



STATE OF NEW YORK
OFFICE OF GENERAL SERVICES
DESIGN AND CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242



ADDENDUM NO. 2 TO PROJECT NO. 44248

**CONSTRUCTION WORK
REPLACE ROOFING SYSTEMS
KEELER BUILDING NO. 77
GREATER BINGHAMTON HEALTH CENTER
425 ROBINSON STREET
BINGHAMTON, NY 13904**

June 7, 2012

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

C CONTRACT:

SPECIFICATIONS

1. 075216 – COLD APPLIED SBS MODIFIED BITUMEN ROOFING SYSTEM: Discard the Section in the Project Manual and substitute the accompanying Section (pages 075216-1 thru 075216-23) noted “Revised 06/05/12”.

DRAWINGS

NO ADDENDUM AT THIS TIME

END OF ADDENDUM

SECTION 075216

SBS MODIFIED BITUMEN ROOFING SYSTEM

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Restricted Work Period: Section 011000.
- B. Wood Nailers and Blocking: Section 061053.
- C. Flashing and Trim: Section 076000.
- D. Skylights: 086400.

1.02 REFERENCE

- A. ASTM: American Society of Testing and Materials.
- B. UL: Underwriters Laboratories, Inc.

1.03 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Company Field Advisor: An employee of the Company which lists and markets the primary components of the roofing system under their name who is certified in writing by the manufacturer to be technically qualified in design, installation, and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design, installation, and servicing of the required products. Personnel involved solely in sales and those acting as a contractor or sub-contractor to the roofs installation do not qualify.

1.04 ROOFING SYSTEM DESCRIPTION

- A. Modified Bitumen Roofing System: Granular surfaced SBS(Styrene Butadiene Styrene) modified bitumen membrane system consisting of a vapor retarder, layers of insulation, coverboard, two modified base plies set in cold adhesive, and a granular surfaced modified cap sheet set in cold adhesive.
 - 1. On metal decks and decks requiring a fire rating, provide underlayment board directly on the deck and below the vapor retarder as part of the modified bitumen roofing system.

1.05 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

1.06 SUBMITTALS

- A. Submit all items, except contract closeout submittals and MSDS, at one time as a complete package. Partial submittals will not be considered.
- B. Approvals: Approval of the roofing system is with the understanding that the requirements of the Contract Documents will be met. Approval of a roofing system does not constitute blanket approval of the manufacturer's installation specifications or details.
 - 1. If the requirements of the Contract Documents differ from or are more stringent than the requirements of the approved roof system manufacturer, the Contract Documents have precedence over the requirements of the approved manufacturer.
- C. Proposed Deviations From the Contract Documents: Submit for approval proposed deviations when the roofing system is submitted. Proposed deviations submitted after the roofing system has been approved will not be considered for approval and may be cause for rejection of the previously approved roofing system.
 - 1. Manufacturer's Details: Do not use or submit manufacturer's standard details unless there is an omission or a proposed deviation from the Contract Documents. In such instances, submit the revised detail for approval. Label each revised detail with the words "PROPOSED DEVIATION".
 - 2. Manufacturer's Specifications and Installation Instructions: When there is a proposed deviation from the Contract Documents, submit the proposed deviation for approval. Label each specification and instruction revision with the words "PROPOSED DEVIATION".
- D. Product Data: For each type of product specified including manufacturer's technical product data, installation instructions, and recommendations for each type of roofing product required. Include data substantiating that materials comply with specified requirements.
- E. Shop Drawings: Include plans (scale: 1/8 inch = 1 foot), sections (scale 1-1/2 inch = 1 foot), details (scale 3 inches = 1 foot), and attachments to other work, including:
 - 1. Base flashings and membrane terminations at (including but not limited too) walls, vent pipes, equipment curbs, hot stacks, scuttles, structure support beams, columns.
 - 2. Submit an accurate lay out of the tapered insulation showing the slopes at drains and the precise location of the existing drains. The layout shall be prepared or approved by the approved roof system manufacturer and the insulation manufacturer. Show cross section drawings illustrating the location and thickness of insulation pieces, filler pieces and base layer insulation.
- F. Samples of each product as follows:
 - 1. Coverboard: 12 by 12 inch square.
 - 2. Vapor Retarder: 12 by 12 inch square of each type.
 - 3. Modified Base Ply: 12 by 12 inch square.
 - 4. Modified Cap Sheet: 12 by 12 inch square.
 - 5. Modified Bitumen Flashing Membrane: 12 by 12 inch square.
 - 6. Metal Termination Bars: 12 inch length – one of each type.
 - 7. Insulation: Two 3 inch square piece.

8. Non-fibrated Aluminum Coating: One quart.
9. Underlayment Board: One 3inch square piece.

G. Quality Control Submittal

1. Fire Hazard Certification: Written certification that the roof system, including the specific insulation, has been tested in conjunction with the type of structural roof deck and roof slope applicable to the project and has achieved an Underwriters Laboratories Class A external fire resistance rating as determined by tests conducted in conformance with UL 790 or ASTM E 108.
 - a. Acceptable Certification: Letter from Underwriters Laboratories, or a copy of the Underwriters Laboratories classification listing for the roofing system.
2. Interior Fire Spread Certification: Written certification that the insulation when covered with the approved roof covering passes the tests of FM 4450 or UL 1256 when tested as an assembly.
3. Impact Resistance Certification: Submit written certification showing resistance to impact damage based on testing conducted in accordance with ASTM D 3746, ASTM D 4272 or FM 4470.
4. Accelerated Weathering Certification: Submit written certification showing physical integrity of the roofing based upon 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 154, or ASTM G 155.
5. Wind Uplift Certification: Submit written certification that the roof system, including the specific insulation, fasteners and adhesives, has been tested in conjunction with the type of structural roof deck applicable to this project will resist the wind loading noted on the Drawings to comply with the Building Code of New York State, and has achieved a Factor Mutual Wind Uplift rating when tested in conformance with FM 4450 or FM 4470 as follows:
 - a. Class 1-90,_____.
 - b. Acceptable Certification: Letter from Factory Mutual, or a copy of the Factory Mutual Approval Report for the roofing system.
6. Material Certification: Written certification from the roofing membrane manufacturer certifying that the insulation, insulation fasteners (if any), flashings and accessory products provided by the membrane manufacturer are approved for use with the roofing system and are included in the "25 Year Roof System Warranty" listed in Exhibit 'A'
 - a. Warranty: Sample copy of the roof system warranty listed in Exhibit 'A'.
7. Membrane Manufacturer's Certification:
 - a. Written certification that the manufacturer has been actively marketing the submitted system for the past 5 years.
 - b. Names and addresses of 5 previous EPDM roofing projects installed within the past 5 years. Include the type and size of each project, and name and telephone number of a contact person at the project locations.
8. Installer's Certification:
 - a. Written certification from the membrane manufacturer certifying that the installer is licensed or approved to install the roof system.

- b. Names, addresses, and telephone numbers of 3 buildings where the installer has installed EPDM sheet membrane roof systems that have had the manufacturer's warranty issued. Include the types of EPDM systems installed, the manufacturer's names, and the warranty numbers.
 - c. Written certification that the job supervisor or crew chief and at least one other member of the roofing crew have installed at least 3 EPDM sheet membrane roof systems and are thoroughly familiar with all aspects of the installation.
 - 9. Roofing Manufacturer's Company Field Advisor:
 - a. Name of individual acting as the Company Field Advisor.
 - b. Written certification from the roof system manufacturer that the individual acting as the technical representative has full understanding of the specified roof system, has at least 5 years of field experience in all phases of modified roofing and fully understands the requirements outlined in 1.10.
 - c. Names and addresses of 3 previous modified roofing projects installed within the past 5 years. Include the type and size of each project, and name and telephone number of a contact person at the project locations.
- H. Product Test Reports:
 - 1. For all modified bituminous sheet roofing include recent independent test data according to ASTM designation D-5147 "Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material" substantiating that materials comply with specified requirements.
 - 2. Evidence that the products and materials provided conform to all requirements specified herein, and are chemically and physically compatible with each other and are suitable for inclusion within the total roof system specified herein.
- H. Final Flow Test Report: Immediately prior to physical completion, flow test all roof drains and provide a report to the Directors Representative.
- I. Material Safety Data Sheets (MSDS): Do not include the MSDS in the Submittals Package. Submit the MSDS to the Director's Representative at the Pre-Application Roofing Conference.
- J. Contract Closeout Submittals:
 - 1. Warranty: Warranties as specified.

1.07 PERFORMANCE REQUIREMENTS

- A. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist the uplift pressures indicated on the drawing calculated according to ASCE 7.
- B. Factory Mutual Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FM 4450 and FM 4470 as part of a membrane roofing system and that are listed in Factory Mutual's "Approval Guide" for Class 1 or non combustible construction, as applicable. Identify materials with FM markings.

1.08 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. The manufacturer of the roofing system shall submit a list of at least 3 cold applied modified applications in similar nature to that specified within a

- reasonable proximity of the project site available for site visitation by the Director's Representative to inspect.
2. Submit evidence that the roofing system will provide the long-term performance required by the Project. This evidence shall be in the form of testing, other long-term roofs installed by the manufacturer that are in service for a similar duration to this Project that are within a reasonable proximity of the project site available for site visitation by the Director's Representative to inspect, independent research, or other appropriate information.
 3. Provide name and location of manufacturing plant where sheet goods and adhesives are manufactured.
- B. Installer Qualifications: Minimum five years experience under current contractor name who has specialized in installing roofing similar to that required for this Project to perform Work of this Section; who has standing approval, authorization or license by the roofing system manufacturer to install manufacturer's product; and who is eligible to receive the roof manufacturer's system warranty.
1. Workers: The supervisor or crew chief and at least one other member of the roofing crew shall have installed at least 5 cold process modified bitumen roof systems and shall be thoroughly familiar with all aspects of the installation.
 - a. Torch Safety (for Vapor Barrier work): Crew members handling torches shall be trained by an Authorized Certified Roofing Torch Applicator (CERTA) Trainer, be certified according to CERTA torch safety guidelines as published by the National Roofing Contractor's Association (NRCA), and follow torch safety practices as required by the contractor's insurance carrier. Designate one person on each crew to perform a daily fire watch, The designated crew member shall watch for fires or smoldering materials on all areas during roof construction activity, and for the minimum period required by CERTA guidelines after roofing material application has been suspended for the day.
 2. Installer's Field Supervision:
 - a. Site Supervisor/Foreman shall have a standing certification of training from the membrane manufacturer and minimum three supervisory jobs of comparable size and system specified.
 - b. Installer is required to maintain the same full-time Supervisor/Foreman on the job site during all phases of modified bituminous roofing work from project initiation through project completion, including insulation work; and at any time roofing work is in progress, proper supervision of personnel shall be maintained. A copy of the drawings and specification shall be in the possession of the Supervisor/Foremen and on the roof at all times.
- C. Fire-Test-Response-Characteristics: It is the intent of this specification to provide a roof system with an external fire rating. The descriptions specified herein are general descriptions. The insulation and other components shall be as required by the membrane manufacturer to provide the following:
1. Exterior Fire-Test Exposure: Class A; complying with ASTM E 108, for application and slopes indicated.
- D. Protection: It shall be the Contractor's responsibility to respond immediately to correction of roof leakage during construction. A four (4) hour time limit shall be given from the time of notification of emergency conditions. In the event of water penetration during rain or a storm, the Contractor shall provide for repair and protection of the building contents and interior. If the Contractor does not respond or cannot be contacted,

the Director's Representative will effect repairs or emergency action and the Contractor shall be back charged for all expenses and damages, if any.

- E. Pre-application Roofing Conference: Approximately two (2) weeks before scheduled commencement of modified bitumen roofing system and associated work, meet at Project site with Installer's Office Supervisor and Field Supervisor/Foreman, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in the around roofing that must precede or follow roofing work (including mechanical work if any), Director's Representative, roofing system manufacturer's representative, roof systems Company Field Advisor and other representatives directly concerned with performance of the Work, including (where applicable) Director's Representative insurers, test agencies, and governing authorities.

Pre-Meeting Objectives to have been completed:

1. Company Field Advisor shall have reviewed the contract documents, approved submittals and shop drawings.
2. Director's Representative shall have all approved submittals and samples.

Meeting objectives to include:

1. The Company Field Advisor shall provide a detailed tutorial on the required inspection/approval of substrates, required testing, and the installation of each roofing components.
2. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
3. Review roofing systems requirements (contract drawings, specifications, and other contract documents).
4. Review required submittals, both completed and yet to be completed.
5. Review and finalize construction schedule related to roofing work and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
6. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
7. Discuss the contracts Restricted Work Period regarding any necessary procedures, direction and prior approvals by the roofing manufacturer for roof systems installations.
8. Record discussion of conference, including decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
9. Review notification procedures for weather or non-working days.
10. Review proposed temporary protection.
11. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations, and other preparatory work performed by other trades.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
- B. Store and handle roofing sheets in a dry, well-ventilated, weather-tight location to ensure no possibility of significant moisture exposure and maintain within the temperature range

required by roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on pallets or other raised surface. Stand all roll materials on end. Cover roll goods with a canvas tarpaulin or other breathable material (not polyethylene).

1. Do not double-stack rolls.
 2. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.
- C. Do not leave unused rolled goods on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources, and secured from wind damage or blown-about.
- D. Do not stage/store open containers in proximity to intake ducts for the building.
- E. Deliver and store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- F. It is the responsibility of the contractor to secure all material and equipment on the job site. If any material is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the contractor will be sole responsibility of the contractor and will be repaired or replaced at his expense.

1.10 ROOF MANUFACTURER'S (COMPANY FIELD ADVISOR) DAILY INSPECTIONS

- A. The manufacturer of the roofing system, issuing the final system guarantee on this roofing project, must supply a "Company Field Advisor", as a technical representative, with full understanding of the specified system and at least 5 years of field experience in all phases of built up roofing.
- B. Secure the services of the Company Field Advisor for full time inspection during the roofing work to inspect the workmanship of the roofing system installer. The Company Field Advisor's inspections include removals through installations of all roofing components.
- C. Company Field Advisor Duties and Responsibilities:
1. Familiarize with the Contract Documents and approved submittals prior to the pre-application roofing conference.
 2. Attend the pre-application roofing conference for the purpose of:
 - a. Rendering technical assistance to the Contractor regarding installation procedure of the system.
 - b. Familiarizing the Director's Representative with all aspects of the system including inspection techniques.
 - c. All objective items outlined in pre-roofing conference section.
 - d. Answer questions that may arise.
 3. Attend each bi-weekly meeting during the roofing work.
 4. Be objective, unbiased and impartial in each inspection.
 5. Provide to the Director's Representative a written report, submitted prior to leaving the job site each day, that keeps the Architect informed as to the progress and quality of the work as observed.
 - a. The written reports shall contain at a minimum:
 - 1) Date
 - 2) Weather conditions
 - 3) Work performed

- 4) Inspect and approve the existing substrate, flashing, blocking, etc... as being acceptable for the installation of the roofing system.
- b. Immediately report unsatisfactory conditions to the Director's Representative for directive.
- c. Immediately notify the Contractor not to proceed with installation until unsatisfactory conditions are corrected.
- 6. Report to the Director's Representative in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
- 7. Confirm, after completion of the project and based on manufacturer's observations and tests, that the manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.11 PROJECT CONDITIONS

- A. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
- B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- C. Do not apply any roofing materials to damp substrate surfaces.
- D. Precipitation Limitations:
 - 1. Do not apply roofing membrane during inclement weather or when a 40% or higher chance of precipitation is expected, unless otherwise approved by the Director's Representative and or Company Field Advisor.
- E. Temperature Limitations:
 - 1. Cold Applied Membrane System: Application of temperature sensitive cold applied membrane adhesive is not recommended when the ambient temperature is below 40 degrees F.
 - a. The roofing manufacturer in written documentation shall sanction cold weather application below 40 degrees F. Provide a copy of the documentation to the Director's Representative.
 - b. Strict adherence to installation procedures is required.
 - c. When ambient temperature is 50 degrees F or lower, the contractor shall supply two (2) recording thermometers located as directed by the Director's Representative for monitoring application temperatures.
- F. Moisture Protection:
 - 1. Cover, seal or otherwise protect the roof and flashings so that water cannot accumulate or flow under completed portions. When and where necessary to accomplish this, provide temporary water cut-offs in accordance with the membrane manufacturer's written specifications.
 - 2. Limit the removal of existing materials to areas that can be completely re-roofed or temporarily protected within the same day. At the discretion of the Director's Representative, a watertight built-up vapor retarder may be acceptable temporary protection for a maximum of 48 hours or as outlined by the manufacturer.
- G. Take necessary precautions to ensure that odors from the roofing process do not enter the intake air system for the building.

1. Contact the Director's Representative minimum 72 hours in advance of roofing operations generating noxious odors and request intake fans to be shut down to prevent odors from being drawn into the building.
 2. Cover intake system with plastic and tape perimeter and lap joints.
- H. Do not smoke or use open flames near volatile materials.

1.12 SEQUENCING AND SCHEDULING

- A. Sequence installation of modified bituminous roofing with related units of work specified in other sections to ensure that roof assemblies, including roof accessories, flashing, trim, and joint sealers, are protected against damage from effects of weather, corrosion, and adjacent construction activity.
- B. Coordinate removals and reinstallations of exhaust fan units and other roof top mechanical equipment. Equipment shall be moved and/or lifted as required to install roofing. Equipment shall be carefully disconnected and moved/lifted so as not to cause damage to any part or component thereof, and shall be re-connected and restored to its prior operating condition, including modifications and extensions of curbs, electrical connections, ductwork, etc., as necessary.
- C. All area of work must be fully roof system complete by the end of each day.
 1. Phased construction will not be accepted.

1.13 MAINTENANCE

- A. Special Tools: Deliver to the Director's Representative.
 1. Tools for Vandal Resistant Fasteners for Roof Drains: One for each type and size.

1.14 WARRANTY

- A. Warranty Extension: The one year period required by Paragraph 9.8 of the General Conditions is extended to 2 years for the Work of this Section. Refer to Supplementary Conditions.
- B. Roofing System Warranty: In addition to the 2 year period specified above, furnish the Roofing System Warranty specified in Exhibit 'A' and Exhibit 'B' attached hereto."

PART 2 PRODUCTS

2.01 GENERAL

- A. When a performance standard is specified it shall be indicative of a standard required.
- B. Any system submitted as an alternate must comply in all respects as to the quality and performance, including job site investigation, of the specified system, as judged solely by the Architect.
 1. All substitutions must be submitted for review and approval by the Director's Representative within 14 days after receipt of Notice to Proceed.
 2. Should the contractor choose to submit on the equal basis without prior approval, he shall assume all risk involved, monetary or otherwise, should the Director's Representative find it unacceptable.

2.02 ROOF SYSTEM MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering SBS modified roof systems that may be incorporated into the Work include, but are not limited to, the following:
1. The Garland Company 3800 East 91st Street, Cleveland, OH 44105
1-(216) 641-7500 www.garlandco.com
 2. Tremco Incorporated 3735 Green Road, Beachwood, OH 44122
1-(216) 292-5000 www.tremcoroofing.com
 3. Viridian Systems 300 Southwest Ave, Tallmadge, OH 44278
1-(330) 634-0454 www.viridiansystems.net

2.03 VAPOR RETARDER

- A. Torch Down System (for concrete decks and over underlayment board on steel decks, gypsum, lightweight fill and tectum decking):

Cold Adhesive System (for wood decks)

1. Primer: V.O.C. compliant, ASTM D-41; as recommended by Membrane manufacturer.
2. Membrane: SBS-Modified Bituminous Sheet, Smooth Surfaced modified asphalt sheet with fiberglass or polyester reinforcement, smooth surfaced, dusted with fine parting sand on topside, thermofusible elastomeric asphalt on bottom side.
3. Properties:
 - a. SHEET THICKNESS:
 - 1) 80 mils minimum.
 - b. TENSILE STRENGTH:
 - 1) MD 90 lbf/in.
 - 2) CMD 80 lbf/in.
 - c. TEAR STRENGTH:
 - 1) MD 95 lbf.
 - 2) CMD 85 lbf.
 - d. ELONGATION:
 - 1) MD 5.0%
 - 2) CMD 5.0%
 - e. LOW TEMPERATURE FLEXIBILITY:
 - 1) passes -15 degrees F

2.04 SHEET MATERIALS

- A. Modified Base Plies: SBS (Styrene-Butadiene-Styrene) rubber modified reinforced roofing membrane.
1. Properties:
 - a. TENSILE STRENGTH (ASTM D-5147):
 - 1) 2 in/min. @ 73.4 + 3.6°F
 - 2) MD 135 lbf/in.
 - 3) CMD 135 lbf/in.
 - b. ELONGATION AT MAXIMUM TENSILE (ASTM D-5147)
 - 1) 2 in/min. @ 73.4 + 3.6°F
 - 2) 3.5 % minimum (both directions)
 - 3) 15.0% maximum (both directions)
 - c. TEAR STRENGTH (ASTM D-5147)

- 1) 2 in/min. @ 73.4 + 3.6°F
 - 2) MD 200 lbf/in.
 - 3) CMD 190 lbf/in.
 - d. LOW TEMPERATURE FLEXIBILITY (ASTM D-5147)
 - 1) passes -15 degrees F
- B. Modified Cap Sheet: 80 mil minimum, SBS (Styrene-Butadiene-Styrene) rubber modified reinforced roofing membrane.
 - 1. Properties:
 - a. TENSILE STRENGTH (ASTM D-5147)
 - 1) 2 in/min. @ 73.4 ± 3.6 °F
 - 2) MD 500 lbf/in.
 - 3) CMD 550 lbf/in.
 - b. ELONGATION AT MAXIMUM TENSILE (ASTM D-5147)
 - 1) 2 in/min. @ 73.4 ± 3.6°F
 - 2) 5.0% minimum (both directions)
 - 3) 15.0% maximum (both directions)
 - c. TEAR STRENGTH (ASTM D-5147)
 - 1) 2 in/min. @ 73.4 ± 3.6°F
 - 2) MD 750 lbf.
 - 3) CMD 750 lbf.
 - d. LOW TEMPERATURE FLEXIBILITY (ASTM D-5147)
 - 1) passes -15 degrees F
- C. Base Flashing Ply:
 - 1. Properties: Same as BASE ROOFING PLY
- D. Cap Flashing Ply:
 - 1. Properties: Same as MODIFIED CAP SHEET except with granular surface.
 - 2. Granular Surface Color: As selected from Manufacturer's standard colors.

2.05 COLD-APPLIED ADHESIVES

- A. Flashing, Base Plies, Cap Sheet, and Flood Coat Adhesive: One part, solvent free, cold applied adhesive specially formulated for compatibility and use with specified roofing membranes and flashings, with the following physical properties.
 - 1. Volatile Organic Compound (VOC): maximum, ASTM D6511: 300/L.
 - 2. Non-Volatile Content, minimum, ASTM D 6511: 95 percent.
 - 3. Density at 77 deg. F, minimum, ASTM D 6511: 8.5 lb/gal.
 - 4. Asbestos Content, EPS 600 R-93/116: None.
- B. Insulation Adhesive: Solvent-free, cold fluid-applied, bituminous-urethane adhesive formulated to adhere roof insulation to substrate, with the following physical properties:
 - 1. Asbestos Content, EPA 600/R13/116: None.
 - 2. Volatile Organic Compounds (VOC), maximum, ASTM D 3960: 50 g/L.
 - 3. Non-Volatile Content, minimum, ASTM D 1644: 98 percent.
 - 4. Density at 77 deg. F, minimum: ASTM D 1875: 8.5 lb/gal.
 - 5. Elongation at 77 deg. F, minimum, ASTM D 412: 1200 percent.
 - 6. T-Peel Strength at 77 deg. F, minimum, ASTM D 1876: 15 lbf.
 - 7. Adhesion Strength in Shear at 77 deg. F, minimum, ASTM D 816: 80 psi.
 - 8. Low-Temperature Flexibility, maximum, ASTM D 816: -60 deg. F.

2.06 INSULATION

- A. The total insulation thermal resistance averaged over the entire roof area shall produce an R-25.3.
- B. The indicated insulation thickness is nominal, allowing for differences in insulating properties of various name brands. Minor variation in thickness is acceptable, provided the specified thermal value and other requirements of this Contract are met.
- C. Approval of the insulation is contingent upon certification by the membrane manufacturer that the insulation is approved for use with the specified roof system and that the insulation is included in the 25 year full system warranty.
- D. Insulation System:
 - 1. Insulation: Membrane manufacturer's approved closed cell polyisocyanurate foam core skinned on both sides with factory applied fiberglass facers suitable for installation with cold adhesive. ASTM C1289-01 Type I, Class 1, Grade 2. UL Classified and factory mutual approved for application over a concrete deck.
 - a. Minimum LTTR Value: 6.0 per inch determined in accordance with PIMA Technical bulletin No. 101 and ASTM C 518.
 - b. Density: Nominal 2.0 pcf.
 - c. Compressive Strength: Minimum 18 psi, ASTM D 1621.
 - d. Dimensional Stability: Maximum 2 percent, ASTM D 2126.
 - e. Flame Spread: Maximum 25, ASTM E 84.
 - f. Maximum Board Dimension: 4'x4'.
 - 2. Coverboard: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch thick, factory primed.
 - a. Maximum Board Dimensions: 4' x 4' x 1/2".
 - 3. Tapered Crickets: Tapered insulation manufacturer's 1/2 inch per foot tapered polyisocyanurate crickets as required for positive drainage.
- E. Tapered Insulation System: Membrane manufacturer's approved factory tapered closed cell polyisocyanurate foam core skinned on both sides with factory applied fiberglass facers suitable for installation with cold adhesive. ASTM C1289-01, Type II, Class 1, Grade 2. UL Classified and factory mutual approved for direct application over a steel deck. Minimum LTTR: 6.0 per inch thickness.
 - a. 1/8 inch per foot.

2.07 UNDERLAYMENT BOARD

- A. Underlayment Board: Gypsum roof board composed of a silicone treated gypsum core with fiberglass facers.
 - 1. Acceptable Products:
 - a. Dens-Deck, 1/2 inch thick by Georgia-Pacific Corporation, Gypsum Division, 133 Peachtree Street, N.E., Atlanta, GA 30303, (800) 225-6119, www.gp.com
 - b. Securock Cement Board, 3/8 inch thick by USG, 550 West Adams Street, Chicago, IL 60661-3676, (312)-0436-4000, www.usg.com
 - 2. Adhesively Attached Barrier Board: Maximum board size 4 feet x 4 feet.
- B. Underlayment Board: Gypsum roof board composed of a silicone treated gypsum core with fiberglass facers.
 - 1. Acceptable Products:
 - a. Dens-Deck, 1/2 inch thick by Georgia-Pacific Corporation, Gypsum Division, 133 Peachtree Street, N.E., Atlanta, GA 30303, (800) 225-6119, www.gp.com

- b. Securock Cement Board, 3/8 inch thick by USG, 550 West Adams Street, Chicago, IL 60661-3676, (312)-0436-4000, www.usg.com
2. Mechanically Attached Underlayment: Minimum board size 4 feet x 8 feet.

2.08 AUXILIARY MATERIALS

- A. General: All materials asbestos-free, specially formulated for compatibility and use with modified bituminous roofing and flashing.
 1. Furnish liquid-type auxiliary materials that meet VOC limits of authorities having jurisdiction.
- B. Asphalt Primer: ASTM D-41.
- C. Asphalt Roofing Mastic: ASTM D-2822, Type I.
- D. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.
- E. Cold Applied Membrane Adhesive: VOC Compliant ASTM D-3960.
- F. Sealant: Terpolymer, one-part, complying with Federal Specification TT-S-00230.
- G. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; stainless steel nails shall be used with stainless steel. Nails and fasteners shall be flush-driven through flat metal disks of not less than 1-inch diameter, of sufficient length to provide 1 ½ inch minimum embedment, unless otherwise indicated.
 1. Masonry Anchors for Termination Bar to Masonry/Concrete: Diameter as recommended by manufacturer.
- H. Termination Bars: Extruded Aluminum (6063 alloy) with radius corners, and slotted holes at 8-inch OC maximum.
 1. Heavy Flat Aluminum Bar: 1/8-inch by 1-inch.
- I. Built Up Base Flashing Fasteners (use along top edge of base, beneath cap flashings):
 1. Concrete and/or Masonry Surfaces: Hardened masonry nails or zinc alloy hammer driven expansion anchors with stainless steel drive pins through 1 inch minimum sheet metal discs.
 2. Sheet Metal Surfaces: Hardened, self tapping, #10 sheet metal screws through 1 inch minimum sheet metal discs.
 3. Wood Surfaces: Galvanized roofing nails with minimum 3/8 inch diameter head.
- J. Cant Strips: Preformed fiberboard, ASTM C 208.
- K. Tapered Edge Strips: Factory tapered fiberboard, ASTM C 208.
- L. Materials for Pitch Pockets:
 1. Mortar: ASTM C 270, Type S.
 2. Elastomeric Cement: Non-sag, cold applied, trowel grade, single component rubber elastomer with minimum elongation of 400 percent, supplied by the membrane manufacturer to satisfy warranty requirements.
- M. PMMA (Polymethyl-Methacrylate) Flashing: Supplied by the membrane manufacturer to satisfy warranty requirements.

- N. Metal Compression Bar (use along top edge of base, beneath cap flashings for built-up base flashing):
 - 1. Compression Bar: 1-1/2 x 1/8 inch aluminum bar, maximum length 10 feet, with holes 1/16 inch larger than fastener diameter predrilled at 1 foot centers.
 - 2. Fasteners:
 - a. Concrete or Masonry: Hard aluminum alloy or stainless steel screws with 1/4 inch dia. Plastic expansion shield or 1/4 inch dia. Aluminum hammer driven expansion anchor. Length as required to securely hold the compression bar tight against the flashing surface.
 - b. Wood and Sheet Metal: Hard aluminum alloy or stainless steel screw. Length as required to securely hold the compression bar tight against the flashing surface.
- O. Compression Clamp - Stainless steel worm drive clamp.
- P. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer for intended use..

2.09 MISCELLANEOUS MATERIALS

- A. Existing Roof Drain Membrane Clamping Collar: Universal cast iron membrane clamping collar and mounting hardware.
 - 1. Acceptable Products:
 - a. Universal Membrane Clamping Collar Model No. 1002 by Jay R. Smith Mfg. Co., P.O. Box 3237, Montgomery, AL 36109, 334-277-8520, www.jrsmith.com
 - b. Universal clamping ring, By Marathon Roofing Products Inc. 367 Nagel Drive, Buffalo, NY, 14225-4732, (800) 828-8424, www.marathondrains.com
- B. Retro-Fit Roof Drains: Metal or plastic roof drains designed specifically for installation into an existing roof drain and conductor pipe. The drain shall be formed with an expandable drop tube or with an expandable rubber boot to form a watertight seal between the drop tube and the existing conductor pipe. The drain shall also have a large flashing flange, clamping ring and an aluminum strainer.
 - 1. Acceptable Products:
 - a. "Coppertight Roof Drain" by Marathon Roofing Products Inc. 367 Nagel Drive, Buffalo, NY, 14225-4732, (800) 828-8424, www.marathondrains.com
 - b. "RAC Insert Drain System" by OMG Inc., 153 Bowles Road, Agawam, MA, 01001 (800) 633-3800, www.olyfast.com
 - c. "Portals Plus Reroof Drain" by Portals Plus, Inc., 639 N. Thomas Drive, Bensenville, IL 60106 (800) PPI-5240, www.portalsplus.com
- C. Roof Drain Gravel Guard: Perforated 22 gage stainless steel ballast guard with 3/8 inch maximum diameter openings.

PART 3 EXECUTION

3.01 EXAMINATION AND INITIAL TESTING

- A. Testing Existing Conductor Heads and Downspouts: Before commencing with the Work of this Section, water test existing conductor heads, and downspouts down to grade. Repair existing conductors and downspouts above grade where needed as indicated in the

drawings. Provide a written report regarding below grade storm drainage of the existing building from grade at the building to the storm sewer and submit to the Director's Representative indicating which below grade pipes, if any, are not functioning properly. Below grade storm drainage repair work (if any) may, at the Director's option, be accomplished by an Order on Contract.

- B. Testing Pull Out Resistance of Fasteners: Before commencing with the roofing work, in the presence of the Director's Representative, conduct fastener pull out tests to determine if the pull out values meet the requirements of the Contract Documents and the membrane manufacturer.
 - 1. Conduct the tests at representative locations and/or where selected by the Director's Representative as follows:
 - a. Up to 5,000 square feet: 3 tests.
 - b. 5,000 to 10,000 square feet: 6 tests.
 - c. 10,000 to 50,000 square feet: 10 tests.
 - d. 50,000 to 100,000 square feet: 20 tests.
 - 2. Patch holes at the test locations.
 - 3. Do not proceed with the roofing work if the pull out resistance of the fasteners is less than 400 pounds.
- C. Examine substrates, areas, and conditions under which roofing will be applied for compliance with requirements.
- D. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.
- E. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thicknesses of insulation required.
- F. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION / PROTECTION

- A. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Protect floors, walls, windows and doors, ladders, and all finish surfaces to eliminate sources of soiling and trackable contaminants.
- C. Corrective action required as a result of building and/or grounds damage caused by work associated with this project shall be the sole responsibility of the Contractor.
- D. Ensure roof drain strainers are in place and secured during removal of insulation and other debris. Temporarily cover roof drains to prevent debris from entering drains. Uncover drains at the end of the work day. Provide cast iron strainers where existing strainers are missing.
- E. Construction Traffic: Progress the work so that there is no traffic over completed roofing membrane.
 - 1. Where traffic over completed roofing cannot be avoided, provide 1/2 inch minimum plywood traffic ways to protect the completed roofing membrane. Limit all traffic to the traffic ways.

3.03 GENERAL INSTALLATION REQUIREMENTS

- A. Start installation of all membrane roofing in presence of roofing system manufacturer's technical representative.
- B. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing modified bitumen roof system.
- C. Insurance/Code Compliance: Where required, install and test modified bitumen roofing system to comply with governing regulations and specified insurance requirements.
- D. Protect other work from spillage of roofing materials. Replace or restore other work damaged by installations of modified bituminous sheet roofing system work.
- E. Coordinate installing roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight. Remove cut offs immediately before resuming work.
- F. Substrate Joint Penetrations: Prevent bitumen from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction. Replace or restore damaged work.
 - 1. Provide "envelope wrap" detail as indicated on Contract Drawings. Extend the initial base roof ply beyond the perimeter cut-off, laying intermediate base plies and modified roof membrane, and wrapping the first base roof ply back over the system installation.
- G. Apply roofing materials as specified herein unless recommended otherwise by manufacturer's instructions.
 - 1. Keep roofing materials dry before and during application.
 - 2. Do not permit phased construction. Complete application of roofing plies, modified sheet and flashing in a continuous operation. Begin and apply only as much roofing in one day as can be completed that same day.
 - 3. "Mop and Flop" installation technique is not acceptable procedure.
- H. Shingling Plies: Install modified bituminous membrane roofing system with ply sheets shingled uniformly to achieve required number of membrane plies throughout. Shingle in direction to shed water.
- I. Cut-Offs: At end of each day's roofing installation, protect exposed edge of incomplete work, including ply sheets and insulation. Provide temporary covering with joints and edges sealed with roofing cement.
 - 1. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 2. The Contractor is responsible to maintain the roof in a water-tight condition at all times. Failure to do so shall burden the Contractor with the expense for all damages associated thereto.
 - 3. The building must remain water-tight at all times. The contractor is solely responsible for any/all interior damage caused by leaking associated with the work of this Contract.
 - 4. The Director's Representative reserves the right to select an independent testing agency to perform a thermographic scan of the roof to determine if any damp or wet materials have been installed. The Roofing Contractor shall employ and coordinate with the selected testing agency.

- a. If core cuts verify the presence of damp or wet materials, the Roofing Contractor shall be required to replace the damaged areas without expense to the Director's Representative.

3.04 VAPOR RETARDER: TORCH DOWN INSTALLATION

- A. Clean and prime the concrete sealed roof drain areas. Prime at rate recommended by vapor retarder membrane manufacturer, covering no more than 100 sq. ft. per gallon.
- B. Inspect condition of existing vapor retarder. If existing vapor retarder can be patched, proceed to install membrane where missing. Inform Directors Representative if existing membrane is missing or if it cannot be patched for any reason.
- C. Install a single ply of vapor retarder membrane starting at the low point of roofing layouts and shingled in proper direction to shed water on each area of roof, according. Lap sheet side and ends and as recommended by manufacturer's written instructions.
- D. Completely seal vapor barrier at terminations, obstructions, and penetrations.
- E. Installing Vapor Retarder and Vapor Retarder Underlayment Board on Steel Decks:
 1. Install one layer of vapor retarder underlayment board over the steel deck. Install the underlayment with the long edges running in the same direction as the flutes of the deck with edge joints bearing on the solid portions of the deck. Stagger end joints. Butt edges and ends snugly.
 2. Secure the underlayment to the deck.
 3. Set fasteners in the top flute only, with sufficient force to hold the underlayment firmly to the deck. Remove loose or defective fasteners.
 4. Install one base ply over the underlayment board with 3" minimum laps set in adhesive.
- F. Installing Vapor Retarder on Concrete Decks or Existing Vapor Retarders:
 1. Apply primer to the substrate before application of vapor retarder.
 2. Install one base ply over the concrete deck with 3" minimum laps set in adhesive.
- G. At curbs, walls, and wood blocking, fold the vapor retarder over the top of the insulation a minimum of 6 inches.
 1. Unless approved otherwise by the Director's Representative, follow immediately with the installation of the insulation and roofing membrane.

3.05 INSTALLING INSULATION

- A. Attachment of insulation boards with cold adhesive.
 1. On a prepared vapor retarder approved by the manufacturer, install insulation boards adhered to the vapor retarder in cold adhesive applied to the vapor retarder in accordance with the manufacturer's printed instructions.
 2. Mixing, dispensing, application of approved cold adhesive shall be according to manufacturer's specifications. When applying cold adhesive, place the insulation boards onto the adhesive within 3 minutes and walk on the boards immediately to spread the cold adhesive for maximum contact. Continue to walk on the insulation boards every 5-7 minutes until the insulation is firmly attached (usually 20-45 minutes).
 3. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of 1/4" away from the vertical surface. Stagger all joints a minimum of 6" – side-to-side/end-to end.

4. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.
- B. Attachment of gypsum coverboard with cold adhesive as approved by Roof System Manufacturer, applied to the insulation in accordance with the Manufacturer's printed instructions. Stagger all joints a minimum of 6" side-to-side/end-to end. Tape all joints of the coverboard insulation with approved joint tape as approved by Roof System Manufacturer.
- C. At roof drains, terminate the insulation with tapered edge strips forming a 48 inch square sump.
- D. Note - Unless otherwise approved by Director's Representative, follow immediately with the installation of the Roofing System.

3.06 MODIFIED BASE PLY INSTALLATION

- A. Base Plies: Install two (2) base sheets in cold applied membrane adhesive according to manufacturer's written instructions, shingled uniformly to achieve two plies throughout over the prepared substrate. The sheet must be cut in 18-foot maximum length and allowed to relax prior to being re-rolled and installed. Shingle in proper direction to shed water on each area of roofing.
- B. Lap ply sheet ends 8-inches. Stagger end laps 12-inches minimum. Adhesive should be slightly visible at all laps.
- C. Extend plies 2-inches beyond top edges of cants and tapered edge strips at wall and projection bases.
- D. Allow the two plies of base sheet to cure at least thirty minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

3.07 MODIFIED CAP SHEET APPLICATION

- A. The modified membrane shall be solidly bonded to the base ply layers with specified cold adhesive according to manufacturer's written instructions.
- B. Adhesive should be slightly visible at all laps. Care should be taken to eliminate air entrapment under the membrane.
- C. Subsequent rolls of modified membrane shall be installed across the roof as above with a minimum of 4-inch head laps and 8-inch end laps. The end laps shall be staggered 12-inches minimum. The modified membrane shall be laid in the same direction as the underlayers, but the laps shall not coincide with the laps of the base ply layers.
- D. Extend membrane 2-inches beyond top edge of all cants in full moppings of cold adhesive.

3.08 FLASHING MEMBRANE INSTALLATION (GENERAL)

- A. All curb, wall and parapet flashings shall be sealed with an application of mastic and mesh on a daily basis. No condition should exist that will permit moisture entering behind, around, or under the roof or flashing membrane.
- B. Prepare all walls, penetrations and expansion joints to be flashed and where shown on the drawings. Apply primer and allow drying tack free.
 - 1. Minimum flashing height is 8 inches above the surface of the field of the roof unless otherwise indicated.
- C. All plies will be adhered with mastic unless otherwise specified. Install base flashing ply to all perimeter and projections details. The top layer of flashing shall be mechanically fastened at all terminations.
- D. The entire sheet of flashing membrane must be solidly adhered to the substrate.
- E. Seal all vertical laps of flashing membrane with a three-course application of mastic and fiberglass mesh.
- F. Counter flashing, cap flashings, expansion joints, and similar work to be coordinated with roofing work are specified in other sections.
- G. Roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices to be coordinated with modified bituminous roofing system as per details approved by the roof system manufacturer.

3.09 CLEANING

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

3.10 TESTING

- A. After the new roof is completed, and just prior to the physical completion, the contractor shall flow test all roof drains and provide a report to the Owner to substantiate all roof drains are free flowing. The contractor shall be responsible for corrective action to any drains found plugged and having previously tested or certified as free flowing.

3.11 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Installer, installer of associated work, Owner, Architect, roofing system manufacturer's representative, and other representatives directly concerned with the performance of the roofing system.
 - 1. Request for Inspection shall be made by the contractor to all participants in writing and allowing no less than 7 business days for scheduling inspections.
- B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party attending.

- C. The roofing system manufacturer's technical personnel shall provide an independent report to the Director's Representative.
- D. The Director's Representative reserves the right to request a thermographic scan of the roof during final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the Roofing Contractor at a negotiated price.
 - 1. If core cuts verify the presence of damp or wet materials, the Roofing Contractor shall be required to replace the damaged areas without expense to the Director's Representative.
- E. Repair or replace (as required) deteriorated or defective work found at time above inspection to a condition free of damage and deterioration at time of substantial completion and according to warranty requirements.
- F. The Contractor is to notify the Director's Representative upon completion of corrections and readiness for final inspection.
 - 1. Request for Inspection shall be made by the contractor to all participants in writing and allowing no less than 7 business days for scheduling inspections.
- G. Following the final inspection, acceptance will be made in writing by the roofing system manufacturer.

EXHIBIT "A"
ROOFING SYSTEM WARRANTY

PROJECT: 44248-C – Replace Roofs, Keeler Building, Greater Binghamton Health Center.

SPECIFIC ROOFS: As indicated on attached Key Plan (Exhibit "B").

DATE INSTALLATION _____ DATE OF FINAL _____
COMPLETED: ACCEPTANCE:

ROOF APPROVED FOR ROOFING SYSTEM Name:
MANUFACTURED BY, Title:

ROOFING CONTRACTOR:

To: The Director's Representative and the State of New York, acting through the Office of Mental Health (OMH).

- A. The undersigned Roofing System Manufacturer (RSM) hereby agrees, for a period of twenty-five (25) years after final acceptance of the roof, to make immediate repairs as required to stop leaks or correct defects in the work of this contract. This is a full system warranty, covering all roofing components (including but not limited to separation board, vapor barrier, membranes, fasteners, insulation and flashing including metal). Said repairs shall commence within seventy-two (72) hours of the receipt of a notice from OMH by telephone, telegram, fax or letter. The Roofing System Manufacturer further agrees to make such repairs without reference to or consideration of the cause or nature of such leaks or defects. The Roofing System Manufacturer shall be responsible for all repairs.
- B. Twenty-Five (25) consecutive annual inspections, commencing one (1) year after acceptance of the work by the Director's Representative, shall be made by the RSM of the roofing system installed under this contract. The RSM shall submit a written report, within ten (10) days of the inspection, to OMH which shall include, but not be limited to, any indication of damage, deterioration, unusual wear, weathering effect, or no apparent defects at all. The RSM shall arrange and pay for the immediate repairs needed to stop any potential leaks or correct any defects discovered during the annual inspection.
- C. Repairs required within the stated period will be provided without cost to OMH: except that repairs required as a consequence to an Act of God, abuse, alteration, or failure of the substrata or supporting structure (other than caused by defects in the work of this Agreement) will be paid for by OMH upon completion of the repair in each instance subject to appropriation.
- D. Repairs that are the OMH's responsibility to pay shall be invoiced to OMH at the prevailing wage rates, and shall include an itemized breakdown of quantities plus unit cost for labor and materials, and shall include not more than twenty (20) percent markup for overhead and profit.
- E. The roofing system shall be warranted against failure due to wind speeds up to and including one hundred and ten (110) miles per hour.
- F. The Roof System Manufacturer is required to perform a roof moisture survey prior to issuing the warranty and at ten and twenty year intervals from acceptance of the work by the Director's

Representative. The surveys shall be completed by an experienced moisture survey company with experience represented by ten (10) comparable projects completed within the past two (2) years.

- 1.) Moisture survey equipment shall consist of the industry standard for surveys of similar content, at the time of the survey, but not less than the following:
 - i. Infrared camera operating in the spectrum range from 2 to 14 and capable of Minimum Resolvable Temperature Difference of 0.3 degrees C or less at 20 degrees C.
- 2.) The Roof System Manufacturer is required to submit to OMH a written report within ten (10) days of the survey, which shall include but not be limited to:
 - i. Scaled roof plan representing the areas surveyed showing survey results, identifying any anomalies found and proposed remedial action.
- 3.) The RSM shall provide to the Director's Representative one copy of the written report of the roof moisture survey performed prior to issuing the warranty. The copy shall be delivered at the same time the report is delivered to OMH.

G. This Warranty Agreement, and the enforcement of its provisions, shall not deprive the Director's Representative or OMH of any action, right, or remedy otherwise available to them.

ROOFING SYSTEM MANUFACTURER

OMH, ACTING BY AND THROUGH;

Name: _____

Name: _____

Address: _____

Title: _____

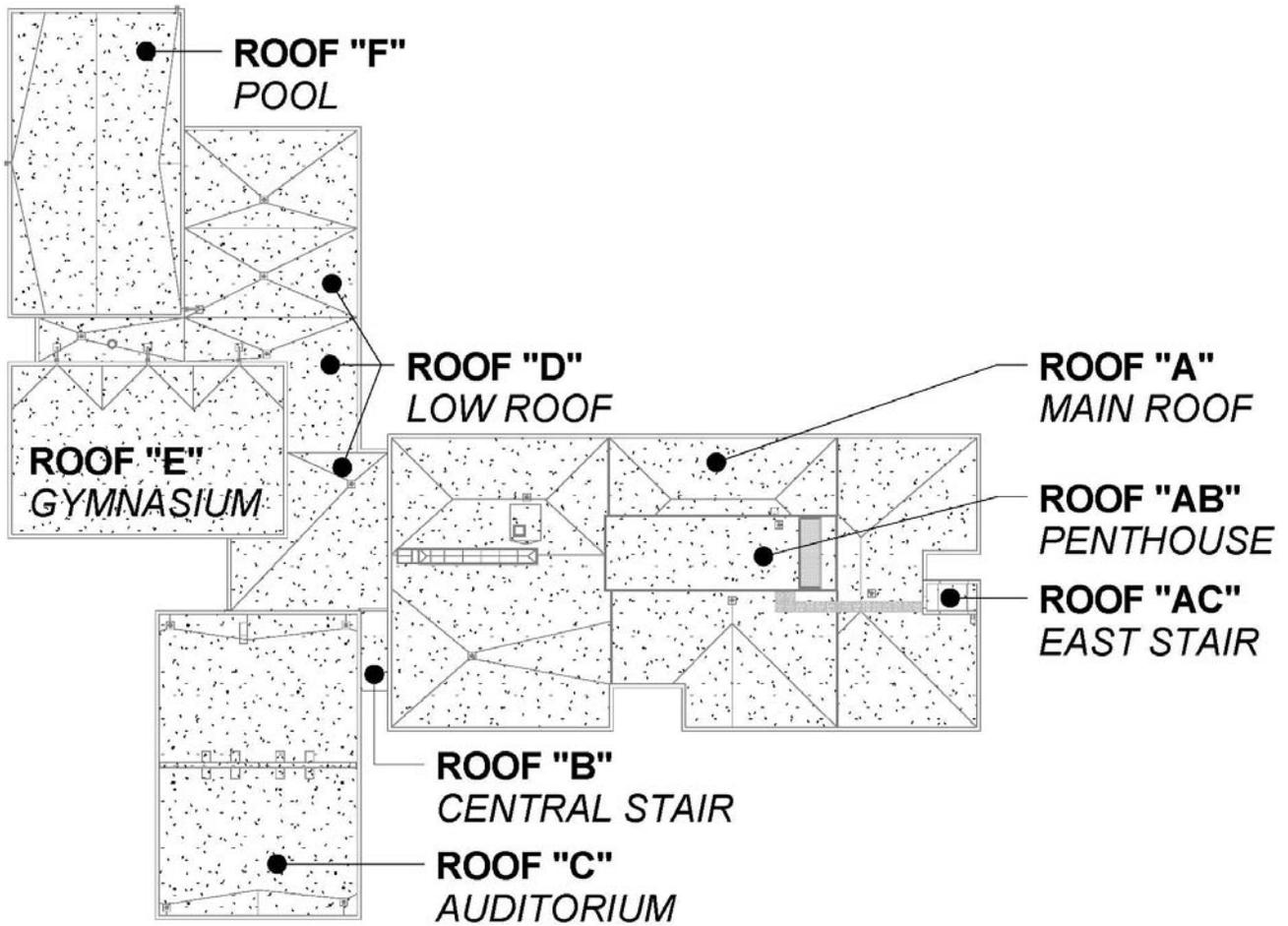
Authorized Signature: _____

Signature: _____

Title: _____ Date: _____

Date: _____

EXHIBIT "B"



ROOF KEY PLAN

END OF SECTION