available)

7.4.4 Site Evaluation

7.4.7 Design Rendering/Sketches

7.4.8 Regulatory Agency Approvals

7.4.10 Drawings: 6 sets

Cover Sheet (See A/E Manual for format)

Roof Plan

Sections/Details

7.4.11 Specifications: 6 sets (See A/E Manual for format, include Division 1 and edit to describe the administrative and general requirements of the project)

7.4.12 Current Working Estimate in CSI Format & Cost Analysis 38 Form

7.4.13 Bar Chart of Design and Construction Schedule

7.4.14 Oral Presentation of Submission to Project Team

7.4.15 SOW Compliance Statement

7.4.16 This Submission Checklist (See A/E Manual, Figure 6.4.16 for format)

7.4.17 Deliverables Submission in Booklet Form: 7 sets

#### **7.5 Approval**

7.5.1 Respond to Submission Comments

## **7.6 Submission Forms**

- Figure 7.4.12 Current Working Estimate/Cost Analysis
- Figure 7.4.16 Submission Checklist

## **FINAL DESIGN PHASE 100% Complete Construction Documents**

This Final Design Phase may require more than one submission based on the technical quality and code conformance of the design documents.

### **8.1 Schedule (Update Bar Chart Schedule)**

### **8.2 Meeting & Minutes (Minutes within seven (7) calendar days of meeting)**

### **8.3 Correspondence**

### **8.4 Submission Requirements**

- 8.4.1 A/E Statement of Site Visit
- 8.4.4 Site Evaluation
- 8.4.7 Photographs
- 8.4.8 Regulatory Agency Approvals (Include itemized list specific to this project)
- 8.4.10 Drawings: 6 sets
- 8.4.11 Specifications: 6 sets
- 8.4.12 Current Working Estimate in CSI Format & Cost Analysis 38 Form
- 8.4.13 Bar Chart of Design and Construction Schedule
- 8.4.14 Oral Presentation of this Submission to Project Team
- 8.4.15 Plan Review/SOW Compliance Statement
- 8.4.16 This Submission Checklist
- 8.4.17 Deliverables Submission in Booklet Form: 7 sets

### **8.5 Approvals**

- 8.5.1 Respond to Submission Comments

## **PERMIT APPLICATION PHASE**

This Permit Application Phase should not include any additional design issues. Design documents shall be 100% complete at the Final Design Phase.

### **8.6 Permit Application Submission Requirements**

- 8.6.1 - 8.6.7: If all of the deliverables of these sections have been previously submitted to DPMC and approved there are no further deliverables due at this time
- 8.6.8 Regulatory Agency Approvals
  - (a) UCC Permit Application & Technical Sub-codes completed by A/E
- 8.6.9 Utility Availability Confirmation
- 8.6.10 Signed and Sealed Drawings: 6 sets
- 8.6.11 Signed and Sealed Specifications: 6 sets
- 8.6.12 Current Working Estimate/Cost Analysis
- 8.6.13 Bar Chart Schedule
- 8.6.14 Project Presentation (N/A this Project)
- 8.6.15 Plan Review/SOW Compliance Statement
- 8/6.16 Submission Checklist

## **8.7 Approvals**

## **8.8 Submission Forms**

- Figure 8.4.12 Current Working Estimate/Cost Analysis
- Figure 8.4.16 Submission Checklist (Final Review Phase)
- Figure 8.6.12-b Bid Proposal Form (Form DPMC -3)
- Figure 8.6.12-c Notice of Advertising (Form DPMC -31)
- Figure 8.6.16 Submission Checklist (Permit Phase)
- Figure 8.7 Bid Clearance Form (Form DPMC -601)

## **BIDDING AND CONTRACT AWARD**

### **9.0 Bidding Phase Requirements**

- 9.01 Original Drawings signed & sealed by A/E and drawings on compact disk (CD) in *Adobe Portable Document Format (.pdf)*
- 9.02 One Unbound Specification Color Coded per A/E Manual Section 8.4.11 and specifications on compact disk (CD) in *Adobe Portable Document Format (.pdf)*
- 9.03 Bid Documents Checklist
- 9.04 Bid Proposal Form
- 9.05 Notice for Advertising

### **9.1 Chair Pre-Bid Conference/Mandatory Site Visit**

### **9.2 Prepare Bulletins**

### **9.3 Attend Bid Opening**

### **9.4 Recommendation for Contract Award**

- 9.4.1 Prepare Letter of Recommendation for Award & Cost Analysis
  - 9.5 Attend Pre-Construction Meeting**
  - 9.6 Submission Checklist**
  - 9.7 Submission Forms**
    - Figure 9.4.1 Cost Analysis
    - Figure 9.6 Submission Checklist
  - CONSTRUCTION PHASE**
  - 10.1 Site Construction Administration**
  - 10.2 Pre-Construction Meeting**
  - 10.3 Construction Job Meetings**
    - 10.3.1 Agenda: Schedule and Chair Construction Job Meetings
    - 10.3.2 Minutes: Prepare and Distribute Minutes within 5 working days of meeting
    - 10.3.3 Schedules; Approve Contractors' Schedule & Update
    - 10.3.4 Minutes Format: Prepare Job Meeting Minutes in approved format, figure 10.3.4-a
  - 10.4 Correspondence**
  - 10.5 Prepare and Deliver Conformed Drawings**
  - 10.7 Approve Contractors Invoicing and Payment Process**
  - 10.8 Approve Contractors 12/13 Form for Subs, Samples and Materials**
  - 10.10 Approve Test Reports**
  - 10.11 Approve Shop Drawings**
  - 10.12 Construction Progress Schedule**
    - 10.12.1 Construction Progress Schedule
  - 10.13 Review & Recommend or Reject Change Orders**
-



- 10.13.1 Scope Changes
- 10.13.2 Construction Change Orders
- 10.13.3 Field Changes

#### **10.14 Construction Photographs**

#### **10.15 Submit Field Observation Reports**

#### **10.16 Submission Forms**

- Figure 10.3.4-a Job Meeting Format of Minutes
- Figure 10.3.4-b Field Report
- Figure 10.6 DPMC Insurance Form-24
- Figure 10.6-a Unit Schedule Breakdown
- Figure 10.6-b Monthly Estimate for Payment to Contractor DPMC 11-2
- Figure 10.6-c Monthly Estimate for Payment to Contractor DPMC 11-2A
- Figure 10.6-d Invoice DPMC 11
- Figure 10.6-e Prime Contractor Summary of Stored Materials DPMC 11-3
- Figure 10.6-f Agreement & Bill of Sale certificate for Stored Materials DPMC 3A
- Figure 10.7-a Approval Form for Subs, Samples & Materials DPMC 12
- Figure 10.7-b Request for Change Order DPMC 9b
- Figure 10.9 Transmittal Form DPMC 13
- Figure 10.10 Submission Checklist

### **PROJECT CLOSE-OUT PHASE**

- 11.1 Responsibilities: Plan, Schedule and Execute Close-Out Activities**
  - 11.2 Commencement: Initiate Close-Out w/DPMC 20A Project Close-Out Form**
  - 11.3 Develop Punch List & Inspection Reports**
  - 11.4 Verify Correction of Punch List Items**
  - 11.5 Determination of Substantial Completion**
  - 11.6 Ensure Issuance of “Temporary Certificate of Occupancy or Approval”**
  - 11.7 Initiation of Final Contract Acceptance Process**
  - 11.8 Submission of Close-Out Documentation**
-

- 11.8.1 As-Built & Record Set Drawings, 3 sets AUTOCAD Discs Delivered to DPMC
- 11.8.2 (a) Maintenance and Operating manuals, Warranties, etc.: 7 sets each
  - (b) Guarantees
  - (c) Shop Drawings
  - (d) Letter of Contract Performance
- 11.8.3 Final Cost Analysis-Insurance Transfer DPMC 25
- 11.8.4 This Submission Checklist

### **11.9 Final Payment**

- 11.9.1 Contractors Final Payment
- 11.9.2 A/E Invoice and Close-Out Forms for Final Payment

### **11.10 Final Performance Evaluation of the A/E and the Contractors**

### **11.11 Ensure Issuance of a “Certificate of Occupancy or Approval”**

### **11.12 Submission Forms**

- Figure 11.2 Project Close-Out Documentation List DPMC 20A
- Figure 11.3-a Certificate of Substantial Completion DPMC 20D
- Figure 11.3-b Final Acceptance of Consultant Contract DPMC 20C
- Figure 11.5 Request for Contract Transition Close-Out DPMC 20X
- Figure 11.7 Final Contract Acceptance Form DPMC 20
- Figure 11.8.3-a Final Cost Analysis
- Figure 11.8.3-b Insurance Transfer Form DPMC 25
- Figure 11.8.4 Submission Checklist

---

## **XV.EXHIBITS**

---

The attached exhibits in this section will include a sample project schedule, and any supporting documentation to assist the Consultant in the design of the project such as maps, drawings, photographs, floor plans, studies, reports, etc.

**END OF SCOPE OF WORK**

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                                       | Rspn | Weeks |
|---------------------|---|------|-------|
| <b>&lt;PROJ&gt;</b> |   |      |       |
| <b>Design</b>       |   |      |       |
| 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   |       |
| CV3051              | 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 Submit for Constructability   | OCS  |       |

Sheet 1 of 3

Bureau of Design & Construction Services  
Routine Project

# Exhibit "A"

DBCA - TEST

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

© Primavera Systems, Inc.

| Activity ID                           | Description                                      | Respn | Weeks |   |   |   |
|---------------------------------------|--|-------|-------|---|---|---|
|                                       |  |       | 1     | 2 | 3 | 4 |
| CV2055                                | Review & Approve Final Design Submittal          | CM    |       |   |   |   |
| CV2056                                | Consolidate & Return Final Design Comments       | CM    |       |   |   |   |
| CV3060                                | Prepare & Submit Permit Application Documents    | AE    |       |   |   |   |
| CV3068                                | Prepare & Submit Bidding Cost Analysis (DPMC-38) | CM    |       |   |   |   |
| <b>Plan Review-Permit Acquisition</b> |  |       |       |   |   |   |
| CV4001                                | Review Constr. Documents & Secure UCC Permit     | PR    |       |   |   |   |
| CV4010                                | Provide Funding for Construction Contracts       | CA    |       |   |   |   |
| CV4020                                | Secure Bid Clearance                             | CM    |       |   |   |   |
| <b>Advertise-Bid-Award</b>            |  |       |       |   |   |   |
| CV5001                                | Advertise Project & Bid Construction Contracts   | CP    |       |   |   |   |
| CV5010                                | Open Construction Bids                           | CP    |       |   |   |   |
| CV5011                                | Evaluate Bids & Prep. Recommendation for Award   | CM    |       |   |   |   |
| CV5012                                | Evaluate Bids & Prep. Recommendation for Award   | AE    |       |   |   |   |
| CV5014                                | Complete Recommendation for Award                | CP    |       |   |   |   |
| CV5020                                | Award Construction Contracts/Issue NTP           | CP    |       |   |   |   |
| <b>Construction</b>                   |  |       |       |   |   |   |
| CV6000                                | Project Construction Start/Issue NTP             | CM    |       |   |   |   |
| CV6001                                | Contract Start/Contract Work (25%) Complete      | CON   |       |   |   |   |
| CV6002                                | Preconstruction Meeting                          | CM    |       |   |   |   |
| CV6003                                | Begin Preconstruction Submittals                 | CON   |       |   |   |   |
| CV6004                                | Longest Lead Procurement Item Ordered            | CON   |       |   |   |   |
| CV6005                                | Lead Time for Longest Lead Procurement Item      | CON   |       |   |   |   |
| CV6006                                | Prepare & Submit Shop Drawings                   | CON   |       |   |   |   |
| CV6007                                | Complete Construction Submittals                 | CON   |       |   |   |   |
| CV6011                                | Roughing Work Start                              | CON   |       |   |   |   |
| CV6012                                | Perform Roughing Work                            | CON   |       |   |   |   |
| CV6010                                | Contract Work (50%+) Complete                    | CON   |       |   |   |   |
| CV6013                                | Longest Lead Procurement Item Delivered          | CON   |       |   |   |   |
| CV6020                                | Contract Work (75%) Complete                     | CON   |       |   |   |   |

DFCA - TEST

Sheet 2 of 3

**Bureau of Design & Construction Services**  
Routine Project

# Exhibit 'A'

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

© Primavera Systems, Inc.

| 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

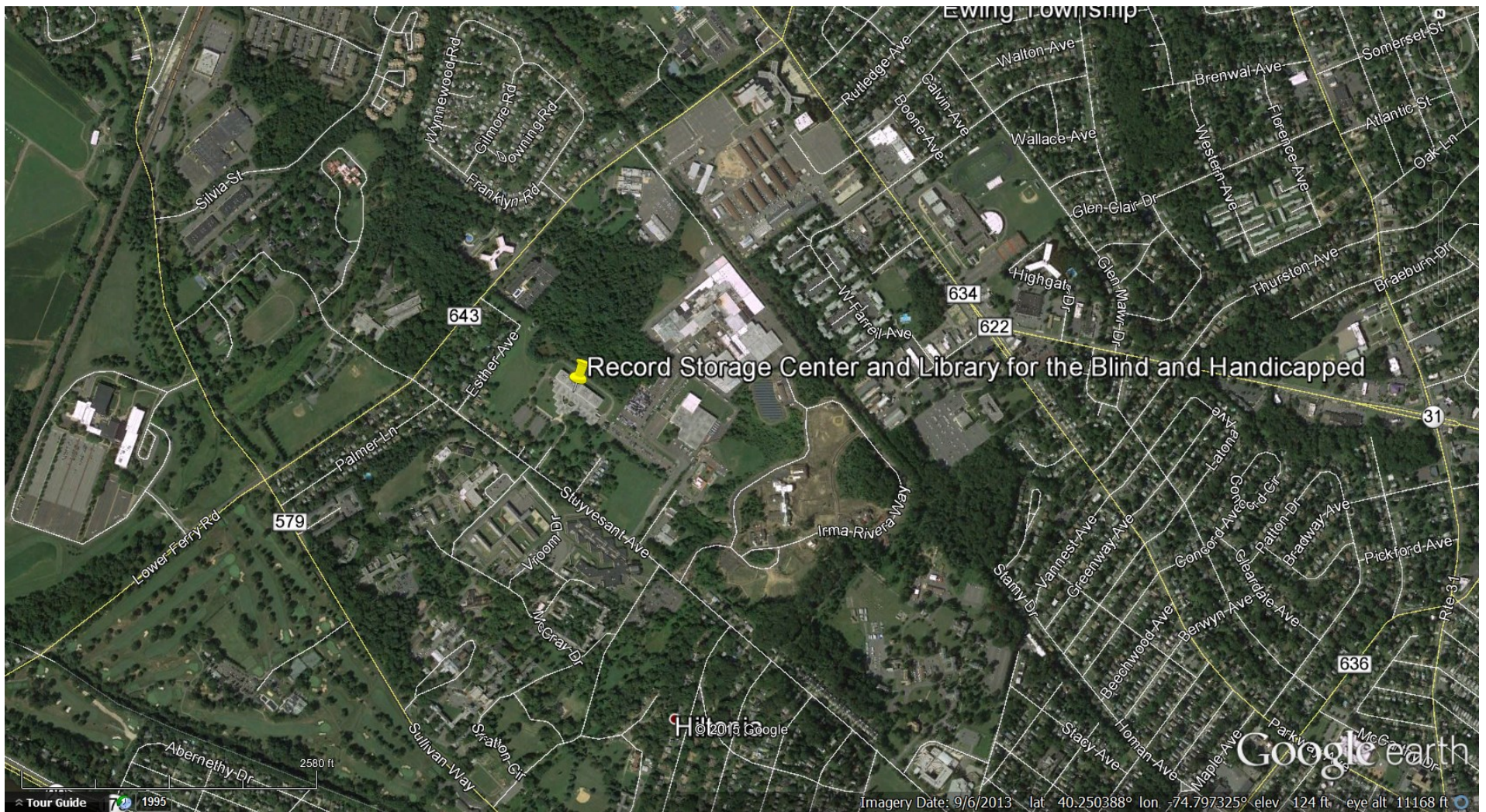
Sheet 3 of 3

Bureau of Design & Construction Services  
Routine Project

Exhibit 'A'

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

© Primavera Systems, Inc.



## Location Map

Record Storage Center and Library for the Blind and Handicapped

**EXHIBIT 'B'**

January 14, 2015

**PHASE I ROOF AUDIT**

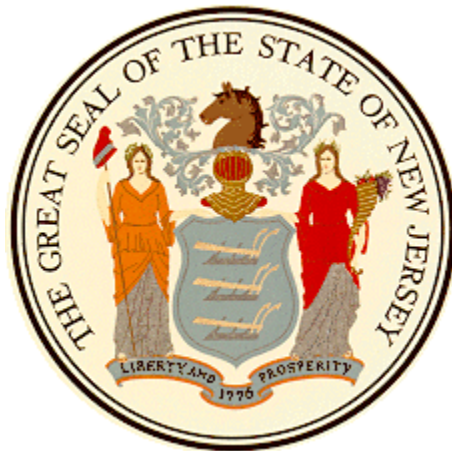
**RECORDS STORAGE CENTER  
2300 STUYVESANT AVENUE  
TRENTON, NJ 08618**

**DPMC AGENCY CONSULTANT CONTRACT NUMBER: J0319-00  
AGENCY WORK ORDER NUMBER: 01**

**prepared for**

**STATE OF NEW JERSEY**

**HONORABLE CHRIS CHRISTIE, GOVERNOR  
HONORABLE KIM GUADAGNO, LIEUTENANT GOVERNOR**



**DEPARTMENT OF THE TREASURY**

Andrew P. Sidamon-Eristoff, State Treasurer

**DIVISION OF PROPERTY MANAGEMENT AND CONSTRUCTION**

Steven Sutkin, Director

**Prepared by  
ARMM Associates, Inc.  
725 Kenilworth Avenue  
Cherry Hill, NJ 08002  
856-665-8484  
ARMM's Reference #14069**

**EXHIBIT 'C'**



**TABLE OF CONTENTS**

FOREWORD ..... 1

ROOF PLAN WITH LEAK LOCATIONS..... 2

EXECUTIVE SUMMARY ..... 3

EXISTING ROOF COMPOSITES AND ROOF AREA QUANTITIES..... 4

INVESTIGATION / ANALYSIS:

    DISCUSSION..... 5

    LEAKS ..... 5

    ROOF SYSTEM..... 6 - 7

    FIXED ROOF MOUNTED EQUIPMENT AND ROOF DRAIN ASSEMBLIES..... 8

    METAL WALL PANELS ..... 9

CONCLUSIONS ..... 10

RECOMMENDATIONS:

    ROOF SYSTEM..... 11 - 15

    WALL PANELS, EQUIPMENT AND WALKWAY PADS ..... 16

ESTIMATED CONSTRUCTION COSTS..... 17

PHOTOGRAPH LOCATION PLAN..... 18

FIELD OBSERVATION PHOTOGRAPHS ..... 19 - 50

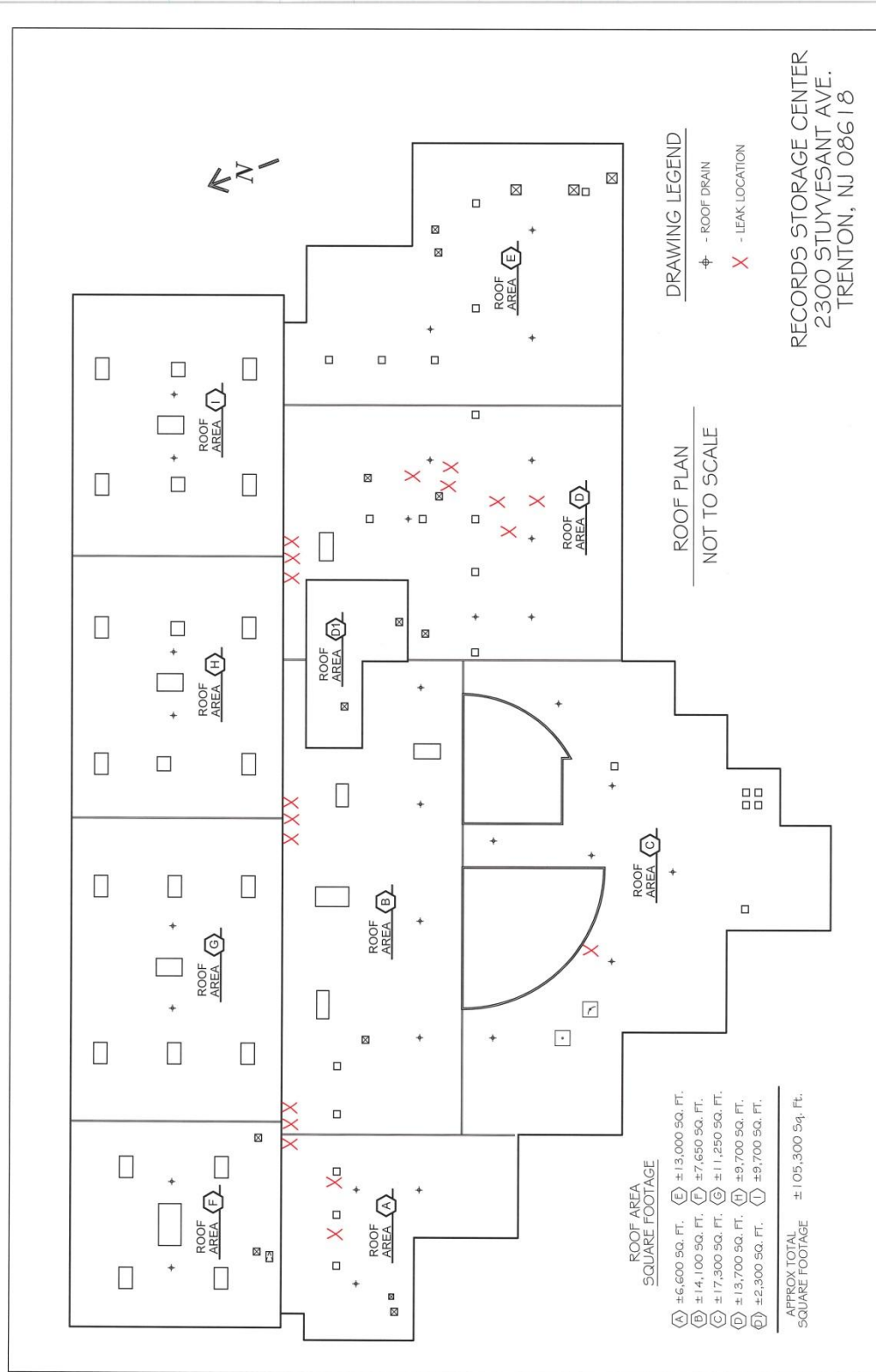
## **FOREWORD**

On Tuesday, January 13, 2015, a visit was made to Trenton, NJ by ARMM Associates, Inc. for the purpose of inspecting and evaluating the existing roof systems over the State of New Jersey Records Storage Center.

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. Roof area quantity and composition of each roof area.
3. Projected life expectancy of the existing roof systems in place.
4. Problem areas of the roof system and required repairs and/or maintenance.
5. Roof areas that are deteriorated to the degree that repairs are impractical and complete replacement is required.
6. Recommendations for repair and/or replacement.
7. Priority listing and budget cost for repairs and/or replacement.

The State of New Jersey Records Storage Center roof has been divided into ten (10) roof areas. Each roof area has been lettered and numbered, which are indicated on the enclosed roof plans. A pictorially illustrated report on existing conditions is included herein.



**EXHIBIT 'C'**

### **EXECUTIVE SUMMARY**

ARMM found the gravel surfaced built-up roofing system in place over the Record Storage Center to be in overall poor condition and has reached its life expectancy. Repairs are noted throughout the roof system over the facility. Core samples found the asphalt adhesive within the roofing membrane to be dried out and brittle.

ARMM found metal wall panels, which separate the lower roof from the upper roof, to be in overall poor condition. Overlapping seams were found to be open and the exposed mechanical fasteners securing the metal panels in place were found to be backing out and the rubber grommets used to make the fasteners watertight to the panels are deteriorated and dried out.

At this time ARMM recommends total removal of the existing roofing system down to the metal deck substrate. The existing metal deck substrate should be examined and any deteriorated sections of the metal deck be replaced. End laps and side laps should be checked and all loose sections resecured.

ARMM recommends a two layer flat and tapered insulation system be installed over the facility. The base layer of insulation should be mechanically fastened to the metal deck with the top layer set in adhesive to the base layer. The new roof system should be designed in the manner to provide a minimum average R-value of 25 in accordance with the latest edition of the International Energy Conservation Code.

Three basic roof system options come into play when considering a roof system for this facility which would include a modified bitumen roof membrane system (Option #1), a white single ply fleece back membrane system utilizing foam adhesive (Option #2) and a white non-fleece back single ply membrane system full adhered in applications of low VOC bonding adhesive (Option #3). Within the Recommendation section of this report, ARMM outlines the advantages and disadvantages of each of the three (3) options listed herein.

Repairs to the existing metal wall panels would include total removal of the existing wall panels, provision for a new single-ply waterproofing membrane be provided over the wall substrate behind the panels. The panels would be reinstalled with new fasteners with rubber washers with the overlapping seams of the metal panels set in butyl rubber tape.

ARMM found the skylight unit assemblies to be part of the original construction and have been repaired on numerous occasions. New skylight assemblies should be provided with appropriate fall protection during roof replacement.

Within the Estimated Construction Cost section of this report, ARMM lists each construction estimate for each of the three (3) roofing options. Under Option #1, modified bitumen roofing system set in asphalt, the estimated construction costs would be approximately \$3,159,990.00. Under Option #2, white single ply fleece back membrane system utilizing foam adhesive, the estimated construction costs would be \$2,854,620.00. Under Option #3, white non-fleece back single ply membrane system full adhered in applications of low VOC bonding adhesive, the estimated construction costs would be \$2,744,056.00.

**EXISTING ROOF COMPOSITES AND ROOF AREA QUANTITIES**

**Existing Roof Compositions:**

**Roof Areas A, B, C, D, E, F, G, H, and I**

- Marble chip set in a pour of asphalt
- 4-ply fiberglass felt built-up roof membrane, set in asphalt
- 1/2" thick flat perlite insulation, set in asphalt
- 2-1/2" thick flat combination insulation board (2" thick isocyanurate/ 1/2" thick perlite), mechanically fastened
- Metal deck

**Roof Area D1**

- Marble chip set in a pour of asphalt
- 4-ply fiberglass felt built-up roof membrane, set in asphalt
- 1/2" thick flat perlite insulation, set in asphalt
- 2-1/2" thick flat combination insulation board (2" thick isocyanurate/ 1/2" thick perlite), set in asphalt
- Concrete deck

**Roof Area Quantity**

|  |                           |
|--|---------------------------|
| Roof Area A .....                          | +/- 6,600                 |
| Roof Area B .....                          | +/- 14,100                |
| Roof Area C .....                          | +/- 17,300                |
| Roof Area D .....                          | +/- 13,700                |
| Roof Area D1 .....                         | +/- 2,300                 |
| Roof Area E .....                          | +/- 13,000                |
| Roof Area F .....                          | +/- 7,650                 |
| Roof Area G .....                          | +/- 11,250                |
| Roof Area H .....                          | +/- 9,700                 |
| Roof Area I .....                          | <u>+/- 9,700</u>          |
| <b>Total approximate square feet .....</b> | <b><u>+/- 105,300</u></b> |

### **DISCUSSION**

ARMM Associates, Inc. was able to secure original drawings for the facility. These drawings included structural, mechanical and site work; however, architectural drawings were missing from the package.

Based on these original drawings secured from the DPMC, the original building was constructed in 1981. The building is comprised of masonry bearing wall construction with structural steel framing supporting a steel roof deck substrate. Positive slope,  $\pm 1/4$ " per foot, was built into the steel framing. ARMM's survey noted only a few locations where ponding water exists. All sections of the building incorporate interior drain lines to evacuate rainwater from the roof surface. An aggregate surface built-up roofing system with insulation is provided over the metal deck substrate.

For ease of discussion, ARMM has divided the existing roofs into ten (10) separate roof areas divided by high walls and expansion joints. Each roof has been lettered and numbered which are indicated on the attached roof plan.

### **LEAK INVESTIGATION**

ARMM Associates, Inc. walked the interior of the building with the Building Manager, Mr. Joe Hendrickson. Mr. Hendrickson showed ARMM stained ceiling tiles below Roof Area A and below Roof Area D. Leakage below Roof Area D is so excessive that a combination of tarps, hoses, and containers are used to catch water entering the building in this area. Mr. Hendrickson then walked ARMM Associates, Inc. along the corridor separating the lower Roof Areas A through and including E from upper Roof Areas F through and including I. Leaks were reported flowing down the concrete block wall separating these two roof elevations.

Mr. Hendrickson noted the corridor leakage running down the wall has been happening for a long time and corresponds to the metal wall panels above. Following the earthquake in August 2011, the leakage became worse as the metal wall panel openings at the seams increased from the earthquake.

According to Mr. Hendrickson, once leaks are noted within the facility, the State is contacted and a roofer responds to the leaks. ARMM noted during our investigation many repairs throughout the building roofs. It is ARMM's opinion that leaks within in the facility would be more severe if not for the repair work performed over the years.

Another item of note from conversations with Mr. Hendrickson, he noted that the overlapping seams of the metal deck opened at a number of locations as their spot welds failed from the earthquake. Mr. Hendrickson noted this during renovation to the building.

### ROOF INVESTIGATION

A visual examination of the roof surface and subsequent analysis of core samples found existing roofs on all roof areas incorporate marble chip aggregate surfacing set in a pour of asphalt, to a 4-ply fiberglass felt built-up roofing membrane set in asphalt, over the insulation system. The insulation system consists of 1/2"-thick perlite insulation set in hot asphalt over 2-1/2"-thick flat combination board. The combination board consists of 2"-thick isocyanurate insulation with a bottom layer of 1/2"-thick perlite insulation. The perlite side of the combination board was laid over the deck substrate. The combination board insulation was mechanically fastened to the metal deck substrates at all roof areas except Roof Area D1, which incorporates a concrete deck substrate, where the combination board was set in asphalt to the concrete deck.

The exact age of the aggregate surfaced roofing system is unknown. However, Mr. Hendrickson has been working in the Records Storage Center for over 20 years and for the State for almost 30 years. The roof has not been replaced during his time at the Record Storage Center. Therefore, the existing roof is over 20 years old.

During core sampling and examination of the samples in ARMM's laboratory, the built-up roofing samples extracted from the field of the roof were found to be brittle. The individual felt layers of the 4-ply built-up roofing membrane can easily be pulled apart. This indicates that the inner plies of the asphalt have dried out and limited adhesion of the felts is now present. Limited waterproofing properties of the built-up roof are noted.



ARMM noted good adhesion of the 1/2"-thick perlite insulation to the combination board. ARMM was able to examine the underside of the metal deck substrate at a number of locations. ARMM noted a normal amount of mechanical fasteners used to secure the combination board to the metal deck substrate required 20 to 25 years ago, as per Factory Mutual requirements. However, these requirements have been updated to include additional fastener requirements over the last 20 years. Attachment of the combination board at Roof Area D1, which incorporates a concrete deck, was set in a solid mopping of asphalt. ARMM found the combination board in this area to be difficult to remove from the concrete deck substrate, which would indicate that the adhesion of the combination board to the concrete deck is excellent.

Perimeter parapet walls, expansion joint curbs, and equipment curbs are flashed with two-ply flashings, which includes fiberglass felt and one-ply granular surfaced modified flashing sheet set in hot asphalt. ARMM's evaluation found almost all overlapping seams of the top ply granular surfaced modified bitumen flashing sheet have been repaired with roof cement. When examining the base flashings, it was found that during the original construction of the roofing system, cant strips were not provided at the transition from the built-up roofing membrane to the curbs. The cant strip, when applied,



provides a smooth transition from the roofing membrane to the curb substrate. ARMM noted locations where, since the cant strip is missing, roof cement repairs were required at the 90° angle where the flashing transitions onto the built-up roofing membrane.

Walkway pads to equipment were observed on the roof. Walkway pads have deteriorated and cracked. Perimeter gravel stop flashing was examined. A general drying-out and cracking of the asphalt was noted. Continuous roof cement repairs were provided at a number of locations throughout the facility. Common locations include gravel stop butt joints and wall and expansion joint intersections.



**FIXED ROOF MOUNTED EQUIPMENT INVESTIGATION**

ARMM found the existing ventilator fans, HVAC units, and roof hatch to be in overall good condition. However, there is one ventilator unit on Roof Area D1 which is in overall poor condition. Roof cement has been spread over the ventilator housing to keep it watertight. Individual skylight units were examined. ARMM found many skylight units which have been repaired with continuous beads of sealant at the transition from the metal framing to the plastic domes. This sealant is now starting to dry out. All fasteners at the metal frame have applications of caulking applied to make them watertight. In turn, this caulking is also drying out over the fasteners.



**ROOF DRAIN ASSEMBLIES AND SUMPED AREA INVESTIGATION**

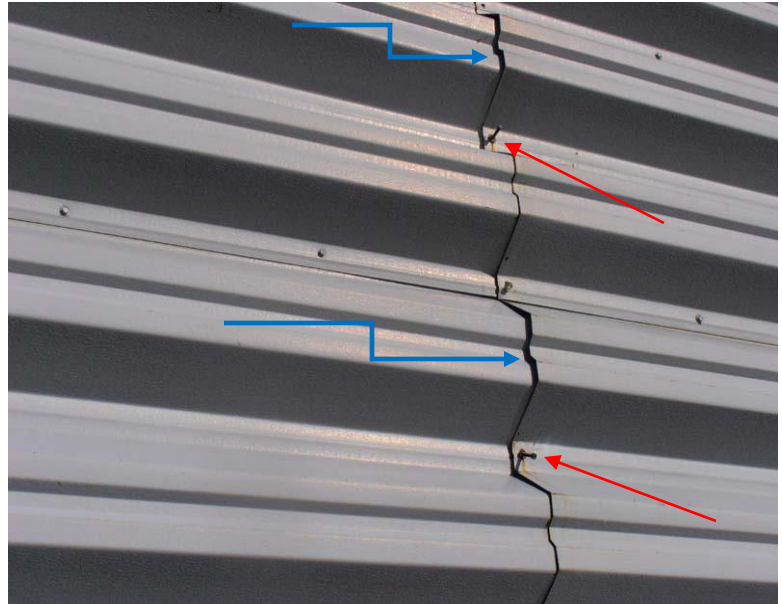
Existing roof drain assemblies and the sumped areas around the roof drains were examined. The built-up roofing membrane is exposed at the transition from the insulation to the tapered insulation sump area. The general drying out of the built-up roofing membrane top asphalt pour is noted at this transition, and there are a number of areas where blisters have developed at the transition. Repairs were noted at a number of locations where the roof membrane transitions underneath the drain clamping rings.



It would appear that an adequate amount of drainage sources and the capacity has been provided to drain the amount of roof area for this facility. However, overflow drainage sources were not provided on any roof area in the form of overflow scuppers at perimeter walls, or secondary drainage systems within the field of the roof.

**METAL WALL PANEL INVESTIGATION**

A review of the building's metal wall panels to determine their watertight integrity. The metal wall panels from Roof Areas A, B, C, D, and E to the upper roof areas F through I were examined. These metal panels extend around the entire perimeter over outside walls on all four (4) sides. A visual inspection showed the overlapping seams of the metal panels are now open. Gaps vary from 1/16" to 1/2" (note blue arrows in adjacent photograph identifying this condition). Mechanical fasteners securing the metal panels to the substrate behind are backing out and could be removed by hand (note red arrows in adjacent photograph identifying typical locations of this condition). ARMM reviewed the original drawings for the facility to verify the wall construction. Unfortunately, architectural drawings were not in the original drawing package. Therefore, ARMM is unable to verify the substrate behind the metal wall panels. A closer examination of the metal fasteners found the rubber grommets used to make the fasteners watertight are drying out, deteriorated and brittle. At other locations the heads of the mechanical fasteners have been caulked with silicone sealant.



Maintenance personnel mentioned these panels have been a problem since original construction. Gaps at overlapping seams have been an ongoing problem. These gaps became worse following the earthquake in August 2011.

## **CONCLUSIONS**

The information gathered during ARMM's survey of the aggregate surfaced built-up roofing system over the Records Storage Center in Trenton, NJ has allowed ARMM to produce an accurate assessment of its overall condition. Consequently, conclusions can be formulated about the existing gravel surfaced built-up roof installed over 20 years ago.

From ARMM's inspection, the gravel surfaced built-up roofing system in place over the Records Storage Center is in overall poor condition. When installed in a good workmanship manner, aggregate surfaced built-up roofing systems of this kind have a normal life expectancy of 20 years. From conversations with in-house personnel, leakage has developed throughout the facility; however, over the years once a leak developed a roofer is dispatched to stop the leakage. The roofing system is now at a point where leaks, which have developed within individual roof areas, cannot be stopped because of the condition of the roof. This was noted in particular at Roof Area D. Multiple repairs were performed within the field of the roof and to equipment flashing to try to stop the leaks but to no avail.

From core samples extracted from individual roof areas, ARMM found the asphalt adhesive within the top pour and in between individual plies to be dried out and brittle. ARMM noted the drying out and cracking of the asphalt top pour within areas of the built-up roofing membrane where it was exposed where no gravel was present. During laboratory analysis, ARMM found that individual plies of the fiberglass felt were easily peeled apart by hand, which would indicate the asphalt coating between individual plies is dried out and incorporates limited adhesive value and no longer has waterproofing properties.

All overlapping seams and corners of base flashings at equipment and expansion joint curbs have been repaired with roof cement. The roof cement used to repair seams and curbs are only a temporary fix and will require additional applications of roof cement spread over the surface every two to three years. The leaks below Roof Areas A and D are directly related to the drying out and general deterioration of the built-up roofing system in the field of the roof.

### **Metal Wall Panels:**

ARMM's inspection of the metal wall panels that separate the lower roofs from the upper roofs found the panels to be in overall poor condition. The overlapping seams of the metal panels are now open to the elements. Gaps vary from 1/6" to 1/2". Mechanical fasteners securing the metal panels to the substrate behind are backing out and the rubber grommets used to make those fasteners watertight to the metal panel are deteriorated. It is the opinion of ARMM Associates, Inc. that the leaks along the corridor are directly related to the deficiencies within these metal wall panels.

**RECOMMENDATIONS - ROOF SYSTEM**

At this time, because of the age of the roof system, leaks experienced over the years within the facility, repairs performed to the field of the roof and at flashing locations, and the degree of drying out and limited adhesion of the asphalt waterproofing within the core samples, ARMM recommends total removal and replacement of the existing roof once funding can be made available. It is the opinion of ARMM Associates, Inc. that if the existing aggregate surfaced built-up roof is not replaced within the next couple of years, excessive leakage into the facility may become widespread.

Once the existing roof system is removed, the metal deck substrate should be examined. Deteriorated sections of the metal deck should be replaced in kind. End laps and side laps should be checked. All loose sections should be resecured.

Selection of a replacement roofing system for this facility is dependent upon numerous factors to include, but not necessarily limited to, building occupancy during construction, site staging parameters, building configurations, and drainage. The three basic roofing systems come to play when considering a roof system for this facility, which would include a built-up roofing membrane system, a white single-ply fleece backed membrane system utilizing foam adhesive, and a white non-fleece backed single-ply membrane system fully adhered in applications of low VOC bonding adhesive.

All three options would incorporate flat insulation over the existing metal and concrete deck substrates. Tapered insulation should be provided at areas of the roof that ponds. The base layer of insulation should be mechanically fastened to the metal deck substrate and set in adhesive to concrete deck substrates. A second layer of flat insulation should be provided over the base layer to divorce the mechanical fasteners and plate from the membrane and to provide a suitable substrate for the new membrane. The proposed new insulation system should be designed in a manner to provide minimum average "R" values of 25 in accordance with the latest edition of International Energy Conservation Codes.

Roof system options incorporating the prescribed insulation system are as follows:

**OPTION #1:**

**Modified Bitumen Roof Membrane System - Asphalt**

Install 3-ply fiberglass felt membrane set and bonded with steep asphalt with a mineral surfaced SBS fire rated modified bitumen capsheet set in asphalt.

**LEED Information:**

|    |                              |      |
|----|------------------------------|------|
| A. | Solar Reflectance.....       | 0.72 |
| B. | Thermal Emittance.....       | 0.92 |
| C. | Solar Reflectance Index..... | 89.0 |

**Advantages:**

- A. Membrane manufacturers warrant this system for periods up to 20 years.
- B. Redundancy in the installation of the multiple-plyes increases the margin for error during application.

- C. SBS modified bitumen cap sheet is flexible and not susceptible to splitting associating with temperature fluctuations.
- D. Smooth surfaced cap sheet is puncture resistant and can withstand routine foot traffic and equipment maintenance.
- E. The nature of the smooth surfaced cap sheet makes it easy to track down leaks as well as perform future equipment penetration flashings.
- F. There are several manufacturers of this type of system, creating a competitive atmosphere in the pricing of materials.
- G. With a greater quantity of manufacturers there exist a greater number of approved applicators to create a competitive bidding atmosphere.
- H. Membrane surface is not slippery when wet.

**Disadvantages:**

- A. Although not currently considered a carcinogen, the fumes of asphalt during the heating and application process are still a major issue when being utilized on an occupied building. It is for this reason that estimated construction costs herein include the cost of providing fume recovery systems.
- B. Due to the building's configuration, ground staging areas for tankers and/or kettle will have to occur at two (2) to three (3) separate locations around the building.
- C. Composite flashing inability to conform to angle changes creates a much more complex flashing system at curbs and roof perimeters.
- D. Materials ability to flash limited wall heights will require special consideration in flashing vertical walls at parapets.
- E. As with aggregate surfaced built-up roof membranes granular surfacing of modified bitumen sheets are also susceptible to scour from wind and roof drainage.
- F. This composite weighs three (3) times as much as the proposed single-ply systems.
- G. The most expensive system of the three (3) proposed roof options.
- H. Lowest solar reflectance values of the three (3) proposed roof options.

**Totals - Option No. 1 Modified Bitumen Roof Membrane System - Asphalt**

|    |                     |   |
|----|---------------------|---|
| A. | Advantages .....    | 8 |
| B. | Disadvantages ..... | 8 |

**OPTION NO. 2**

**White Single-Ply Membrane – Fleece-Back TPO / PVC / EPDM**

Install an adhered .060” thick fire-rated fleece-back membrane (TPO / PVC / EPDM) system set in foam adhesive to the surface of the previously proposed insulation system.

**LEED Information:**

|    |                              |               |
|----|------------------------------|---------------|
| A. | Solar Reflectance.....       | 0.81 - 0.83   |
| B. | Thermal Emittance.....       | 0.92 - 0.95   |
| C. | Solar Reflectance Index..... | 102.0 - 105.0 |

**Advantages**

- A. Membrane manufactures warrant these systems for period up to 20 years.
- B. Roof system composite is extremely light in weight, weighing less than the roof system currently in place.
- C. There are several manufacturers of these types of systems creating a competitive atmosphere in the pricing of materials.
- D. With a greater quantity of manufacturers, there exist a greater number of approved applicators to create a competitive bidding atmosphere.
- E. The fleece-back membrane system is the second least expensive system to install of the three (3) proposed systems.
- F. This system can be installed with limited ground staging areas with facility personnel barely even noticing that roofing operations are in progress.
- G. Excessive fumes would be non-existent with field sheets set in foam adhesive.
- H. Membrane surface is not susceptible to scour.
- I. With underlying hardboard the fleece-back membrane is less susceptible to membrane puncture from foot traffic and roof top equipment maintenance.
- J. Exposed membrane and flashing surfaces allow for easy detection of reported leaks.
- K. Existing building configuration would allow for the installation of large field sheets with limited field membrane splices.
- L. Existing roof mounted equipment can be reused with equipment being shut down for no more than one (1) day in any given area of replacement.

**Disadvantages**

- A. Although all manufacturers have Factory Mutual I90 wind up-lift approval in excess of design wind speeds of 100 mph, these manufacturers still will not guarantee this roofing system for wind gusts in excess of 75 miles per hour.
- B. Greater importance of good workmanship during lap seam fabrication which as previously described would be limited due to existing building configuration.
- C. Fumes associated with bonding adhesive installation at details would be noticeable at roof level with these fumes possibly migrating down to lower occupied spaces through air intakes. This could be corrected by temporarily shutting down air-intakes at any given portion of the roof being worked on in any given day.
- D. White single-ply roof membrane surfaces are extremely slippery when wet necessitating additional precautions in regards to providing non-skid protection pads around roof perimeters.

**Totals - Option No. 2 (Fleece-Back Single Ply):**

- A. Advantages ..... 12
- B. Disadvantages ..... 4

**OPTION NO. 3**

**White Single-Ply Membrane – Smooth-Back Fully Adhered in Bonding Adhesive, TPO / PVC / EPDM**

Install a fully adhered smooth backed .060” thick fire-rated white membrane system fully adhered to the surface of the previously proposed insulation system in bonding adhesive.

**LEED Information:**

- A. Solar Reflectance ..... 0.81 - 0.83
- B. Thermal Emittance ..... 0.92 - 0.95
- C. Solar Reflectance Index ..... 102.0 - 105.0

**Advantages**

- A. Membrane manufacturers warrant this system for period up to 20 years.
- B. Roof system composite is extremely light in weight.
- C. There are several manufacturers of this type of system creating a competitive atmosphere in the pricing of materials.
- D. With a greater quantity of manufacturers, there exists a greater number of approved applicators to create a competitive bidding atmosphere.
- E. The fully adhered smooth backed membrane system is the least expensive system to install of the three (3) proposed systems.
- F. This system can be installed with limited ground staging areas with facility personnel barely even noticing that roofing operations are in progress.

- G. Flexible membrane material conforms readily to angle changes.
- H. Material has an unlimited flashing height which would readily conform to parapet walls.
- I. Membrane surface is not susceptible to scour.
- J. Subsequent equipment penetrations can easily be flashed into the existing membrane surface.
- K. Exposed membrane and flashing surfaces allow for easy detection of reported leaks.
- L. Existing building configuration would allow for the installation of large field sheets with limited field membrane splices.
- M. Existing roof mounted equipment can be reused with equipment being shut down for no more than one (1) day in any given area of replacement.

**Disadvantages**

- A. Although all manufacturers have Factory Mutual wind up-lift approvals in excess of design wind speeds of 110 mph, these manufacturers still will not guarantee this roofing system for wind gusts in excess of 75 miles per hour.
- B. Greater importance of good workmanship during lap seam fabrication which as previously described would be limited due to existing building configuration.
- C. Fumes associated with low VOC adhesive installation in the field of the roof and at details would be noticeable at roof level with these fumes possibly migrating down to lower occupied spaces through air intakes. This could be corrected by temporarily shutting down air-intakes at any given portion of the roof being worked on in any given day.
- D. White membranes are slippery when wet.
- E. Non fleece-back membranes are the most susceptible to membrane puncture.

**Totals - Option No. 3 (White Smooth Back Fully Adhered Membrane):**

|    |                     |    |
|----|---------------------|----|
| A. | Advantages .....    | 11 |
| B. | Disadvantages ..... | 5  |



## **RECOMMENDATIONS**

### **Existing Metal Wall Panels**

Included within the new roof replacements, ARMM recommends that the existing walls panels receive remedial repairs to make them watertight. The remedial repairs should include total removal of the existing metal panels and then reinstallation. Prior to reinstallation, a single-ply waterproofing membrane should be provided over the wall substrate prior to reinstalling the metal wall panels. All screw-type fasteners with rubber washers attaching the metal panels to the substrate behind should be removed and replaced with oversized screw-type fasteners with rubber washers. At overlapping seams, butyl rubber tape should be provided within the overlapping seams and new oversized screw-type fasteners with rubber washers provided at original hole locations. Proper detailing should also be provided at the base of the metal panels at wall expansion joint locations and at gravel stops above at the panel terminations.

### **Roof Top Equipment**

ARMM Associates, Inc. recommends replacement of all skylight unit assemblies which have received caulk repairs over the years. New skylight unit assemblies should be provided with appropriate fall protection.

Rooftop ventilator units should be examined. Units with roof cement applications, which was provided to make them water tight, should be replaced.

### **Walkway Pads**

As part of the roof replacement, new roof walkways should be provided running from roof access doors and roof hatches to all serviceable equipment.

**2015 ESTIMATED CONSTRUCTION COSTS OF RECOMMENDED ROOFING SYSTEM OPTIONS**

**OPTION #1: Modified Bitumen Roof Membrane System - Asphalt**

|                               |                       |
|-------------------------------|-----------------------|
| Roof Area A .....             | \$186,780.00          |
| Roof Area B .....             | \$399,030.00          |
| Roof Area C .....             | \$489,590.00          |
| Roof Area D .....             | \$387,710.00          |
| Roof Area D1 .....            | \$65,090.00           |
| Roof Area E .....             | \$367,900.00          |
| Roof Area F .....             | \$216,495.00          |
| Roof Area G .....             | \$318,375.00          |
| Roof Area H .....             | \$274,510.00          |
| Roof Area I .....             | \$274,510.00          |
| Metal Wall Panel Repair ..... | \$180,000.00          |
| <b>Total .....</b>            | <b>\$3,159,990.00</b> |

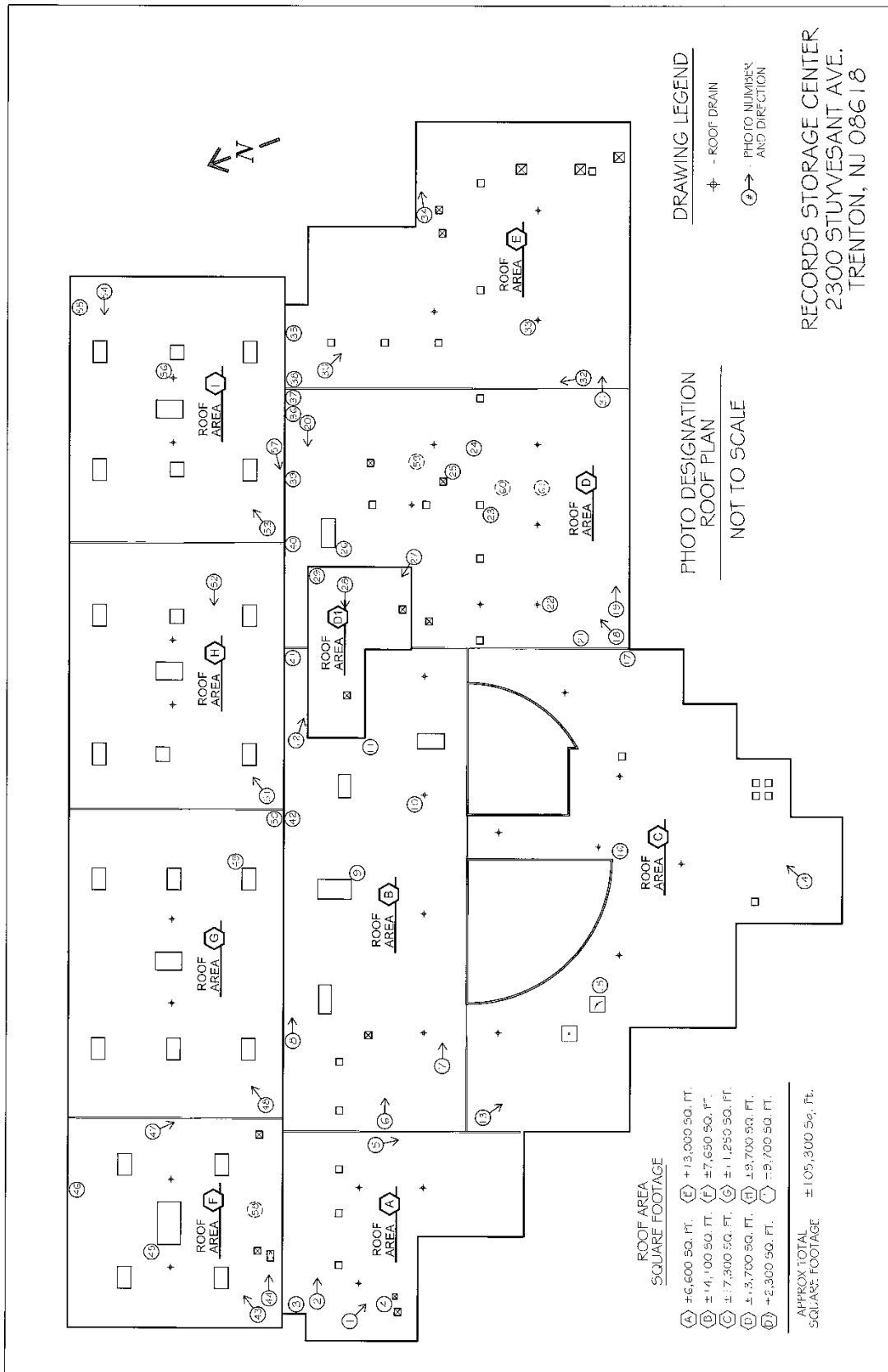
**OPTION #2: White Fleece Back Single Ply Membrane - TPO / PVC / EPDM**

|                               |                       |
|-------------------------------|-----------------------|
| Roof Area A .....             | \$167,640.00          |
| Roof Area B .....             | \$358,140.00          |
| Roof Area C .....             | \$439,420.00          |
| Roof Area D .....             | \$347,980.00          |
| Roof Area D1 .....            | \$58,420.00           |
| Roof Area E .....             | \$330,200.00          |
| Roof Area F .....             | \$194,310.00          |
| Roof Area G .....             | \$285,750.00          |
| Roof Area H .....             | \$246,380.00          |
| Roof Area I .....             | \$246,380.00          |
| Metal Wall Panel Repair ..... | \$180,000.00          |
| <b>Total .....</b>            | <b>\$2,854,620.00</b> |

**OPTION #3: Single Ply Membrane NON-Fleece Back - TPO / PVC / EPDM**

|                               |                       |
|-------------------------------|-----------------------|
| Roof Area A .....             | \$160,710.00          |
| Roof Area B .....             | \$343,335.00          |
| Roof Area C .....             | \$421,255.00          |
| Roof Area D .....             | \$333,595.00          |
| Roof Area D1 .....            | \$56,005.00           |
| Roof Area E .....             | \$316,550.00          |
| Roof Area F .....             | \$186,278.00          |
| Roof Area G .....             | \$273,938.00          |
| Roof Area H .....             | \$236,195.00          |
| Roof Area I .....             | \$236,195.00          |
| Metal Wall Panel Repair ..... | \$180,000.00          |
| <b>Total .....</b>            | <b>\$2,744,056.00</b> |

In regards to escalating construction costs, it has been ARMM's experience that roof costs would, by necessitating, have to be updated 5% to 7% each year; hence cost estimates for replacement reflect these projected increases.



**EXHIBIT 'C'**

**FIELD OBSERVATION PHOTOGRAPHS**

**EXHIBIT 'C'**



1. Overall photograph of the aggregate surfaced built-up roofing system over Roof Area A. The existing roof system incorporates white spar aggregate surfacing set in asphalt to a 4-ply fiberglass felt built-up roofing membrane set in asphalt. The insulation system consists of 1/2" perlite insulation set in asphalt over a 2-1/2" combination board mechanically fastened to the metal deck substrate. The combination board consists of 2" of isocyanurate insulation and 1/2" perlite insulation.



2. An additional overall photograph of Roof Area A. Roof Area A incorporates excellent slope, pitching in multiple directions to existing roof drain assemblies. The slope of the roof area is built into the structure.

## EXHIBIT 'C'



3. Photograph at the perimeter of Roof Area A. This photograph shows two repairs utilizing roof cement. The first repair is at an overlapping seam of the gravel assembly, while the second repair is at the building corner where it intersects the vertical wall.



4. This photograph illustrates some of the repairs to the base flashings at ventilator curb locations on Roof Area A. All corners of the base flashings have been repaired with roof cement. It should also be noted that during original construction, cant strips were not provided.

## EXHIBIT 'C'



5. Overall photograph of the expansion joints between Roof Areas A and B. Please note that all the overlapping seams of the base flashings have been repaired with roof cement.



6. Overall photograph of the gravel surface built-up roofing system on Roof Area B. Core sampling found that this roof area incorporates the same roof composite as Roof Area A.

## **EXHIBIT 'C'**



7. Overall photograph of the aggregate surfaced built-up roofing system on Roof Area B. During core sampling ARMM found the built-up roofing membrane, which was set in asphalt, to be brittle and could be easily pulled apart.



8. This photograph notes some of the deficiencies of the wall expansion joint. The overlapping seams of the base flashings have been repaired with roof cement. The overlapping seams of the metal expansion joint cover have been repaired with strips of EPDM roofing material.

## EXHIBIT 'C'





9. Overall photograph showing some of the deficiencies at one of the large HVAC units on Roof Area B. Please note the cinder block supports are sitting directly on the surface of the built-up roofing membrane. Also note the corner of the HVAC curb has been repaired with roof cement. ARMM's examination of the curb at this HVAC unit showed all overlapping seams and corners repaired with roof cement.



10. A photograph of a roof drain location on Roof Area B. Please note that small blisters have developed at the transition from the flat insulation to the insulation sump area. It should also be noted that the roofing membrane is exposed at the transition. The asphalt coating over the built-up roofing membrane has dried out and has started to crack.

## EXHIBIT 'C'



11. Photograph of the wall expansion joint leading from Roof Area B to Roof Area D1. Please note the repairs to the base flashings at the building corner, as well as repairs at overlapping seams.



12. Overall photograph of the wall expansion joint from Roof Area B leading to Roof Area D1. During the original construction, cant strips were not installed to provide a smooth transition from the roof surface to the curb. Therefore, over time, splits developed at the angle change. Roof cement repairs were required along the entire length of the wall expansion joint curb.

## EXHIBIT 'C'



13. Overall photograph of the aggregate surface built-up roofing system at Roof Area C. The roof incorporates excellent slope which was built into the structure.

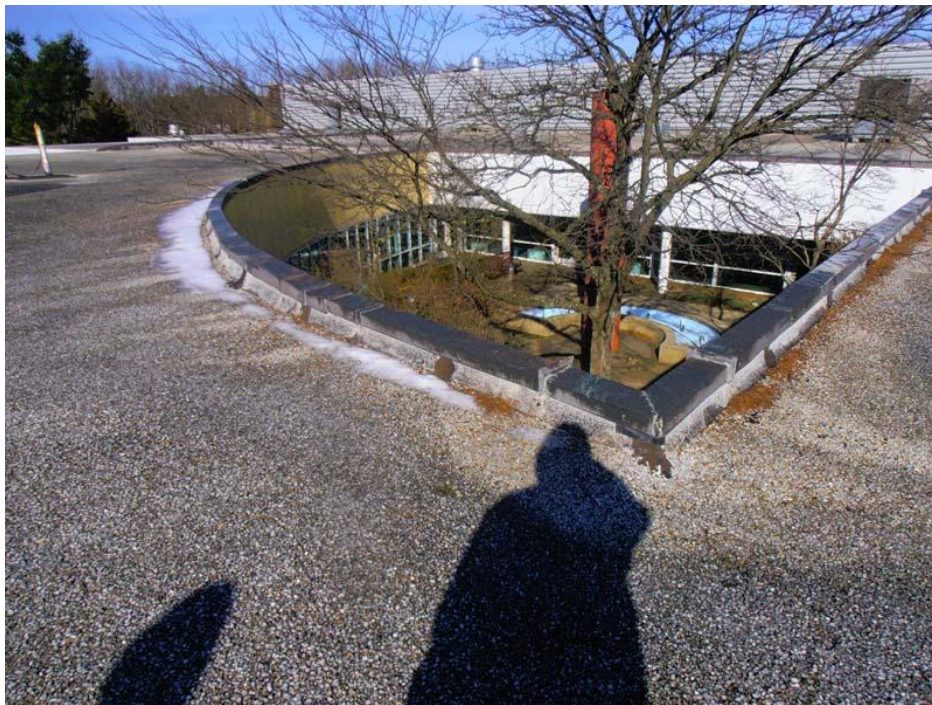


14. An additional overall photograph of Roof Area C. During core sampling ARMM found the 4-ply felt built-up roofing membrane to be in brittle. The asphalt coating between layers of the fiberglass felt has dried out and the roofing membrane can be easily peeled apart.

## EXHIBIT 'C'



15. In this photograph the large asphalt repairs were applied to the surface of the built-up roofing membrane. The aggregate surfacing used to protect the membrane was brushed aside to repair the surface of the built-up roofing membrane. The repairs in this area are starting to dry out.



16. Photograph of the perimeter parapet wall. Please note roof cement repairs to the base flashings at the building corner, as well as overlapping seams along the entire length. This is typical throughout the entire facility.

## EXHIBIT 'C'



17. Photograph of an expansion joint corner from Roof Area C to Roof Area D. The exposed flashings and membrane in this area deteriorated; therefore, asphalt repairs were required at the termination of the expansion joint curb. Please note that all overlapping seams of the base flashings at the expansion joints have been repaired. In addition, the overlapping seams of the copper expansion joint cap have been repaired with roof cement as well.



18. Overall photograph of the aggregate surfaced built-up roofing system over Roof Area D. The roof does incorporate good slope built into the structure; however, during core sampling ARMM noted that the built-up roofing membrane was brittle.

## EXHIBIT 'C'



19. An additional overall photograph of Roof Area D.



20. An additional overall photograph of Roof Area C. Leaks are reported below this roof area within the field of the roof. Tarps, hoses and buckets are utilized to catch the leaks.

## **EXHIBIT 'C'**



21. Overall photograph of the expansion joint from Roof Area D to Roof Area C. Cant strips were not provided during the original construction and continuous splits developed along the transition from the built-up roofing membrane to the base flashings of the expansion joint curb. Please note the extensive repair work, not only to the transition, but also the overlapping seams of the expansion joint curb flashings.



22. Photograph of a roof drain assembly on Roof Area D. Please note that within the sump area roof cement repairs were provided where the roofing membrane extends under the clamping ring at the roof drain assembly.

## EXHIBIT 'C'



23. Photograph of a typical skylight assembly on Roof Area C. Please note the base flashings at the curb for the skylight unit have been repaired with a bed of roof cement. The roof cement is starting to dry out. The transitions from the metal framing to the plastic domes of the skylights have been repaired with a continuous bead of sealant. This sealant is now starting to dry out. Also, all fasteners at the metal frame have had an application of caulked applied to make them watertight; however, this caulking material is now drying out.



24. The surface of the built-up roofing membrane in this area was repaired. The aggregate surface was brushed back and asphaltic waterproofing was provided. However, leaks continue to appear below this area of Roof Area D.

## EXHIBIT 'C'





25. Photograph of a ventilator curb on Roof Area D. The corners of the base flashings have been repaired with roof cement. The ventilator hood has developed cracks and therefore roof cement was required at the corners and along the top.



26. Photograph at a large HVAC curb. Over time, leaks have developed around the curb as base flashing failed. The aggregate surfacing was brushed back. Asphalt waterproofing and aluminum roof coating were applied around the entire perimeter of the curb.

## EXHIBIT 'C'



27. Overall photograph of the aggregate surfaced built-up roofing system over Roof Area D1. Roof Area D1 incorporates good slope, sloping in one direction to hanging gutters with downspouts.



28. An additional overall photograph of Roof Area D1. Roof Area D1 incorporates the same roof assembly as Roof Area A; however, the deck substrate is concrete and therefore the base layer of flat insulation was set in asphalt in lieu of mechanical fastening.

## EXHIBIT 'C'



29. The aggregate surfacing at this building corner was not embedded in asphalt. Wind blew the aggregate off the surface of the membrane and over time ultraviolet rays from the sun deteriorated and dried out the asphalt within the built-up roofing membrane. Over time, the membrane deteriorated. Roof cement repairs were required at this corner.



30. Overall photograph of Roof Area E. Roof Area E incorporates aggregate surfaced built-up roofing system. Roof slope is excellent, built into the building structure.

## EXHIBIT 'C'



31. An additional overall photograph of Roof Area A. During core sampling ARMM found the built-up roofing membrane to be brittle and layers of the fiberglass felt membrane could be pulled apart.

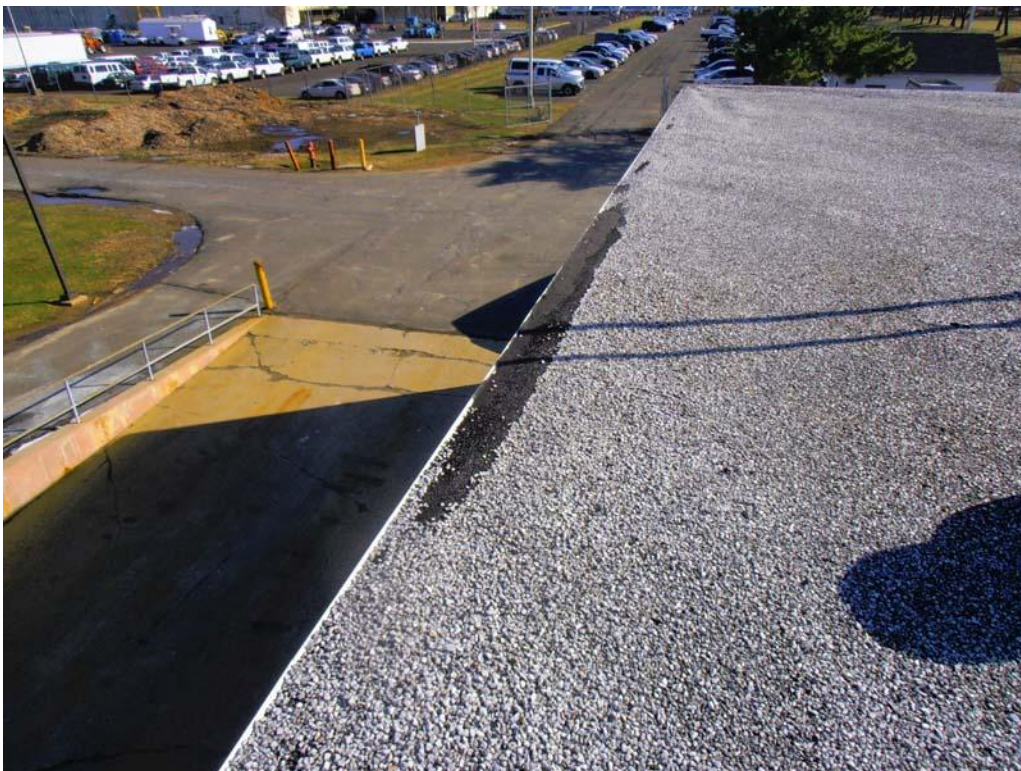


32. Overall photograph of the expansion joint curb separating Roof Area E from Roof Area D. Please note the overlapping seams of the base flashings at the expansion joint curb have been repaired with roof cement.

## EXHIBIT 'C'



33. Photograph of asphalt repairs where the built-up membrane extends under the drain clamping ring on Roof Area E.



34. Asphalt repairs were required along the flange of the gravel stop on Roof Area E in this area.

## EXHIBIT 'C'

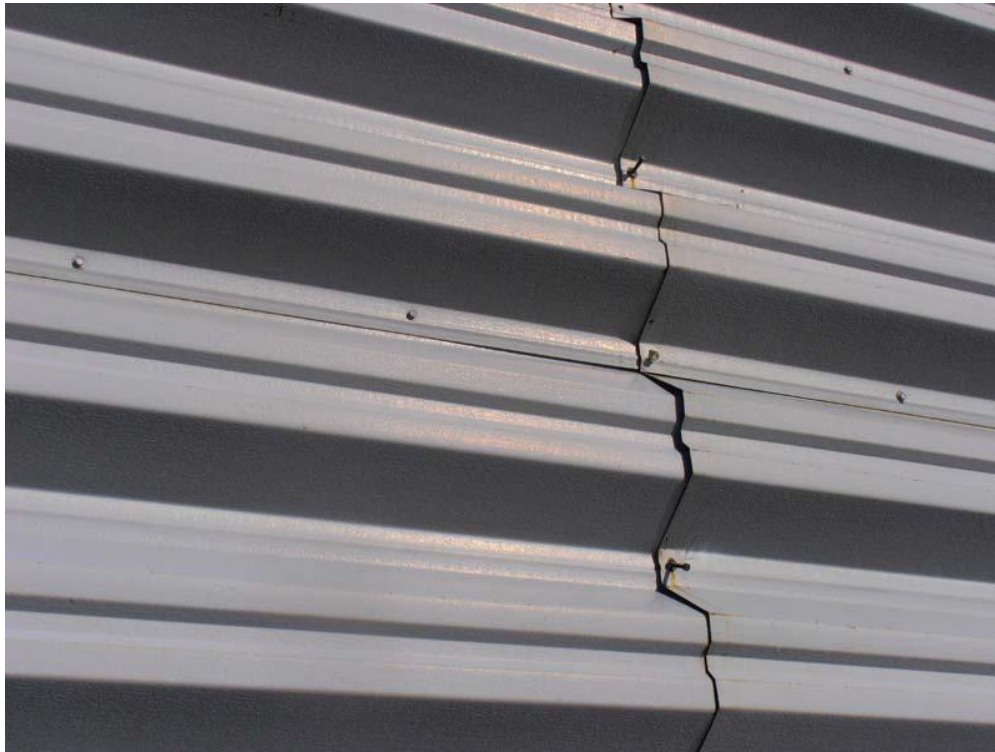


35. Typical photograph of the wall expansion joint at Roof Area E leading to the metal wall panel. Please note the overlapping seams of the base flashings at the expansion joint curb have been repaired with roof cement. The seams of the metal cap have also been repaired with strips of EPDM roofing material.



36. Overall photograph of the overlapping seams of the metal wall panels. Practically all of the overlapping seams of the metal wall panels are now open. Gaps vary from 1/16" to 1/2". Leaks are reported directly below the wall panels along interior corridor walls.

## EXHIBIT 'C'

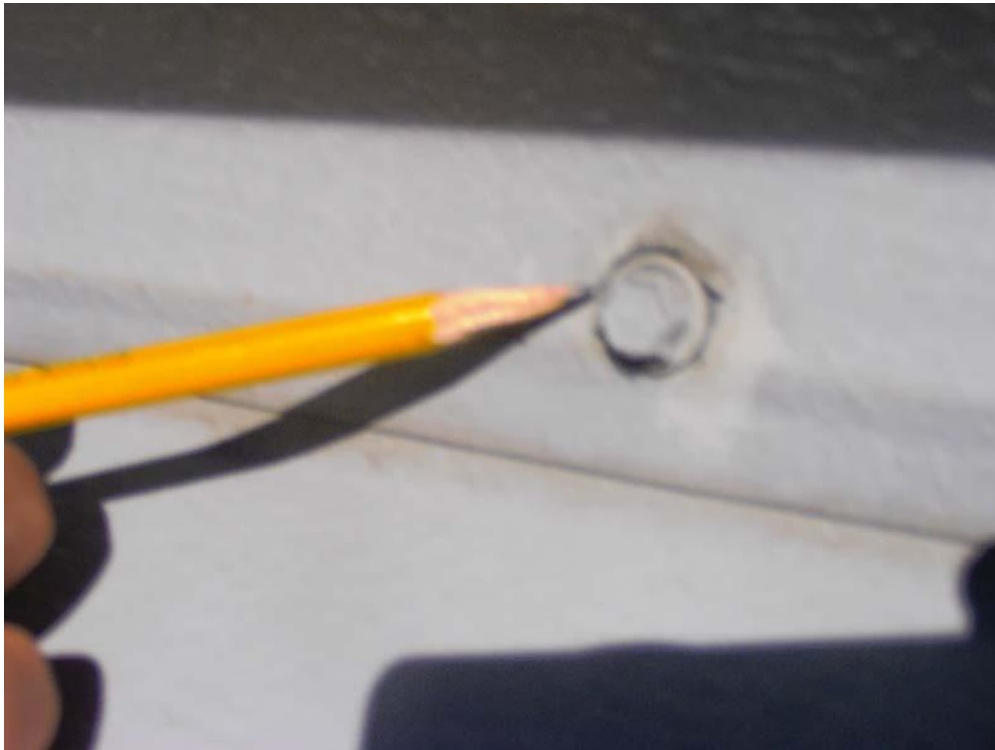


37. Photograph showing the mechanical fasteners utilized to secure the metal wall panels together at overlapping seams are backing out.



38. In this photograph, please note that the metal fasteners used to secure the metal panels at the overlapping seams have been caulked with roof cement. Also, a pencil was inserted within the gaps at the overlapping seams to show the extent of the openings.

## EXHIBIT 'C'



39. ARMM examined the metal fasteners used to secure the metal wall panels to the structure. ARMM found the rubber grommets used to make the fasteners watertight are drying out and deteriorated.



40. During ARMM's examination of the metal wall panels, ARMM was able to remove fasteners by hand at the overlapping seams of the metal wall panel.

## EXHIBIT 'C'





41. This photograph illustrates another location where the fasteners are backing out, as well as a continuous bead of caulk utilized to make the transition from the expansion joint cap to the metal wall panels watertight.



42. A typical overall photograph of the metal panels. The metal panel in this area is starting to rust at this overlapping seam location.

## EXHIBIT 'C'



43. Overall photograph of the aggregate surfaced built-up roofing system on Roof Area F. The roof incorporates excellent slope built into the structure.



44. An additional overall photograph of Roof Area F. Core sampling found the built-up roof membrane to be brittle and could easily be taken apart.

## **EXHIBIT 'C'**



45. Photograph of the large HVAC unit on Roof Area F. Please note the extensive roof cement repairs to the curb flashings at the corner in this photograph.



46. Over time, the roofing membrane at the perimeter dried out, splits developed, and a roof cement repair was required at this location. ARMM examined the perimeter strippings and found them to be dried out, deteriorating, and cracking.

## EXHIBIT 'C'



47. Overall photograph of the expansion joint leading from Roof Area F to Roof Area G. Please note the roof cement repairs to the overlapping seams.



48. Overall photograph of Roof Area G. Core sampling of this roof area found the roof membrane to be dried out. The roof incorporates good slope built into the structure.

## EXHIBIT 'C'



49. Photograph of one of the smoke hatches on Roof Area G. Please note the base flashing at corners and overlapping seams have been repaired with roof cement.



50. Photograph of roof cement repairs to the perimeter at Roof Area G. The stripping at the perimeter became brittle, drying out, and roof cement repairs were required in this area.

## EXHIBIT 'C'



51. Overall photograph of Roof Area H. This roof incorporates excellent slope built into the structure. However, as with the other roof areas, the roofing membrane has dried out over time.



52. An additional overall photograph of Roof Area H. This roof area incorporates similar deficiencies at equipment as other areas with overlapping seams and corners of equipment curbs repaired with roof cement.

## **EXHIBIT 'C'**



53. Overall photograph of Roof Area I. Core sampling found the built-up roofing membrane to be dried out and brittle, and could easily be taken apart.



54. An additional overall photograph on Roof Area I. As is the case with other roof areas, the roof incorporates excellent slope built into the structure.

## **EXHIBIT 'C'**



55. Photograph of the perimeter at Roof Area I. The stripping at the overlapping seams of the perimeter gravel stop split and roof cement repairs were required.



56. Photograph of a roof drain sump on Roof Area I. Please note blisters have developed at the transition from the flat insulation to the tapered insulation sump. General drying out of the roofing membrane is noted at the transition. The drain sump area around the roof drain has also been repaired.

## EXHIBIT 'C'





57. Photograph taken on Roof Area I showing some of the repairs to the perimeter with roof cement.



58. Photograph of the underside of the metal deck substrate on Roof Area F. Please note the mechanical fasteners used to mechanically fasten the base layer of insulation. Also please note the electrical conduit running along the underside of the metal deck substrate. The roofing contractor must be cognizant of the conduit running along the underside of the metal deck substrate during roof replacement.

## EXHIBIT 'C'



59. Damaged ceiling tiles from leakage below Roof Area D.



60. More damaged ceiling tiles below Roof Area D. Note the hose extending through the ceiling tile to drain moisture.

## EXHIBIT 'C'



61. Damaged ceiling tiles below Roof Area D.