

FOR INFORMATIONAL PURPOSES ONLY - NOT TO BE USED FOR BIDDING

FORM OF PROPOSAL

**ROOF RECONSTRUCTION REQUIREMENTS CONTRACT
VARIOUS LOCATIONS, NASSAU COUNTY, NY
GENERAL CONSTRUCTION
CONTRACT NO.: B90618R5**

Item No.	Approximate Quantity	Description with Unit Price in Words ⁽¹⁾				
1	150,000 Square Feet (sq. ft.)	Demolition For _____ Dollars Cents				
2	20,000 Square Feet (sq. ft.)	Plywood Sheathing Roofing System For _____ Dollars Cents				
3	20,000 Square Feet (sq. ft.)	Asphalt Shingle Roofing System For _____ Dollars Cents				
4	10,000 Square Feet (sq. ft.)	Wood Shake Roofing System For _____ Dollars Cents				

5	30,000 Square Feet (sq. ft.)	Built-Up Bituminous Roofing System For_____				
6	25,000 Square Feet (sq. ft.)	Single Ply Membrane Roofing System For_____				
7	5,000 Square Feet (sq. ft.)	EPDM Membrane Roofing System – High Wind For_____				
8	40,000 Square Feet (sq. ft.)	SBS Modified Bitumen Roofing System For_____				
9	5,000 Square Feet (sq. ft.)	SBS Mod. Bitumen Roofing Sys. – High Wind For_____				
10	10,000 Square Feet (sq. ft.)	Single Ply (TPO) Membrane Roofing System For_____				

11	5,000 Square Feet (sq. ft.)	TPO Membrane Roofing System – High Wind For _____				
12	3,000 Square Feet (sq. ft.)	Traffic Topping For _____				
13A	800 Pounds (lbs.)	Miscellaneous Metal - Aluminum For _____				
13B	700 Pounds (lbs.)	Miscellaneous Metal - Copper For _____				
13C	800 Pounds (lbs.)	Miscellaneous Metal – Lead Coated Copper For _____				
13D	100 Pounds (lbs.)	Miscellaneous Metal – Stainless Steel For _____				

14	Lump Sum	Force Account Work Two Hundred Fifty Thousand Dollars	\$250,000.	.00	\$250,000.	.00
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BASIS OF AWARD: Bids on Unit Price Contracts will be compared on the basis of the total bid price, arrived at by taking the Sum of the Approximate Quantities of such item multiplied by the corresponding Unit Price, and including any Lump Sum Bid on individual items, in accordance with the items set forth in the bid proposal. The sum of all “Amount’s Bid” will determine the low bid and the subsequent award of this Contract.

BID SECURITY: Prospective bidders are cautioned to carefully review the requirements of Paragraph H, Bid Security, of The Instructions to Bidders.

NOTES:

(1) See Section 01150 (Measurement and Payment) of the General Requirements and the applicable section of the Technical Specifications for a complete description of the work required as part of each Unit Price item.

**ROOF RECONSTRUCTION REQUIREMENTS CONTRACT
VARIOUS LOCATIONS, NASSAU COUNTY, NY
CONTRACT NO. B90618R5**

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SECTION 01010 SUMMARY OF WORK

PART 1 - GENERAL

1.01 General Requirements

- A. The work covered under this Contract involves furnishing the necessary labor, materials, tools, equipment and incidentals for the repair, removal, reconstruction and/or complete rehabilitation of various roofing systems and assemblies at various locations in Nassau County, New York.
- B. This Contract is intended to cover a number of individual locations dealing with the repair, removal, reconstruction and/or complete rehabilitation of various roofing systems. The County, from time to time, shall identify, by Work Order, individual work locations and the Contractor shall submit an estimated cost and schedule for each Work Order. The estimated costs shall be in accordance with the requirements described in Section 01150, Measurement and Payment, and the scope of each individual work order as issued by the Commissioner. When agreed to by the Commissioner or his duly authorized representative, the Contractor will be authorized to proceed.
- C. To assist you in the bid process, we have estimated that the expenditures for the nature of the work being bid herein is approximately \$3,000,000.00, not to exceed \$1,500,000.00 per year for two years. Be advised that this figure is provided for your guidance only and is not to be interpreted as an indication that any specific dollar amount of work is contemplated through the establishment of the Contract being bid at this time. **THE BID BOND SHALL BE IN THE AMOUNT OF \$300,000.00 AND THE PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND SHALL EACH BE IN THE AMOUNT OF \$3,000,000.00.**

1.02 Period Covered

- A. This Contract shall be for a term of 730 calendar days from the date set forth in the Contract start notice. The Contract may be extended for another two (2) years, and for \$1,500,000.00 per year, upon mutual agreement between the Contractor and the Department and upon written authorization from the Commissioner of Public Works. An extension to the contract may be allowed contingent upon the following:
 - 1. The same terms and conditions of the Contract will apply, Including all bid prices indicated in the contract proposal;
 - 2. The Contractor must have demonstrated that all Work Orders Issued to date under the contract have been completed and/or Progressed to the satisfaction of the Commissioner of Public Works.

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- B. The County reserves the right to cancel this Contract by giving not less than thirty (30) days written notice that, on or after a date therein specified, the Contract shall be deemed terminated and canceled.

1.03 Required Insurances

- A. Prior to the execution of this Contract, the Contractor, at his own expense, must furnish those insurance policies as indicated in Article 17 of the Agreement.
- B. The Contractor shall assume all responsibility for the insurance requirements of his subcontractors.

1.04 Work Orders

- A. No work shall be undertaken nor will any payment be made without a Work Order issued for the specific construction activities and signed by the Commissioner or his duly authorized representative.
- B. Upon issuance of a Work Order, the Contractor shall mobilize a qualified and appropriately certified work force of suitable size, properly equipped and with adequate materials and equipment and commence work immediately.

1.05 Qualifications of Bidders

- A. Bidders must:
 - 1. Have a minimum of five (5) years experience as a prime contractor in the repair, removal, reconstruction and/or rehabilitation of various roofing systems.
 - 2. Have averaged a minimum of \$500,000 per year of roofing construction activities over the past five (5) years.
 - 3. Have all applicable Federal, State and Local licenses and certifications to perform roofing construction activities. The Contractor must be in possession of all such licenses and certifications at the time of bid submission.
 - 4. Have all necessary roofing manufacturer certifications and be an authorized installer of the applicable roofing systems. Bidders are to provide copies of such certifications with their bid proposal. Failure to provide such certifications may result in the proposal being declared "non-responsive."

PART 2 – PRODUCTS

2.01 Communication

- A. In order to communicate with County Project Management and Inspection staff, the Contractor will provide Two (2) Cellular Telephones in either the latest versions of the Apple I-Phone or Samsung Galaxy or equal for the entire term of the contract. The following accessories shall be provided for each phone: battery chargers (wall and car), one (1) portable wireless battery charger and one (1) set of either Apple Air Pods or Samsung Earbuds. The cost of the Phones, related usage fees and insurance shall be included in the Contractor's overhead for each Work Order issued under the Contract.

2.02 Business Computing

- A. In order for County Project Management to have the ability to perform work from the field, maintain records and have remote access to Manufacturers and Suppliers Data, the Contractor will provide a portable laptop computer. The computer shall be provided with cellular connectivity to the internet and also software and graphics card updates. A fully functional, business version of Hewlett Packard or Microsoft product will be provided such as the HP 15.6" Laptop Intel Core i5 (Model No. 15-dy2093dx) for the entire term of the contract. The following accessories shall be provided for the computer: battery chargers (wall and car) and a carry case. The cost of the computer, service and support and related usage fees shall be included in the Contractor's overhead for each Work Order issued under the Contract.

PART 3 - EXECUTION

3.01 Contractors Operations

- A. The Contractor shall repair, remove, reconstruct and/or rehabilitate the various roofing systems as per the work order issued. During the course of these activities the Contractor will be responsible for related work as required.
- B. The Contractor shall protect the County's property from damage and loss arising in connection with this Contract and his work activities. He shall repair/replace any damage caused by his operation except that which is caused by agents or employees of the County. He shall provide all protection required by any public authority for the safety of the public and building occupants. He shall be responsible for all parts of his work until such work is accepted by the County.
- C. All work to be done in existing buildings or any other work which might affect the operation of the existing building(s) shall be done at the convenience of the County. The County shall be notified of this work in sufficient time so that the proper arrangements may be made.

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- D. The Contractor shall maintain unobstructed entrance and exit to and from areas of building operations.
- E. The Contractor shall supply all labor, materials, services, insurance, permits and equipment necessary to carry out the work in accordance with all applicable federal, state and local laws, codes and regulations.
- F. Prior to the issuance of a Work Order, the Contractor must visit the site and shall become familiar with any General Requirements at the site which must be considered during his work. These conditions include but are not limited to:
 - 1. Limited truck access to the work area(s).
 - 2. Sole entrance/exit paths to each work area.
 - 3. Building or structure being occupied and in use by Nassau County personnel or the general public.
- G. The Contractor is responsible for restoring the work area and auxiliary areas utilized during his activities to conditions equal to or better than original. Any damage to existing equipment, building structures or contents, due to the failure of the Contractor to provide proper protection, shall be repaired and/or replaced at the Contractors expense.
- H. Equipment and other items that will need to be moved or temporarily relocated by the Contractor for the work to proceed, will be moved back (and, if applicable, re-installed) by the Contractor to its original location unless otherwise instructed by the Commissioner.
- I. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflicts among the requirements or with these specifications exists, the most stringent requirements shall apply.
- J. The Contractor shall, after completion of the work and prior to receiving final payment for the work, submit a no dollar limit twenty (20) year Roofing Manufacturer's Warranty on Built-up and Membrane Roofing Systems and a (30) year manufacturers warranty for Asphalt Shingle Roofing Systems.

[END OF SECTION]

SECTION 01050
COORDINATION

PART 1 - GENERAL

1.01 Coordination with County Agencies and Other Contractors

- A. During the progress of the Work on this Contract, other contractors may be engaged in performing Work within the Contract area and in areas adjacent to this Contract area.
1. The Contractor's attention is specifically directed to the fact that because of the work on other contracts within and adjacent to the limits of this Contract he may not have exclusive occupancy of the territory within or adjacent to the limits of this Contract.
 2. The Contractor will be required to cooperate with other Contractors and the Owners of the various utilities and to coordinate and arrange the sequence of his Work in such a manner that all work, proposed or in progress within or adjacent to the limits of the Contract, can be progressed with as little interference as possible.
 3. In case of interference between the operations of a Contractor and/or utility owners and/or other Contractors, the Commissioner shall be the sole judge of the rights of each party and of the sequence for Work necessary to expedite the completion of all the work progressed or about to be progressed within or adjacent to the Contract limits.
- B. The direction of the Commissioner on the order and sequence of the Work shall not in itself constitute a basis for extra compensation or time.

[END OF SECTION]

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SECTION 01070 CUTTING AND PATCHING

PART 1 - GENERAL

1.01 General Requirements

- A. This Section includes all cutting and patching of all Work under construction, completed Work and facilities installed by others, in order to accommodate the coordination of Work, install other Work, uncover Work for access, inspection or testing, or similar purposes. Execute all cutting and patching required to:
 - 1. Remove and replace defective Work or Work not conforming to requirements of the Contract Documents.
 - 2. Remove samples of installed Work as required for testing.
 - 3. Remove all constructions required to provide for specified alteration or addition to Work by others.
 - 4. Uncover Work to provide for the County's inspection of covered Work or inspection by regulatory agencies having jurisdiction.
 - 5. Connect to completed Work that was not accomplished in the proper sequence.
 - 6. Remove or relocate utilities and pipes installed by others which obstruct the Work to which connections must be made.
 - 7. Make connections or alterations to new facilities or facilities installed by others.
- B. Restore all Work by others to a state equal to that which it was in prior to cutting and restore new Work to the standards of these Specifications.
- C. Submittals:
 - 1. Prior to any cutting which may affect integrity and design function of Project, County's operations, or Work of another Contractor, submit written notice to the County, requesting consent to proceed with cutting, including:
 - a. Identification of Project.
 - b. Description of affected Work of Contractor and Work of others.

- c. Necessity for cutting.
 - d. Effect on other Work and on structural integrity of Project.
 - e. Description of proposed Work. Designate:
 - 1) Scope of cutting and patching.
 - 2) Contractor, Subcontractor or trade to execute Work.
 - 3) Products proposed to be used.
 - 4) Extent of refinishing.
 - 5) Schedule of operations.
 - f. Alternatives to cutting and patching, if any.
 - g. Designation of party responsible for cost of cutting and patching.
2. Should conditions of Work, or schedule, indicate change of materials or methods, submit written recommendation to the County, including:
- a. Conditions indicating change.
 - b. Recommendations for alternative materials or methods.
 - c. Submittals as required for substitutions.
3. Submit written notice to the County, designating time Work will be uncovered, to provide for observation. Do not begin cutting or patching operations until authorized by the County.
- D. Provide shoring, bracing and support as required to maintain structural integrity of Project and protect adjacent Work from damage during cutting and patching.
- E. Conform to all applicable Specifications for application and installation of materials used for patching.

[END OF SECTION]

SECTION 01091
REFERENCE STANDARDS

PART 1 - GENERAL

1.01 General Requirements

- A. All materials and workmanship shall comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations.
- B. In case of difference between applicable building codes, specifications, state laws, local ordinances, industry standards and utility company regulations and the Contract Documents, the most stringent shall govern. The Contractor shall promptly notify the Architect, in writing, of any such difference.
- C. Should the Contractor perform any work that does not comply with the requirements of the applicable building codes, state and federal laws, local ordinances, industry standards and utility company regulations, he shall bear all cost arising in correcting the deficiencies.
- D. The Contractor shall comply with the Federal Occupational Safety and Health Act.
- E. Applicable Codes and Standards shall include all state laws, local ordinances, utility company regulations, and applicable technical requirements of the following accepted codes and standards (latest editions):
 - 1. Building Codes
 - a. New York State Fire Prevention and Building Code
 - b. New York State Sanitary Code
 - c. National Electric Code
 - d. New York State Energy Conservation Construction Code
 - 2. Industry Standards, Codes and Specifications
 - ADA Americans With Disabilities Act
 - AMCA Air Moving and Conditioning Association, Inc.
 - AASHTO American Association of State Highway and Transportation Officials
 - ABMA American Boiler Manufacturers' Association
 - ACI American Concrete Institute
 - ACIFS American Cast Iron Flange Standards
 - AFBMA Anti-Friction Bearing Manufacturers Association.

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AGA	American Gas Association.
AGMA	America Gear Manufacturers Association.
AIA	American Institute of Architects.
AISC	American Institute of Steel Construction.
AISI	American Iron and Steel Institute.
AMCA	Air Moving and Conditioning Association.
ANSI	American National Standards Institute.
APA	American Plywood Association.
API	American Petroleum Institute.
ASCE	American Society of Civil Engineers.
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers.
ASME	American Society of Mechanical Engineers.
ASTM	American Society for Testing and Materials.
AWPA	American Wood Preservers Association.
AWS	American Welding Society.
AWWA	American Water Works Association.
CGA	Compressed Gas Association.
CRSI	Concrete Reinforcing Steel Institute.
CMAA	Crane Manufacturers' Association of America.
DIPRA	Ductile Iron Pipe Research Association.
EEI	Edison Electric Institute.
EJMA	Expansion Joint Manufacturers' Association.
Fed Spec	Federal Specifications.
FM	Factory Mutual.
HMI	Hoist Manufacturers' Institute.
IEEE	Institute of Electrical and Electronic Engineers.
IPCEA	Insulated Power Cable Engineers Association.
	Nassau County Fire Prevention Ordinance, Article III.
NACE	National Association of Corrosion Engineers.
NB	National Board of Boiler Pressure Vessels.
NBS	National Bureau of Standards.
NCDPW	Nassau County Department of Public Works Standard Specifications for Construction of Highways and Bridges and Nassau County Department of Public Works Standard Specifications for Construction of Sanitary Sewers.
NEC	National Electric Code.
NEMA	National Electrical Manufacturers Association.
NFPA	National Fire Protection Association.
NYSDOT	New York State Department of Transportation.
OSHA	Occupational Safety and Health Act.
PCA	Portland Cement Association.
PCI	Prestressed Concrete Institute.

SMACCNA	Sheet Metal and Air Conditioning Contractors National Association.
SPI	Society of the Plastics Industry.
SSPC	Steel Structures Painting Council.
STI	Steel Tank Institute
UL	Underwriters' Laboratory.

- F. Where reference is made to applicable codes, specifications, local ordinances, utility company regulations, and other standards, the latest issue of these documents is intended, as of the date of issuance of the Contract Documents for bid.
- G. Contractor shall, when required, furnish evidence satisfactory to the Engineer that materials and methods are in accordance with such standards where so specified.
- H. In the event any questions arise as to the application of these standards or codes, copies shall be supplied on Site by Contractor.

[END OF SECTION]

SECTION 01094
DEFINITIONS

PART 1 - GENERAL

1.01 General Requirements

- A. In addition to the terms defined in the Agreement and General Conditions, the following shall apply:
1. Wherever the term "Architect", "Design Consultant", or "Engineer", or pronoun used in place thereof appear, [They are to mean the "County Representative" acting for the Commissioner].
 2. Wherever the term "Contractor" is used it shall mean the "General Contractor."
 3. Wherever the terms "provide", "supply", "furnish", "install", "set in place" appear, they are to mean to provide for materials and labor and comprise everything necessary to the proper and complete finishing of the Work in every part notwithstanding that each and every item necessary may not be shown on the drawings or mentioned in the specification.
 4. Wherever the term "Standard Specifications" appears, it shall mean "County of Nassau Department of Public Works Standard Specifications for the Construction of Highways and Bridges" and "for Construction of Sanitary Sewers" as amended to date, and as modified by the Contract Documents.
 5. Wherever the term "Scope" is used in any Section of Work, its intent shall be to clarify the meaning of the Section insofar as the range of Work of the Section is concerned. Items of related work not specifically listed under "Scope" but either shown in the drawings or further described in the body of the Specifications shall be assumed to be included in Scope of Work for the Section.
 6. In Article 1 of the Agreement, Item j, "The Specifications", shall mean the "General Conditions, General Requirements, and the Technical Specifications."
 7. "Working Day" shall mean a weekday (Monday to Friday, inclusive) during which one or more of the building trades are working and not on a holiday for the trades working.

[END OF SECTION]
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SECTION 01150
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 Description

- A. The items listed below beginning with Paragraph 1.06, refer to and are the same pay items listed in the Bid Schedule. They constitute all of the pay items for the completion of the Work.
- B. Unit bid prices shall include all costs necessary to perform the work described within the applicable work item including, but not limited to: labor; materials; equipment; disposal; insurance; filing fees; overhead; and, profit.

1.02 Estimate of Quantities

- A. The estimated quantities for unit bid prices, as listed in the Proposal, are approximate only and are included solely for the purpose of comparison of Bids. The County does not expressly or by implication agree that the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as County may deem necessary. Contractor will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate measurement, or by any changes or alterations in the Work approved by the Engineer, and for use in the computation of the value of the Work performed for Partial Payments.
- B. The Contractor shall be responsible for and include in its unit bid prices any and all fees or charges imposed by Federal, State and local laws, rules and regulations applicable to the work specified herein.

1.03 Related Provisions Specified Elsewhere

- A. Payments to Contractor: Refer to Agreement and General Conditions.

1.04 Work Orders

- A. For each Work Order, the Contractor shall submit a written scope of work outlining in detail, the appropriate items and the estimated quantities of each. The proposal shall include the total cost, which is subject to revision depending on actual quantities entailed in the project. The Contractor will be paid on the basis described below. All payment vouchers shall be supported by adequate documentation that verifies that the costs were incurred by the Contractor.

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1.05 Schedules

- A. The Contractor must submit to the County Representative a Schedule for Working Hours. All work shall be done during a normal eight (8) hour shift, seven (7) days per week (regardless of whether the work is done at night, on weekends or during the day). If the Contractor chooses to work beyond the normal work hours specified, and the County grants permission to work those hours, the Contractor will be responsible for reimbursing the County for the additional cost, including benefits costs, of any County authorized inspector that work these overtime hours.

1.06 Payment Items and Basis of Payment

A. Item No. 1 - Demolition

1. Description - Under this item, the Contractor shall remove and dispose of all existing roofing system elements, including, but not limited to: vapor barrier/felts; insulation; membrane/plys; flashing; gravel; ballast etc., in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per square foot of roofing system (single roofing system including vapor barrier/felts, insulation, membrane/plys, flashing, gravel, ballast etc.) removed.

NOTE: If multiple roofing systems are encountered, the measurement of the quantity of the additional roofing system layers will be as described above and payment for the additional layers will be at fifty (50) percent of the unit price bid.

3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 02112 (Selective Demolition) and as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

B. Item No. 2 – Plywood Sheathing

1. Description - Under this item, the Contractor shall furnish and install a new complete 19/32” CDX plywood sheathing roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.

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2. Method of Measurement - The unit price bid for this item shall be per square foot of plywood sheathing installed.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 06100 (Rough Carpentry) and as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

C. Item No. 3 - Asphalt Shingle Roofing System

1. Description - Under this item, the Contractor shall furnish and place a new complete architectural asphalt shingle roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per square foot of asphalt shingle roofing placed in the finished work.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07311 (Asphalt Shingle Roofing); Section 07190 (Vapor Barriers); Section 06100 (Rough Carpentry); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

D. Item No. 4 – Wood Shake Roofing System

1. Description - Under this item, the Contractor shall furnish and place a new complete Number 1 Blue Label Cedar Shingle roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per square foot of cedar shake roofing placed in the finished work.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07312 (Wood Shingle and Shake Roofing); Section 07190 (Vapor Barriers); Section 06100 (Rough Carpentry); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

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E. Item No. 5 - Built-Up Bituminous Roofing System

1. Description - Under this item, the Contractor shall furnish and place a new complete built-up bituminous roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per square foot of built-up bituminous roofing placed in the finished work.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07510 (Built-Up Bituminous Roofing); Section 07190 (Vapor Barriers); Section 07240 (Roof and Deck Insulation); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

F. Item No. 6 - Single Ply Membrane Roofing System

1. Description - Under this item, the Contractor shall furnish and place a new complete single-ply membrane roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per square foot of single-ply membrane roofing placed in the finished work.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07530 (Single Ply Membrane Roofing); Section 07190 (Vapor Barriers); Section 07240 (Roof and Deck Insulation); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

G. Item No. 7 - Single Ply Membrane Roofing System – High Wind Application

1. Description - Under this item, the Contractor shall furnish and place a new complete single-ply membrane roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.

2. Method of Measurement - The unit price bid for this item shall be per square foot of single-ply membrane roofing placed in the finished work.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 075323 (Single Ply Membrane Roofing – High Wind Application); Section 07190 (Vapor Barriers); Section 07240 (Roof and Deck Insulation); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

H. Item No. 8 – SBS Modified Bitumen Roofing System

1. Description - Under this item, the Contractor shall furnish and place a new complete watertight sheet membrane roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per square foot of sheet membrane roofing placed in the finished work.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07520 (SBS Modified Roofing); Section 07190 (Vapor Barriers); Section 07240 (Roof and Deck Insulation); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

I. Item No. 9 – SBS Modified Bitumen Roofing System – High Wind Application

1. Description - Under this item, the Contractor shall furnish and place a new complete watertight sheet membrane roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per square foot of sheet membrane roofing placed in the finished work.

3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 75216 (SBS Modified Bitumen Roofing – High Wind Application); Section 07190 (Vapor Barriers); Section 07240 (Roof and Deck Insulation); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

J. Item No. 10 - Single Ply (TPO) Membrane Roofing System

1. Description - Under this item, the Contractor shall furnish and place a new complete single-ply membrane roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per square foot of single-ply membrane roofing placed in the finished work.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 75423 (Single Ply (TPO) Membrane Roofing); Section 07190 (Vapor Barriers); Section 07240 (Roof and Deck Insulation); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

K. Item No. 11 - Single Ply (TPO) Membrane Roofing System – High Wind Application

1. Description - Under this item, the Contractor shall furnish and place a new complete single-ply membrane roofing system and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
3. Method of Measurement - The unit price bid for this item shall be per square foot of single-ply membrane roofing placed in the finished work.

3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 75423A (Single Ply TPO Membrane Roofing – High Wind Application); Section 07190 (Vapor Barriers); Section 07240 (Roof and Deck Insulation); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

L. Item No. 12 - Traffic Topping

1. Description - Under this item, the Contractor shall furnish and place traffic topping (i.e. walkway pads) and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.01150-4
2. Method of Measurement - The unit price bid for this item shall be per square foot of traffic topping placed in the finished work.
3. Basis of Payment - The unit price bid per square foot for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07570 (Traffic Topping); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

M. Item No. 13A - Miscellaneous Metal - Aluminum

1. Description - Under this item, the Contractor shall furnish and place miscellaneous aluminum items and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per pound of aluminum placed in the finished work.
3. Basis of Payment - The unit price bid per pound for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07620 (Metal Flashing and Trim); Section 07631 (Gutters and Downspouts); Section 07710 (Manufactured Roof Specialties); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

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N. Item No. 13B - Miscellaneous Metal - Copper

1. Description - Under this item, the Contractor shall furnish and place miscellaneous copper items and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per pound of copper placed in the finished work.
3. Basis of Payment - The unit price bid per pound for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07620 (Metal Flashing and Trim); Section 07631 (Gutters and Downspouts); Section 07710 (Manufactured Roof Specialties); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

O. Item No. 13C - Miscellaneous Metal – Lead Coated Copper

1. Description - Under this item, the Contractor shall furnish and place miscellaneous lead coated copper items and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per pound of lead coated copper placed in the finished work.
3. Basis of Payment - The unit price bid per pound for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07620 (Metal Flashing and Trim); Section 07631 (Gutters and Downspouts); Section 07710 (Manufactured Roof Specialties); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

P. Item No. 13D - Miscellaneous Metal - Stainless Steel

1. Description - Under this item, the Contractor shall furnish and place miscellaneous stainless steel items and associated appurtenances in accordance with the plans, specifications and as ordered by the County Representative.
2. Method of Measurement - The unit price bid for this item shall be per pound of stainless steel placed in the finished work.

3. Basis of Payment - The unit price bid per pound for this item shall include the cost of furnishing all labor, materials and equipment to complete the work in accordance with Section 07620 (Metal Flashing and Trim); Section 07631 (Gutters and Downspouts); Section 07710 (Manufactured Roof Specialties); Section 07951 (Sealants and Caulking); and, as might be further described in the applicable sections of the General Conditions, General Requirements and the Technical Specifications.

Q. Item No. 14 - Force Account Work

1. Description - If there are no applicable unit prices for a particular type of work to be performed and/or materials to be supplied under this contract, the Contractor shall proceed on a Force Account basis.
3. Method of Measurement - If no such applicable unit prices are set forth for the work and/or materials, the cost will be determined by the actual and reasonable cost to the Contractor of necessary materials and the wages of applied labor plus an overhead and profit percentage.
3. Basis of Payment - Force Account work is to be compensated in the following manner:
 - a. Labor
 - i. The Contractor shall pay wages as in effect per New York State Department of Labor schedule of prevailing wage rates and supplemental benefits as indicated in this Contract.
 - ii. Total labor costs shall include Workmen's Compensation Insurance, public liability and property damage insurance, unemployment insurance, required Federal benefits and other payroll taxes and payments required to be made to labor organizations under existing labor agreements.
 - iii. All labor costs shall be substantiated by evidence submitted by the Contractor and found acceptable by the Commissioner.
 - b. Material
 - i. The Contractor shall be paid for the actual cost of necessary materials, exclusive of sales tax, delivered to the job site for the performance of the work.

- c. Subcontractors
 - i. The labor and materials of subcontractors will be paid for on the same basis as for the Contractor. The Contractor may add ten (10) percent to the total of the subcontractor's labor and material cost as remuneration for administration.
 - ii. Only subcontractors which have received prior approval by the County shall be used in the execution of the Contractor's work.
- d. Equipment
 - i. Payment for the use of construction equipment (exclusive of hand tools and minor equipment), with the prior approval of the County for use, which is owned by the Contractor, will be paid for at the rate published in the Rental Rate Blue Book, exclusive of sales tax.
 - ii. Payment for equipment which is rented (exclusive of hand tools and minor equipment), with the prior approval of the County for use, will be paid for on the basis of submittal of an original paid invoice , including sales tax as may be required by law.
 - iii. Equipment which is rented (exclusive of hand tools and minor equipment), with the prior approval of the County for use, will be paid for on the basis of submittal of an original paid invoice, including sales tax as may be required by law.
- e. Overhead and Profit
 - i. Twenty (20) percent of the total of material and labor costs as specified in the foregoing paragraphs as compensation for profit and overhead.
 - ii. This includes all items of profit and all other costs or expenses, including administration, overhead, fees, superintendence, other required insurance, minor equipment, etc.
- e. The Contractor shall furnish satisfactory proof of all labor performed, materials furnished and equipment used in the performance of the Force Account work. Original invoices must be submitted to support all requests for payment.

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[END OF SECTION]

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SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 General Requirements

- A. In addition to the requirements for submittals identified elsewhere in these specifications, Contractor shall submit information as follows:

1.02 Shop Drawing Schedule

- A. In order to maintain the schedule for each Work Order, the Contractor shall submit all Shop Drawings within fifteen (15) days after the issuance of the Work Order.
- B. The Shop Drawings shall be submitted in accordance with the requirements of Section 01340, "Shop Drawings, Product Data and Samples."

1.03 Approval of Material and Equipment

- A. Approval of Materials and Equipment Suppliers and Manufacturers
 - 1. The Contractor shall submit to the Commissioner for approval a list of materials and equipment suppliers and manufacturers who are to furnish items of materials or equipment.
 - 2. Where the acceptability of any equipment or material specified herein is conditioned upon that item having a record of satisfactory operation for a specified period of time, such acceptability may be considered lacking such record, only if the manufacturer and/or supplier can provide a bond or cash deposit which will guarantee replacement at no cost to the County in the event of failure occurring prior to the expiration of the experience record term specified. The item proposed must meet all other technical requirements stipulated in the Specifications.
 - 3. If the materials and equipment submitted are offered as substitutes to the Contract Documents the Contractor shall advise the County of the substitutions and comply with the requirements hereinafter specified in Section 01640, "Substitution of Equipment or Materials and "Or Equal" submissions."

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1.04 Daily Work Reports

- A. The Contractor shall submit a copy of his daily work report to the County Representative at the end of each working day when actual field work has occurred. This report shall include all labor and specific activities performed as well as equipment and materials used and installed.

1.05 Additional Submittals

- A. The Contractor's attention is directed to Article 31 of the Agreement, "Labor Laws and Notice of Employees' Rights", and the requirements contained therein.

[END OF SECTION

SECTION 01310
CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.01 General Requirements

- A. The Contractor shall, as part of his cost proposal, submit a schedule outlining the duration of the various tasks comprising the Work Order.

1.02 Construction Schedule

- A. The Agreement and General Conditions shall be augmented to include the following:
1. The construction schedule shall be presented in the form of a bar graph indicating proposed progress vs. actual progress.
 2. The Contractor shall submit for approval two (2) prints of his proposed schedule to the County and shall revise same until approved by the County.
 3. The Contractor shall submit an up-to-date construction schedule along with all requisitions for payment.
 4. As required, the Contractor shall submit a Materials and Equipment Procurement List indicating when materials are to be ordered and when materials are expected on the job site.
- B. The initial construction schedule shall be submitted concurrently with the cost proposal. Approval of the cost proposal shall be contingent upon the approval of the construction schedule.
- C. The Contractor shall notify the County in writing of any delay or deviation from the approved construction schedule.

[END OF SECTION]

SECTION 01340
SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.01 General Requirements

- A. To avoid delays in the progress of the Work, the Contractor, within fifteen (15) days after the issuance of a Work Order, shall submit to the County all shop drawings, materials, equipment and samples required for completion the scope of work.
- B. The Contractor shall submit shop drawings, material, equipment and samples for review in accordance with the Contract Documents, as modified in the detailed specifications, and as further modified herein. The County will review and return submittals. Re-submission by the Contractor shall be within seven (7) working days of receipt.

1.02 Materials and Equipment

A. Suppliers and Manufacturers

- 1. Within fifteen (15) days after issuance of a Work Order, the Contractor shall submit to the County a list of materials and equipment suppliers and manufacturers for approval in accordance with the requirements of this Section and Section 01640, "Substitution of Equipment or Materials and 'Or Equal' Submissions."

B. Material and Equipment Orders Schedule

- 1. Within fifteen (15) days after issuance of a Work Order, the Contractor shall prepare and submit his tabulation of principal items of equipment and materials to be purchased to the County for review and approval.
- 2. The schedule shall be revised as required prior to approval by the County.
- 3. An updated copy of the schedule shall be submitted to the County with the application for partial payment.
- 4. The schedule shall be updated biweekly and one copy submitted to the County.
- 5. Schedule shall be submitted until all of the data is incorporated into the schedule for the work order.

C. Form of Schedule

1. Schedule shall be in tabular form with appropriate spaces to insert the following information for principal items of equipment and materials:
 - a. Date on which shop drawings are requested and received from the manufacturer.
 - b. Dates on which certification is received from the manufacturer and transmitted to the County.
 - c. Dates on which shop drawings are submitted to the County and returned by the County for revision.
 - d. Dates on which shop drawings are revised by manufacturer and resubmitted to the County.
 - e. Date on which shop drawings are returned by County annotated "Reviewed, No Exceptions Taken".
 - f. Date on which accepted shop drawings are transmitted to manufacturer.
 - g. Date of manufacturer's scheduled delivery.
 - h. Date on which delivery is actually made.

1.03 Shop Drawings

- A. Within fifteen (15) days after the issuance of a Work Order, the Contractor shall prepare and submit all shop drawings to the County for review and approval.
- B. Shop drawings shall be submitted without fail in time to permit correction, re-submission and final approval, as hereinafter specified, without causing any delay in the construction of any work. The Contractor may begin the preparation of shop drawings as soon as possible after approval of his cost proposal. Formal submission of shop drawings will begin after issuance of the Work Order.

D. Shop Drawing Requirements

1. Where the nature of the work of the Contract makes it necessary, or where so required by the County, the Contractor shall submit scale and full size

shop drawings of the work for the approval of the County. The shop drawings shall be complete in every detail including provisions required of various trades, connections with other work, all cutting, fitting and drilling required and any and all other necessary information in accordance with usual trade practice as particularly required for any special purposes.

2. Shop drawings include, but are not limited to, shop drawings, layout and installation drawings in plan and elevation, certified wiring diagrams, interconnecting wiring diagrams, manufacturer's data, etc. Contractor shall be responsible for securing all of the information, details, dimensions, drawings, etc., necessary to prepare the Shop Drawings required and necessary under this Contract and to fulfill all other requirements of his Contract. Contractor shall secure such information, details, drawings etc. from all possible sources including the Contract Drawings, drawings prepared by subcontractors, suppliers, etc.
3. All shop drawings submitted by the Contractor which involve a change at variance with the Contract Drawings shall be noted by the Contractors by advising the County in writing as to the recommended change and the reason therefore.
4. Contract Drawings are for engineering and general arrangement purposes only and are not to be used as shop drawings.
5. Shop drawings shall accurately and clearly present the following:
 - a. All working and installation dimensions (all measurements to be field verified).
 - b. Arrangement and sectional views.
 - c. Units of equipment in the proposed positions for installation details of required attachments and connections and dimensioned locations between units and in relation to the structures.
 - d. Necessary details and information for making connections between the various trades including, but not limited to, power supplies and interconnecting wiring between units, accessories appurtenances, etc.
 - e. Kinds of materials and finishes.
 - f. Reference to Contract drawings and Specification Section Number.

6. Structural and all other layout drawings prepared specifically for the Project shall have a plan scale of not less than 1/4-inch equal to 1 foot and they shall be not larger than 24" x 36".
7. Where manufacturer's publications in the form of catalogs, brochures, illustrations, compliance certificates, or other data sheets are submitted in lieu of prepared shop drawings, such submissions shall specifically indicate the item for which approval is requested. Identification of items shall be made in ink, and submissions showing only general information are not acceptable.
8. The Contractor shall provide all required copies for the use of the various trades and at the site.
9. A submittal record form shall accompany each submittal. A copy of the record form will be provided by the County. This is the only form to be used by the Contractor for his submittals.
10. Contractor Responsibilities
 - a. Before submitting shop drawings to the County, all submittals from subcontractors, manufacturers or suppliers shall be sent directly to the Contractor for preliminary review, coordination and checking. Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of material or equipment. Contractor shall thoroughly check all drawings for accuracy and conformance to the intent of the Contract Documents. Drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors, manufactures, or suppliers by the Contractor for correction.
 - b. All submittals, including shop drawings prepared by or under the direction of the various Contractors, shall be thoroughly checked by the Contractor for accuracy and conformance to the intent of the Contract Documents before being submitted to the County and shall bear the Contractor's signature of approval certifying that they have been so checked. Submittals without the Contractor's signature of approval will not be reviewed by the County and will be returned to the Contractor stamped "Rejected". Before submitting them to the County, all submittals shall be bound, properly labeled and consecutively numbered. Submit shop drawings with a letter of transmittal, containing the name of the project, Contractor's name, number of drawings, titles and other pertinent data.

- c. Shop Drawings shall be submitted as a single package including all associated drawings for any operating system and shall include all items of equipment and any mechanical units involved or necessary for the functioning of such system. Where applicable, the submittal shall include elementary wiring diagrams showing circuit functioning and necessary interconnection wiring diagrams for construction.
- d. If the submittals contain any departures from the Contract Documents, specific mention thereof shall be made in the Contractor's letter of transmittal. Otherwise, the review of such submittals shall not constitute approval of the departure. The Contractor shall call the County's attention to any changes by the use of large rubber stamp, or by larger letters on shop drawings. If this is not done, even if the work is incorporated in the construction, it will not be accepted by the County, even if shop drawings are "Reviewed, No Exceptions Taken".
- e. No materials or equipment shall be ordered, fabricated or shipped or any work performed until the County returns to the Contractor the submittals herein required, annotated "Reviewed, No Exceptions Taken".
- f. Where errors, deviations, and/or omissions are discovered at a later date in any of the submittals, the County's prior review of the submittals does not relieve the Contractor of the responsibility for correcting all errors deviations and/or omissions.

11. Procedure for Review

- a. Shop Drawings will be checked for design conformance with the Contract Documents and general arrangement only.
- b. Submittals shall be transmitted in sufficient time to allow the County adequate time for review and processing so as not to delay the work.
- c. Submit a minimum of six (6) copies of standard manufactured items, in the form of manufacturer's catalog sheets, showing illustrated cuts of the item to be furnished, scale details, sizes, dimensions, wiring diagrams and controls, and all other pertinent information. Two (2) copies of reviewed and/or disapproved submissions will be returned to the Contractor.

- d. For all other shop drawings, submit one (1) transparency (ozalid type) and three (3) prints for each drawing until final "Reviewed, No Exceptions Taken" is obtained. On each drawing transparency, provide clear space approximately 5" x 7" on the right side for stamps: "Date Reviewed:", "Reviewed,", etc.
- e. Submittals shall be accompanied by a submittal record form hereinbefore specified and shall be accompanied with any notification of departures and any pertinent data to facilitate review. If data for more than one Section of the specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section. A number shall be assigned to each submittal by the Contractor starting with the Number 1 and thence numbered consecutively. Re-submittals shall be identified by the same number followed by the suffix "A" for the first re-submittal and the suffix "B" for the second re-submittal, etc.
- f. Submittals will be annotated by the County in one of the following ways:
"Approved" - no exceptions are taken.

"Approved as Noted" - minor corrections are noted and shall be made and a re-submittal is required.

"Revise and Resubmit" - major corrections are noted and shall be made and a re-submittal is required.

"Rejected" - Based on the information submitted: the submission is not in conformance with the Contract Documents; the deviations from the Contract Documents are too numerous to list and a completely revised submission of the proposed equipment is required; or, a submission of other equipment is required.

or

Reproducible transparencies and resultant prints are not legible and will not be reviewed and a re-submittal is required.

- g. If a submittal is satisfactory to the County, the County will annotate the submittal, **"Approved"** and return two (2) copies to the Contractor. If reproducible transparencies are submitted, the County will retain the copies and return the reproducible transparencies to the Contractor.

- h. If a re-submittal is required, the County will annotate the submittal **"Approved as Noted"** or **"Revise and Resubmit"** or **"Rejected"** and return three (3) copies to the Contractor for appropriate action. If reproducible transparencies are submitted, the County will retain the copies and return the reproducible transparencies to the Contractor, plus two prints. The Contractor shall resubmit in accordance with the requirements hereinbefore described.
- i. Contractor shall revise and resubmit submittals as required by the County until submittals are **"Approved"** by the County.
- j. Approval of a Shop Drawing by the County will constitute approval of the subject matter for which the Drawing was submitted and not for any other structure, material, equipment or appurtenances shown.

1.04 Samples

A. General

- 1. Where required in the specifications for the various trades or otherwise requested by the County, samples of any material to be used and of the finish to be applied in the work, shall be submitted by the Contractor for approval in accordance with the requirements outlined below. Samples shall be of such a nature to fully illustrate the character of the finished work or as may be more fully described in the specifications.
- 2. Samples shall be furnished so as not to delay fabrication, allowing the County reasonable time for the consideration of the samples submitted.
- 3. Contractor shall store and protect large samples and mock-ups until the Project is complete or until a time approved by the County.
- 4. Accepted samples will establish the standards by which the completed work will be judged.
- 5. Samples and Shop Drawings which are related to the same unit of work or Specification Section shall be submitted at the same time. If related Shop Drawings and Samples are submitted at different times, they shall not be reviewed until both are furnished to the County.

B. Samples

- 1. Samples shall be of sufficient size or quantity to clearly illustrate the quality, type range of color, finish or texture and shall be properly identified.

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2. Samples shall be checked by the Contractor for conformance to the Contract Documents before being submitted to the County and shall bear the Contractor's stamp of approval certifying that they have been checked.
3. Submission of Samples shall conform to all applicable provisions under Shop Drawing Submittal and Correspondence Procedure and as further described below.
4. Samples shall be submitted in triplicate and each sample shall be identified with the name and number of the project, reference to Specification Section, Contract Drawings number, nature of the material, trade name of manufacturer and the location of its intended placement. Written approval shall be obtained, and the work furnished shall conform strictly to the samples approved by the County. No approval of a sample shall be taken in itself to change or modify any of the requirements of the Contract.
5. Transportation charges on samples submitted to the County shall be prepaid by the Contractor. If the Contractor requires a sample for his use, he shall notify the County in writing.
6. If samples are disapproved, the Contractor shall make all corrections required and shall resubmit the required number of new samples until approval is received.

C. Job Mock-Ups

1. Job mock-ups (sample panels) shall be constructed on Site by the Contractor and only one of each type will be required. Mock-ups shall be constructed only after the individual samples and components used in the mock-up have been approved by the County. If a mock-up is not approved, Contractor shall construct additional ones until approval is received.

D. Samples for Tests

1. Contractor shall furnish such samples of material as may be required for examination and test. All samples of material for tests shall be taken according to standard methods and as required by the Contract Drawings.

[END OF SECTION]

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SECTION 01410 TESTING

PART 1 - GENERAL

1.01 General Requirements

- A. The County reserves the right to test any and all materials being manufactured expressly for this Contract, offered to be furnished or delivered at the site, or installed in place. The Contractor will be required to cooperate with the County's Testing Laboratory in their sampling and testing.
- B. Certificates of Manufacture: When no direct test, inspection or analysis of materials, products or equipment is required at the point of manufacture, and when the County so requires, the Contractor involved shall furnish to him authoritative evidence in the form of Certificates of Manufacture that the materials, products or equipment to be used in the work have been manufactured and tested in conformity with the specifications. These certificates shall include six (6) copies of the results of physical tests and chemical analysis where necessary, that have been made directly on the product, or on similar products being fabricated by the manufacturer. The costs of furnishing Certificates of Manufacture and the results of tests of analysis shall be borne by the Contractor involved and shall be deemed to be included in his Unit Price(s).
- C. The County's Representative will determine and designate from time to time, as the work progresses, the materials that shall be tested. The County's Representative may select at random from any shipment or shipments of any materials delivered at the site, several samples of the materials for the purpose of testing them, and in the event that such samples do not conform in all respects to the requirements of the Specifications, then the entire shipment or shipments of materials, whether installed or not, will be rejected by the County and shall be removed forthwith from the premises by the Contractor supplying same, who shall make good all damages suffered by the County due to such rejections.
- D. If the County's Representative considers it necessary or advisable to test built-up fabricated finished material, the County will reimburse and pay the Contractor the cost of the unit destroyed by the test, provided the unit so tested and destroyed meets with all the requirements of the Specifications.
- E. If, at any time before Final Acceptance of the entire work, the County considers it necessary or advisable to properly examine any part of the work already completed by removing or tearing out the same, the Contractor supplying same shall, upon request, furnish promptly all necessary labor and materials required to tear out and remove the work.

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- F. If such work is found to be defective in any respect, due to the fault of the Contractor or any subcontractor, or any of his subcontractors, or if any of the work shall be covered over without the approval or consent of the County's Representative (whether or not the same shall be defective) the Contractor shall be liable for the expense of such examination and of satisfactory reconstruction.
- G. If, however, such approval and consent shall have been given, and such work is found to meet the requirements of this Contract, the Contractor supplying same shall be re-compensated for the expenses of such examination and reconstruction in the manner herein provided for the payment of costs of Force Account work.
- H. All tests will be performed by the County's Testing Laboratory, who will pay for all such tests, unless the tests show that the materials tested are not in accordance with the requirements of the Specifications, in which case the Contractor shall pay for the tests.
- I. In the event of tests of electrical apparatus or equipment, all necessary connections for such tests shall be furnished by the Contractor.
- J. Testing of various mechanical systems shall be as specified in detail under the applicable Sections.

[END OF SECTION]

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SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 General Requirements

- A. Construction facilities and temporary controls shall be provided in the manner and by the Contractor as described hereinafter.
- B. Contractor shall coordinate and install all construction facilities and temporary controls in accordance with the requirements of the local authorities or utility companies having jurisdiction and in accordance with all state, federal and local codes and regulations.
- C. At the completion of the Work, or when the construction facilities and temporary controls are no longer required, subject to the approval of the County, the construction facilities and temporary controls shall be removed and the facilities restored to their original conditions by the Contractor.
- D. Costs in connection with the temporary water, electric, lighting, heating and ventilation, and other miscellaneous construction facilities and temporary controls including but not limited to, installation, maintenance, relocation and removal shall be borne by the Contractor.

1.02 Protection of Work and Materials

- A. Protection Requirements:
 - 1. During the progress of the Work and up to the date of Final Payment, the Contractor shall be solely responsible for the care and protection of all Work and materials covered by the Contract. In order to prevent damage, injury or loss, actions shall include, but not be limited to, the following:
 - a. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the work of any other contractor or utility service company.
 - b. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.
 - c. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.

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- d. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the Site of the Work shall present a safe, orderly and workmanlike appearance.
 - e. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other dangerous areas as deemed necessary by the County.
- 2. The Contractor shall protect the existing Work and material from damage by his workmen and shall be responsible for repairing any such damage at no additional cost to the County.
 - 3. The Contractor shall, at the end of each work day, provide suitable protection of the completed roofing work and provide temporary facilities to ensure the water tightness of the building. **Verification of this protection and the water tightness of the building shall be demonstrated by appropriate water testing to ensure that no water will enter the building.** Any damage to new work, existing equipment, building structures or contents, due to the failure of the Contractor to provide proper protection from the elements, shall be repaired and/or replaced at the Contractors expense.

B. Maintenance of Egress:

- 1. During the course of Work of this Contract, the Contractor shall maintain and keep free of debris, materials or equipment points of required egress in accordance with the requirements of the Nassau County Fire Commissioner and Fire Safety Regulations.
- 2. The Contractor in his particular area of Work shall maintain egress as hereinbefore specified, be permitted to store or stockpile material. Debris or other material shall be removed daily which may obstruct personnel from operating or maintaining active equipment and piping.

C. Protection of Existing Structures:

- 1. Surface Structures:
 - a. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, piles, wires, posts, fencing, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

- b. Contractor shall sustain in their places and protect from direct or indirect injury all surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the Work of sustaining and supporting such structure, Contractor shall satisfy the County that the methods and procedures to be used have been approved by the party owning same.
- c. Contractor shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits to the Work. Contractor shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. Contractor shall repair immediately all damage caused by his Work to the satisfaction of the owner of the damaged structure.
- d. All other existing surface facilities, including but not limited to guard rails, posts, guard cables, signs, fencing, poles, markers, and curbs, which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at Contractor's expense.

2. Protection of Floors and Roofs:

- a. Contractor shall protect floors, roofs and stairs from overloads, dirt and damage during entire work duration. In areas subject to foot traffic, secure heavy paper, sheet goods, or other materials in place. For storage of products, lay tight wood sheathing in place. Cover walls and floors of elevator cars and surfaces of elevator car doors used by Contractor personnel.
- b. Proper protective covering shall be used when moving heavy equipment, when handling materials or other loads, when painting, when handling mortar and grout and when cleaning walls and ceilings.
- c. Use metal pans to collect all oil and cuttings from pipe, conduit, or rod threading machines and under all metal cutting machines.
- d. Concrete floors less than 28 days old shall not be loaded without written permission of County. No floor, roof or slab shall be loaded in excess of the design loading shown on the Drawings.

- e. Roof slabs shall not be loaded without written permission of County. Prohibit use of finished roofing surfaces for traffic of any kind, and for storage of any products. When activity must take place in order to carry out the Work, obtain recommendations of installer for protection of surface. Install recommended protection and remove on completion of that activity. Restrict use of adjacent unprotected areas.
- f. Contractor shall restrict access to roofs and keep clear of existing roofs except as required by the Work.
- g. If access to roofs is required, roofing, parapets, openings and all other construction on or adjacent to roof shall be protected with suitable plywood or other approved means.

D. Protection of Installed Products:

- 1. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.
- 2. Control traffic to prevent damage to equipment, materials and surfaces.
- 3. Provide covering to protect equipment and materials from damage.
 - a. Cover projections, wall comers, and jambs, sills and soffits of openings, in areas used for traffic and for passage of products in subsequent Work.

1.03 Security

- A. It shall be the responsibility of the Contractor to make whatever provisions he deems necessary to safely guard all Work, materials, equipment and property from loss, theft, damage and vandalism. Contractor's duty to safely guard property shall include the County's property and other private property from injury or loss in connection with the performance of the Contract.
- B. Contractor may make no claim against the County for damage resulting from trespass.
- C. Contractor shall make good all damage to property of County and others arising from failure to provide adequate security.
- D. If existing fencing or barriers are breached or removed for purposes of construction. Contractor shall provide and maintain temporary security fencing equal to the existing in a manner satisfactory to the County.

SECTION 01510
TEMPORARY UTILITIES AND SERVICES

PART 1 - GENERAL

1.01 General Requirements

- A. The County shall make available to the Contractor basic utilities (electric) and services (water) at the work site.
- B. The Contractor shall be responsible, and shall pay all costs, for all utilities and services required in excess of that available at the work site.

1.02 Temporary Power

- A. Electrical power for temporary lights and hand tools will be made available from the existing electrical system at points designated by the County. The Contractor shall furnish and install all equipment, materials and labor necessary for utilization of the electrical power.
- B. The County reserves the right to approve methods, equipment, routing, etc. to be utilized for electrical power.
- C. Any temporary wiring shall be performed in accordance with the requirements of the National Fire Protection Association, whose temporary certificate of inspection from the New York Board of Fire Underwriters shall be obtained and delivered to the County Representative, and the local utility company.
- D. When directed by the County, the Contractor shall remove from the premises all temporary light and electrical power wiring and equipment furnished and installed by him.

1.03 Temporary Water

- A. Temporary water will be made available from the existing water distribution piping at points as designated by the County. The Contractor shall furnish and install all equipment, materials and labor necessary for utilization of the temporary water.
- B. The County reserves the right to approve methods, equipment, routing, etc. to be utilized for temporary water.

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1.04 Temporary Sanitary Facilities

- A. Temporary sanitary facilities shall be provided by the Contractor as required for the use of his personnel. Contractor's personnel will not be permitted to utilize County sanitary or toilet facilities.
- B. Temporary sanitary facilities shall be screened from public observation.
- C. Temporary sanitary facilities shall not be connected to the local sanitary sewer system and the contents of same shall be removed and disposed of in a satisfactory manner.

[END OF SECTION]

SECTION 01640
SUBSTITUTION OF EQUIPMENT OR MATERIALS
AND "OR EQUAL" SUBMISSIONS

PART 1 – GENERAL

1.01 General Requirements

- A. Unless otherwise specified, all materials and equipment incorporated in the work under these contract shall be new.
- B. Whenever proprietary references are made in the technical specification, the use of manufacturer's or brand names are intended to establish a standards of type, quality and function of the required material or equipment. Where several of such proprietary references are given for any item of material or equipment, at least one will include a specific catalog number or other identifying designation. The products of the other listed manufacturers must, in the opinion of the Commissioner, be equivalent to the product so identified. The fact that one or more of the other manufacturers listed does not provide material essentially meeting the standards of the referenced manufacturer or other specifications, requirements shall not relieve the Contractor of responsibility for providing materials complying with such requirements. The fact that manufacturers' names are specified for any item need not be construed as implying that such item need not comply with any additional performance, construction or other requirements specified for the item. In all cases, the specification requirements shall take precedence over the manufacturer's standard.
- C. Throughout the specification, types of materials may be specified by manufacturer's name and catalog number in order to establish standards of quality and performance and not for the purpose of limiting competition. Unless specifically stated otherwise, the Bidder may assume the phrase "or approved equal," except that the burden is upon the Contractor to prove such equal quality, as stated in paragraph "E."
- D. Whenever reference is made in the specifications to any articles, devices, products, materials, fixtures, forms or types of construction by manufacturers' names, makes or catalog numbers, the products of such manufacturers shall be used, except that requests for substitutions or "or equal" products may be requested. Requests for substitutes and "or equal" products shall be proposed in writing to the Commissioner. Such requests shall conform to the following requirements:
 - 1. Requests for substitutions will be received and considered from the Prime Contractor only and not from manufacturers, vendors, suppliers, subcontractors or other parties.

- E. Only those products originally specified and/or added by approved requests for substitutions submitted in accordance with the preceding paragraph may be used in the work. Whenever requests for substitutions or "or equal" products are approved, it shall be understood that such approval is conditional upon strict conformance with all requirements of the Contract and further subject to the following:
1. Any material or article submitted for approval in accordance with the above procedure must be equal, in the sole opinion of the Commissioner, to the material or article specified. It must be readily available in sufficient quantity to prevent delay of any work, inspection or test; it must be available in a reasonably equivalent range of colors, textures, dimensions, gauges, types and finishes as the material or article specified; it must be equal to the specified item in strength, durability, efficiency, serviceability, ease and cost of maintenance; it must be compatible with the building design and not necessitate design modifications by the County; its use must not impose additional work on, or require changes in, the work of any other Contractor or vendor without the written agreement of such Contractor or vendor.
 2. The Contractor must also state the cost difference involved, calculations, supporting data, and samples, if required, to permit a fair evaluation of the proposed substitute with respect to quality, serviceability, location and name of service agency, warranty and cost.
 3. Request for all substitutions shall be accompanied by all information needed for the Commissioner to make an evaluation, including manufacturer's brand or trade names, model numbers, description or specification of item, performance data, test reports, samples, history of service, and other data as applicable.
 4. The Commissioner reserves the right to disapprove, for aesthetic reasons, any material or equivalent on the basis of design or color considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required colors or design.
 5. All requests for substitutions of materials or other changes from the contract requirements, shall be accompanied by an itemized list of all other items affected by such substitution or change. The Commissioner shall have the right, if such is not done, to rescind any approval for substitutes or changes and to order such work removed and replaced with work conforming to requirements of the Contract, all at the Contractor's expense; or to assess all additional costs resulting from the substitution to the Contractor.

- F. All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the manufacturer's printed instructions, unless otherwise specified.

[END OF SECTION]

SECTION 01680
USE OR OCCUPANCY BY COUNTY

PART 1 - GENERAL

1.01 General Requirements

- A. Nassau County has the right to occupy or use ahead of Schedule all or any substantially completed or partially completed portion of the work when such occupancy and use are in its best interest, notwithstanding the time of completion for all of the work.
- B. Should such action be taken by the Commissioner, the Contractor's guarantee on that part of the work placed into use shall begin on the date such use by the County shall begin, subject to completion of punch list items.
- C. Beneficial occupancy by the County shall not be deemed as the final acceptance of the work.
- D. Immediately prior to such occupancy or use, inspection of the part to be occupied or used, will be made by the County Representative and a punch list will be formulated indicating all outstanding items remaining uncompleted at the beginning of this occupancy. The Contractors will be furnished in writing with a statement of the work, if any, which is still to be done on such part.
- E. The Contractor's guarantee on that part of the work occupied before final completion by the County shall begin after the items specified in the punch list have been corrected.
- F. After Nassau County has taken occupancy of all or any substantially completed portion of the building under construction, the Contractor shall not disrupt Nassau County's use and occupancy thereof to perform any type of work, but shall at Nassau County's discretion, provide the work after Nassau County's normal working hours.

[END OF SECTION]

SECTION 01710 CLEANING

PART 1 - GENERAL

1.01 General Requirements

A. Rubbish Removal and Cleaning

1. The Contractor shall remove from the building and dispose of all debris resulting from the work of this Contract, at least once a week and more often if same interferes with County operations, or presents a fire or other hazard. All debris and excess material shall be removed from the County property. Burying of any debris or excess material within the premises will not be permitted. Burning of same will be strictly forbidden.

B. Owner's Right to Clean

1. Should the Contractor fail, refuse or neglect to remove rubbish and waste materials and temporary work, or clean the buildings and premises as required herein, then the County may, or shall, without obligation to do so, remove and dispose of said rubbish, waste materials and temporary work, and clean the buildings and premises, and deduct the cost thereof from any money due or to become due the Contractor under his Contract.

C. Removal of Food Wastes

1. The Contractor shall provide a sufficient number of metal containers at various locations for food wastes by use of all construction personnel. Food wastes shall be removed from the site each day.

D. Cleaning and Protection of Work

1. During construction, all parts of all Work installed under this Contract shall be completely protected from damage or marring. Any Work damaged or marred shall be immediately restored to original condition or replaced by the Contractor.

1.02 Final Cleaning

- A. At the completion of the Work, Contractor shall remove all rubbish from and about the Site of the Work, and all temporary structures, construction signs, tools, scaffolding, materials, supplies and equipment which he or any of his Subcontractors may have used in the performance of the Work. Contractor shall broom clean paved surfaces and rake clean other surfaces of grounds. Regrade, top dress and seed any grass areas disturbed by construction activities.

- B. Contractor shall thoroughly clean all materials, equipment and structures; all marred surfaces shall be touched up to match adjacent surfaces; dirty filters and burned-out lights replaced as required; all glass surfaces cleaned and floors cleaned and polished so as to leave Work in a clean and new appearing condition.
- C. Remove spatter, grease, stains, fingerprints, dirt, dust, labels, tags, packing materials and other foreign items or substances from interior and exterior surfaces, equipment, signs and lettering.
- D. Remove paint, clean and restore all equipment and material nameplates, labels and other identification markings.
- E. Contractor shall maintain cleaning until Project, or portion thereof, is occupied by the County.

[END OF SECTION]

SECTION 01720
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 As-Built Drawings by Contractor

- A. When the work designated under each Work Order reaches the fifty (50) percent completion point, the Contractor shall prepare "**As-Built Drawings**" of the work completed to date. The as-built drawings will be prepared as mylar litho reproducibles. Two (2) sets of prints of the same shall be submitted to the County for approval. All Drawings shall bear stamp "**Record Drawing of (Work Order Description) Work As-Built**" as of (date), and shall be signed by a principal of the Contractor's firm.
- B. Subsequent to the fifty (50) percent completion point, the Contractor shall keep accurate current records of all the Work and indicate the actual construction details on the mylar litho reproducibles. The as-built drawings maintained by the Contractor shall be available for monthly review by the County Representative and if not acceptable may be cause for withholding approval of Contractors' payment requisition.
- C. After 100% completion of the work, submit two (2) sets of prints of the as-built drawings to the County Representative for approval.
- D. When all revisions to the As-Built drawings showing the Work as actually constructed are made, the corrected mylar reproducibles and one (1) set of prints shall be delivered to the County's Representative before approval of the final request for payment for the completed Work will be made.
- E. The cost of furnishing the prints and preparing the As-Built Record Drawings shall be paid for by the Contractor and shall be included in the Unit Price(s) bid.

[END OF SECTION]

SECTION 01740
GUARANTEES, WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 General Requirements

- A. The Contractor is responsible for ensuring that all materials, installation procedures, details and personnel utilized for the work are acceptable to the roofing system manufacturer and the appropriate guarantee will be issued.
- B. The Contractor is responsible for arranging, attending, conducting, etc. all site inspections, conferences, tests, etc. required by the roofing system manufacturer for issuance of the appropriate guarantee.

1.02 Roofing Manufacturer's Warranty

- A. Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in the roof system resulting from defects in materials or workmanship for the applicable warranty period.
- B. At the completion of each work order the Contractor shall provide a no dollar limit roofing system guarantee issued by the roofing system manufacturer which covers both materials and workmanship for the time period indicated within the applicable technical specification section.
- C. The guarantee shall require that the roofing system manufacturer repair or replace any leaking or defective portion of the roof, at no cost to the County, and maintain the watertight integrity of the roofing system.

1.03 Roofing Installer's Warranty

- A. Submit a Roofing Installer's Warranty, signed by Installer, covering all roofing system components, including built-up roofing, base flashing, roofing insulation, fasteners, vapor barriers, etc., for the following warranty period:
 - 1. Warranty Period: (1) year from date of completion.
- B. Form of warranty shall be as provided in the applicable specification section for the type of roofing system installed.

[END OF SECTION]

SECTION 02112
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 Description of Work

- A. Work of this Section shall include all labor, materials, equipment and incidentals required to complete all selective existing demolition material , including but not necessarily limited to:
1. Removal of built-up roofing, single-ply roofing and insulation .
 2. Removal of asphalt shingles and base sheet .
 3. Removal of cedar roof shingles .
 4. Removal of gravel from singly-ply and built-up roofs .
 5. Removal of leaders and gutters .
 6. Removal of wood fascia and soffits .
 7. Removal of metal roof edge flashing, counter and other metal flashing, flashing, blocking, panels, etc., .
- B. Related Work Described Elsewhere:
1. Rough Carpentry - Section 06100
 2. Vapor Barriers - Section 07190
 3. Roof and Deck Insulation - Section 07240
 4. Traffic Topping - Section 07570
 5. Metal Flashing and Trim - Section 07620
 6. Gutters and Downspouts - Section 07631
 7. Manufactured Roof Specialties - Section 07710
 8. Sealants and Caulking - Section 07951
 9. Roof Drains - Section 15422

1.02 Protection

- A. Provide and erect all temporary planking, bridges, fences, bracing, dust control devices, shoring, lights and warning signs required by jurisdictional authorities and/or site conditions to protect persons, and adjacent on-site and off-site property.

- B. Leave all protection in place and maintain until demolition work has been completed and all danger of damage has passed. At such time as approved by the County Representative, remove all protections.

1.03 Existing Utilities

- A. Notify all utility and telephone service companies before starting work. Make arrangements with them for the removal or relocation of their equipment as required.

1.04 Ownership of Items to be Demolished

- A. Upon receipt by the Contractor of Notice to Proceed with the work on all or any part of the premises, all right, title and interest of the County in and to the property to be demolished and removed by the Contractor on said part or all of the premises described in such Notice shall be deemed to be vested in the Contractor, subject to any provisions of the Contract Documents.
- B. No right, title, property, or interest of any kind whatsoever in or to land or premises upon which such structures stand is created, assigned, conveyed, granted or transferred to the Contractor or any other persons, except only the license and right of entry to remove such structures in strict accordance with the Contract Documents.
- C. Property belonging to public bodies or public service companies, unless abandoned by such companies, shall not become the property of the Contractor by reason of transfer herein provided for, and the County does not warrant title to any such property.
- D. All salvage materials shall become the property of the Contractor, except as denoted by the County for reuse or recycling or as otherwise provided by other conditions stated herein.
- E. If the County terminates Contractor's right to proceed, all right and all title in and to structures, material and property hereby transferred to Contractor shall revert to and vest in the County without prejudice to any claim which the County may have against Contractor arising from Contractor's default.

1.05 Scheduling

- A. Owner shall occupy building during selective demolition activities.
- B. Schedule selective demolition operations so not to interfere with Owner's operations.
- C. Provide not less than seventy-two (72) hours notice to Owner prior to the commencement of selective demolition activities.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.01 Demolition Operations

- A. Use of explosives in execution of demolition work is prohibited under any conditions. Fire on premises, for burning debris and materials, is prohibited.
- B. Maintain constant dust control during all operations. Wet down walls and other structure parts prior to and during demolition. Wet down debris and materials. Wet down materials on trucks prior to leaving premises.
- C. As demolition operations proceed, shore roof properly to prevent any collapse of structure.
- D. All work shall be done in strict accordance with requirements of governing agencies of the County, State and Federal authorities having jurisdiction.
- E. Protect all building and site appurtenances including landscaping from falling objects and debris. Repair or replace any items damaged during demolition operations.
- F. Remove no more existing roofing than can be replaced in one (1) day by new roofing. See Division 7 for new roofing requirements. Provide temporary weather protection if necessary.
- G. Do not obstruct streets, walks or other adjacent facilities without the prior permission of the Owner and authorities having jurisdictions.
- H. Remove debris from elevated portions of buildings by chute, hoist or other device that will safely convey debris to grade level. Before removing debris from elevated portion of buildings, the contractor will make a visual inspection to insure that all windows and doors are completely closed, chute joints are properly fastened and chutes reach entirely inside the receiving dumpsters and County approved "Dust Control" methods are properly employed throughout entire process.

3.02 Cleaning

- A. At completion of each day's work operations, clean surrounding areas of any accumulation of debris, materials, dirt, etc., resultant from demolition operations.
- B. Do not allow debris, salvage materials, etc. to accumulate on site. Remove debris from site promptly.
- C. At completion of all demolition operations and prior to final payment, all debris, salvage materials, etc. shall be completely removed from the premises.

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SECTION 06100
ROUGH CARPENTRY

PART 1 - GENERAL

1.01 Description of Work

- A. Work of this Section shall include all labor, materials, equipment, plant and Incidentals required to complete all rough carpentry as specified herein.
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Vapor Barriers - Section 07190
 - 3. Roof and Deck Insulation - Section 07240
 - 4. Traffic Topping - Section 07570
 - 5. Metal Flashing and Trim - Section 07620
 - 6. Gutters and Downspouts - Section 07631
 - 7. Manufactured Roof Specialties - Section 07710
 - 8. Sealants and Caulking - Section 07951
 - 9. Roof Drains - Section 15422

1.02 Quality Assurance

- A. Lumber Standards: Comply with PS20 and grading rules of the following associations:
 - 1. Northeastern Lumber Manufacturers Association, Inc. (NELMA).
 - 2. Southern Pine Inspection Bureau (SPIB).
 - 3. West Coast Lumber Inspection Bureau (WCLIB).
 - 4. Western Wood Products Association (WWPA).
- B. Plywood Product Standards: Comply with PS 1 (ANSI A1 99.1) or for products not manufactured under PS 1 provisions, with applicable American Plywood Association (APA) Performance Standard for type of panel indicated.
 - 1. Plywood for Roof Sheathing to be 19/32" thick CDX, installed with grain perpendicular to rafters and spaces left for expansion.

06100-1

1.03 Submittals

- A. Material Certificates: Where dimensional lumber is provided to comply with minimum allowable unit stress, submit listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in form of a signed copy of applicable portion of lumber producer's grading rules showing design values for selected species and grade. Design values shall be as approved by the Board of Review of the American Lumber Standards Committee.
- B. Wood Treatment Data: Submit treatment manufacturer's instructions for proper use of each type of treated material.
 - 1. Pressure Treatment: for each type, include certification by treating plant.
 - 2. Water-Borne Preservatives: include statement that moisture content of treated materials was reduced to a maximum of 15% prior to shipment.

1.04 Product Handling

- A. Delivery and Storage: Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation within stacks.

1.05 Job Conditions

- A. Coordination: Fit carpentry work; scribe and cope as required for accurate fit. Correlate location of nailers, blocking, grounds, sleepers and similar supports to allow proper attachment of other work.

PART 2 - PRODUCTS

2.01 Materials

- A. Lumber, General:
 - 1. Factory-mark each piece of lumber with type, grade, mill and grading agency.
 - 2. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified.
 - a. Provide dressed lumber, S45, unless otherwise indicated.
 - b. Provide seasoned lumber with 19% maximum moisture content at time of dressing.

- B. Framing Lumber (2" through 4" thick):
 - 1. For light framing (less than 6" wide) provide No. 2 or standard grade, any species.
 - 2. For structural framing (6" and wider) provide Douglas Fir No. 1 grade.
- C. Miscellaneous Lumber:
 - 1. Provide No.2 or standard grade wood for support or attachment of other work including nailers, blocking, furring, grounds, stripping, sleepers and the like. Provide lumber of sizes indicated or required and worked into shapes shown.
 - 2. Provide treated lumber in compliance with 2.02 of this specification.
- D. Fascia and Soffit Trim:
 - 1. Clear pine for molded trim.
- E. Plywood:
 - 1. Trademark: Identify each panel with appropriate APA trademark.
 - 2. Provide APA Panels complying with requirements indicated for grade designation, span rating, exposure durability classification and thickness.
 - a. Roof Sheathing: Exposure Durability Classification: Exterior Span Rating: 16/0.
 - 3. Provide treated plywood in compliance with 2.02 of this specification.
- F. Fasteners and Anchorages: Provide size, type, material and finish as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nut, washers and anchoring devices. All fasteners and anchorages shall have a hot-dip zinc coating conforming to ASTM A153 or shall be fabricated from type 304 stainless steel.

2.02 Wood Treatment

- A. Preservative Treatment: Comply with applicable requirements of AWP Standards C2 (lumber) and C9 (plywood) and of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.

1. Pressure treat indicated items with water-borne preservatives complying with AWPB LP-2. After treatment, kiln-dry to a maximum moisture content of 15%.
 - a. Wood nailers, curbs, blocking, stripping, sleepers and similar members in connection with roofing and flashing, or members in contact with masonry or concrete.
 2. Coat cut surfaces of material with heavy brush coat of same chemical used for treatment.
- B. Fire-Retardant Treatment: Conform to the requirements of "non-Combustible Specification 903.8" of the BOCA Code and AWPB C20 for lumber and AWPB C27 for plywood. Mark each treated item with AWPB designation.

PART 3 - EXECUTION

3.01 Installation

- A. General:
1. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints of optimum joint arrangement.
 2. Set carpentry work accurately to required levels and lines, with members plumb and true and generally cut and fitted.
 3. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.
 4. Use common wire nails, or bugle head screws except as otherwise indicated. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.
- B. Wood Grounds, Nailers, Blocking and Sleepers:
1. Provide wherever shown and where required for attaching of other work Form to shapes as shown and cut as required for true line and level of work to be attached.
 2. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces.

C. Fascia and Soffits:

1. Use galvanized finish nails. Set and putty all nail heads, and sand smooth ready for paint.

D. Miscellaneous Wood Framing:

1. Provide framing members of sizes and on spacings shown. Do not splice members between supports.
2. Anchor and nail members to comply with requirements of the NY State Building Construction Code.

E. Installation of Plywood for Replacement of Roof Sheathing:

1. Screw plywood through existing wood deck into existing roof framing.
2. Screw all plywood at 6" o.c. along panel edges and 8" o.c. at intermediate supports.

3.02 Temporary Protection

A. Provide and install temporary protection in accordance with OSHA requirements, and as follows:

1. Temporary protection shall include wood railings, protection on roof openings, and the like; adequately maintained in good repair during the life of the Contract.
2. Provide substantial temporary wood covering over all openings left in roof, using rough planking at least 2" thick, cleated together and otherwise made sufficiently strong and put in place wherever required.

B. Remove all temporary protection when so directed.

[END OF SECTION]

**SECTION 07190
VAPOR BARRIERS**

PART 1 - GENERAL

1.01 Description of Work

- A. This Section includes the following:
 - 1. Vapor Barrier
 - 2. Venting Base Sheet
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Roof and Deck Insulation - Section 07240
 - 3. Built-Up Bituminous Roofing - Section 07510
 - 4. Traffic Topping - Section 07570
 - 5. Metal Flashing and Trim - Section 07620
 - 6. Gutters and Downspouts - Section 07631
 - 7. Gravel Stops - Section 07660
 - 8. Sealants and Caulking - Section 07951
 - 9. Roof Drains-Section 15422

1.02 Submittals

- A. Product Data: For each type of roofing product specified include data substantiating that materials comply with requirements.
- B. Samples for Verification: Submit samples of the following products in the sizes and numbers indicated:
 - 1. Six (6) venting base sheet fasteners of each type, length, and finish.
 - 2. 12" x 12" vapor barrier.
 - 3. 12" x 12" venting base sheet.

1.03 Delivery, Storage and Handling

- A. Deliver materials to job site on pallets in original, unopened packaging with legible labels. Package labels shall indicate product name, production date, product code and testing agency.

- B. Store roofing materials in a dry, warm, well-ventilated, weather tight location according to roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on end on pallets or other raised surfaces. Do not double-stack rolls.

PART 2 - PRODUCTS

2.01 Vapor Barrier

- A. Asphalt impregnated, glass-fiber felt, complying with ASTM D 2178, Type IV.

2.02 Venting Base Sheet

- A. Asphalt impregnated, glass-fiber felt, allowing the lateral movement of vapors, complying with ASTM D 4897, Type II.

2.03 Asphalt

- A. Air blown roofing grade asphalt, complying with ASTM D 312, Type IV.

2.04 Asphalt Primer

- A. Thin, cut-back asphalt used to prepare porous roof surfaces to receive hot asphalt and enhance adhesion.
- B. Product to comply with ASTM D 41.

2.05 Accessories

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions of FM 4470; designed for fastening venting base sheets and Hashing and for backnailing ply felts to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.

2.06 Acceptable Manufacturers

- A. Johns Manville
- B. GAF Materials Corporation
- C. Carlisle Corp., Or Equal

PART 3 - EXECUTION

3.01 Roof Deck Preparation

- A. The roof deck shall be smooth, clean, dry and free of debris.
- B. Any depressions, holes, deformations, etc. shall be made smooth prior to the installation or application of any new roofing system components.
- C. The roof deck shall be dry and free of moisture before the installation or application of any new roofing system components.

3.02 Venting Base Sheet and Vapor Barrier Installation

- A. Apply primer to roof deck at a nominal rate of one (1) gallon per 100 square feet. Allow to dry thoroughly prior to the application of other roofing materials.
- B. Venting base sheet shall be installed with minimum two (2) inch side laps and six (6) inch end laps. Attachment shall be in accordance with the Manufacturer's requirements considering the type of roof deck, the slope of the roof deck, etc.
- C. Vapor barrier shall be installed with minimum two (2) inch side laps and six (6) inch end laps. Attachment will be by a solid mopping of asphalt applied at a rate of twenty-five (25) pounds per 100 square feet and at appropriate application temperature.
- D. Apply subsequent roofing system components in accordance with the applicable specification section and the manufacturer's instructions.

[END OF SECTION]

SECTION 07240
ROOF AND DECK INSULATION

PART 1 - GENERAL

1.01 Description of Work

- A. This Section includes the following:
 - 1. Rigid Polyisocyanurate Insulation
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Vapor Barriers - Section 07190
 - 3. Built-Up Bituminous Roofing - Section 07510
 - 4. Traffic Topping - Section 07570
 - 5. Metal Flashing and Trim - Section 07620
 - 6. Gutters and Downspouts - Section 07631
 - 7. Gravel Stops - Section 07660
 - 8. Sealants and Caulking - Section 07951
 - 9. Roof Drains - Section 15422

1.02 Submittals

- A. Product Data: For each type of roofing product specified include data substantiating that materials comply with requirements.
- B. Submit layout drawings for insulation installation.
- C. Shop Drawings: Include plans, sections, details, and attachments to other work, for the following:
 - 1. Insulation Layout and Attachment
- D. Samples for Verification: Submit samples of the following products in the sizes and numbers indicated:
 - 1. Three (3) 12" x 12" squares of polyisocyanurate insulation.

1.03 Delivery, Storage and Handling

- A. Deliver materials to job site on pallets in original, unopened packaging with legible labels. Package labels shall indicate product name, production date, product code and testing agency.

- B. Store materials in a dry, warm, well-ventilated, weather tight location according to roofing system manufacturer's written instructions.
- C. Protect roofing insulation materials from physical damage, from being wind blown atop and off the roof, and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 -PRODUCTS

2.01 Insulation Materials

- A. General: Provide preformed, roofing insulation boards that comply with requirements, selected from manufacturer's standard sizes and of thicknesses required.
- B. Tapered insulation: Provide preformed, tapered insulation boards where required for sloping to drain. **Fabricate with the following taper:**
 - 1. **Slopes:**
 - a. **Minimum 1/8" per foot where roof deck is flat or level, or greater, as required to obtain a 20-year warranty from manufacturer.**
 - b. Minimum 1/4" per foot in areas where diversion of water migration is required.
 - c. Minimum 1/2" per foot, in areas around drains.
- C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where required for sloping to drain.
- D. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), Basis of Design: ENRGY 3
 - 1. Provide insulation package in multiple layers.
 - 2. Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch.
 - a. Determined in accordance with CAN/ULC S770 at 75°F (24°C)
 - b. Federal Specification HH-I-197212
 - c. PIMA Aged Testing Procedure 2 81-1
 - 2. Fiberglass reinforced mat face on both major surfaces, for use with built-up roofing and single-ply roofing systems.
 - 3. Acceptable Manufacturers:
 - a. Johns Manville
 - b. GAF Building Materials Corporation
 - c. Garland Company, Inc.

E. Polyisocynurate Insulation (Tapered)

1. Rigid closed cell polyisocynurate foam roof insulation board, factory tapered to provide required roof slope, complying with:
 - a. ASTM C 728
2. Acceptable Manufacturers:
 - a. Johns Mansville
 - b. GAF Building Materials Corporation
 - c. Garland Company, Inc.

F. Cover Board (for Cold Applied systems)

1. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs of compressive strength. Basis of Design: ProtectoR HD
 - a. Thickness: 1/2 inch (13 mm)
 - b. R-value: 2.5

G. Insulation Fasteners

1. Appropriate for purpose intended and approved by Factory Mutual and system manufacturer; length required for thickness of material with metal washers; provided by manufacturer. Minimum penetration 3/8"; minimum pull out resistance from deck is 400lbs.

G. Insulation Joint Tape

1. Asphalt treated glass fiber reinforced; 6 inches; self-adhering.

H. Substrate Board

1. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs of compressive strength. Basis of Design: ProtectoR HD
 - a. Thickness: 1/2 inch (13 mm)
 - b. R-value: 2.5

2. Gypsum Board: ASTM C 1177, Heavy duty coated glass-mat facer, water-resistant gypsum substrate for adhered roof applications, [5/8 inch (16 mm)] thick. Basis of design: DEXcell FA Glass Mat Roof Board or Dens Deck Prime Roof Board

PART 3 - EXECUTION

3.01 General Instructions

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system manufacturer's written instructions for installing, attachment, etc. of roofing insulation.
 - a. Provide a minimum of two (2) layers of insulation and (1) layer of ½” perlite backer board
 - b. For single ply or cold applied SBS system use High-Density Polyisocyanurate. Basis of Design: ProtectoR HD
- C. Total thickness and thermal value of all layers of insulation must at a minimum long term thermal Resistance (LTTR) of 30.
- D. Board Size: 48 x 48 inch
- E. Tapered design shall be provided by roof manufacturer.

3.02 Insulation Installation

- A. After installation of venting base sheet and vapor barrier, the area is to be tested to determine if existing roof provides positive drainage to existing roof drains. Where areas do not provide positive drainage, tapered insulation is to be provided and installed to obtain positive drainage.
- B. Install insulation over area of roofing to achieve required thickness in two (2) or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of six (6) inches in each direction.
- C. Trim surface of insulation where necessary at roof drains so completed surface is flush with ring of drain.

- D. Nailer Strips: Where roof slopes are greater than 1 inch per 12 inches (1:12), mechanically fasten to deck four (4) inch nominal wide wood nailer strips of same thickness as insulation, spaced not more than twenty (20) feet apart. Run nailers perpendicular to slope of roof.
- E. Install insulation with long joints of insulation in continuous straight lines with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
- F. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- G. Fasten insulation according to the insulation and roofing system manufacturer's written instructions.
- H. Follow the manufacturers approved shop drawings and instructions for installation of tapered insulation system and cricket system.
- I. Install the overlay insulation (backer board) over the tapered insulation system with joints staggered from each layer.
- H. Butt edges and ends snugly, joint widths over 1/8" will be taped. Tape joints of insulation in accordance with insulation manufacturer's instructions.

[END OF SECTION]

SECTION 07311
ASPHALT SHINGLE ROOFING SYSTEM

PART 1 - GENERAL

1.01 Description of Work

- A. This Section includes the following:
 - 1. Installation of new asphalt shingle roofing.
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Vapor Barriers - Section 07190
 - 3. Roof and Deck Insulation - Section 07240
 - 4. Traffic Topping - Section 07570
 - 5. Metal Flashing and Trim - Section 07620
 - 6. Gutters and Downspouts - Section 07631
 - 7. Manufactured Roof Specialties - Section 07710
 - 8. Sealants and Caulking - Section 07951
 - 9. Roof Drains - Section 15422

1.02 Quality Assurance

- A. Ratings: Provide UL Class "A" Fire Rating and Wind Resistance for the asphalt shingles.

1.03 Submittals

- A. Samples: Submit three (3) sample boards of the asphalt roofing shingles indicating the range of colors.
- B. Manufacturer's Data: Submit six (6) copies of the manufacturer's product literature for the asphalt shingles indicating all pertinent data required to show compliance with the requirements of this specification.

1.04 Product Handling

- A. Deliver materials to the project site in manufacturer's unopened packages with UL Labels.
- B. Store materials on raised platforms and protect with coverings at outdoor locations.

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1.05 Job Conditions

- A. Do not install underlayment or shingles on wet surfaces.
- B. Do not apply shingles when air temperature is below 40 degrees Fahrenheit.

PART 2 - PRODUCTS

2.01 Materials

- A. Underlayment: Fiberglass reinforced 30 Lb. asphalt saturated rag felt.
- B. Nails: Hot-dipped galvanized roofing nails; 1-1/2" long; 11 or 12 gauge; barbed shank; 3/8" min. head.
- C. Bituminous Plastic Cement SS-C-1 53C, Type I, Class A.
- D. Asphalt Shingles: Self-sealing, 290 Lb. minimum weight, random edged fiberglass based asphalt shingle with a UL Class "A" Fire Resistance and Wind Resistance rating. **Shingles shall have a 40 year manufacturer's warranty.**
 - 1. Approximate Size: 36" long x 12" to 14" wide, 5" to 6" exposure.
 - 2. Acceptable Manufacturers: provide one of the following:
 - a. GAF, Timberline HDZ
 - b. Mansville, Evalith
 - c. Owens Corning, Tru Definition Duration
- E. Hip and Ridge Shingles: Manufacturer's special hip and ridge shingles.
- F. Waterproof Underlayment: Fiberglass reinforced; self-adhering; self-sealing; min. 58 mil thickness.
 - 1. Acceptable Manufacturers:
 - a. GAF, Weatherwatch , StormGuard or approved equal.

PART 3 - EXECUTION

3.01 Inspection

- A. Decks with slope of 5 in 12 or greater:
 - 1. Fasten metal drip edge along bottom edge (eaves) before underlayment is laid and to the sides (rakes) after the underlayment is laid.
 - 2. Ice-Dam Protection: Apply a thirty-six (36) inch wide eave flashing strip of waterproof underlayment to overhang drip edge.
 - 3. Lay one layer of felt horizontally over entire roof, lapping each course over the lower course 2" minimum at horizontal joints, and 4" side lap at end joints.
 - 4. Lap felt 6" from both sides over hops and ridges.
 - 5. Secure underlayment to deck with fasteners (as per manufacturer's requirements) to hold in place until shingles are applied.
- B. Decks with slopes from 2 to less than 5 in 12:
 - 1. Apply two (2) layers of felt parallel with eaves, laying first 19" as starter course, overlapping with 36" second layer. Fasten metal drip edges as in A.I. above.
 - 2. Cover roof with 36" sheets of felt overlapping preceding layer by 19" exposing 17" of underlying sheet.
 - 3. Secure underlayment to deck with sufficient fasteners to hold in place until shingles are applied.
 - 4. Ice-Dam Protection: Provide a continuous layer of plastic asphalt cement applied at the rate of two (2) gallons per 100 square feet to the surface of the underlay starter course before the first full course is applied, and also to the 19" underlying portion of each succeeding course to a point at least 24" inside the wall line of the building before continuing up on the roof with non-cemented felts. Apply the cement uniformly with a comb trowel, so that at no point will felt touch felt when the application is completed. The overlying sheet is pressed firmly in the entire cemented area.

3.03 Installation of Flashing

- A. Install all copper flashing as specified in Section 07600 in accordance with the drawings. Flashing shall include the following:
 - 1. Drip edge.
 - 2. Open valley flashing.
 - 3. Step flashing and base flashing.
 - 4. Flashing at masonry chimney.
 - 5. Vent pipe flashing.

3.04 Installation of Starter Strip

- A. Apply 9" wide mineral surfaced roll roofing even with lower edge of the eaves; or
- B. Use shingles with tabs cut off as a starter strip.
- E. Starter strip shingles shall overhang the eaves and rake by $1/2"$. Fasten starter strip using same spacing as for shingles and locate fasteners about 3" up from the bottom edge. Avoid fastening where cut-outs will occur in the first course of shingles.

3.05 Installation of Asphalt Shingles

- A. General: Apply shingles in strict accordance with manufacturer's specifications.
- B. Install shingles in a random offset pattern throughout the entire roof surface.
- C. Fastening: All nails shall be located along the manufacturer's "fastening line". Place one nail 1" from each end and one 12" in from each end, for a total of 4 fasteners in each shingle.

[END OF SECTION]

SECTION 07312

WOOD SHINGLES AND SHAKES

PART 1 GENERAL

1.01 Description of Work

- A. This Section includes the following:
 - 1. Installation of new Cedar Shake Shingle Roofing.
 - 2. **For bidding purposes**, the Contractor will provide a price per square foot based on the following criteria:
 - a. Certi-Sawn Tapersawn 24"x 5/8" Number 1 Grade Red Cedar Shakes
 - b. 7 1/2" exposure (triple coverage)
 - c. 30 lb. felt interlay
- B. Related Work Described Elsewhere
 - 1. Rough Carpentry - Section 06100
 - 2. Metal Flashing and Trim - Section 07620
 - 3. Gutters and Downspouts – Section 07631
 - 4. Manufactured Roof Specialties – Section 07710
 - 5. Sealants and Caulking – Section 07951

1.02 References

- A. RCSHSB: Red Cedar Shingle and Handsplit Shake Bureau.
- B. ASTM: American Society for Testing and Materials.
- C. UL: Underwriters Laboratories.

1.03 Submittals

- A. Submittals Package: Submit the product data, samples, and quality control submittals specified below at the same time as a package.
- B. Product Data: Catalog sheets, specifications, and installation instructions for each material specified, except for nails.
- C. Samples:
 - 1. Shingles or Shakes: One bundle each type specified.
 - 2. Nails: 3, each type.
 - 3. Concealed Flashing: 6 inch square piece.

- D. Quality Control Submittals:
 - 1. Applicators Qualifications: Certification that the crew chief or foreman and at least one other member of the roofing crew have installed at least 12 wood shake or shingle roof systems and are thoroughly familiar with all aspects of the installation.

1.04 Quality Assurance

- A. Applicator's Qualifications: The crew chief or foreman and at least one other member of the roofing crew shall have previously installed at least 12 wood shake or shingle roof systems and shall be thoroughly familiar with all aspects of the installation.
- B. Fire Hazard Classification: The cedar shingles or shakes shall have an Underwriters Laboratories Class C External Fire Resistance Rating.
 - 1. All shingle or shake bundles shall bear the UL fire resistance label.
- C. Material Certification: All shingle or shake bundles shall bear the Red Cedar Shingle and Handsplit Shake Bureau label.
- D. Pre-Roofing Conference: Before the roofing Work is scheduled to commence, a conference will be called by the County Representative at the site for the purpose of reviewing the Drawings and the Specifications and discussing requirements for the Work. The conference shall be attended by the Contractor, and the roofing applicator.

1.05 Product Handling

- A. Deliver materials to the site in the manufacturer's labeled unopened containers.
- B. Store materials in a dry, well ventilated place protected from the weather.

1.06 Job Conditions

- A. Do not install underlayment or shingles on wet surfaces.
- B. Do not perform the Work of this Section unless the County Representative is present or unless he directs that the Work be performed during his absence.
- C. 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.
 - 2. Limit the removal of existing materials to areas that can be completely re-roofed or temporarily protected within the same day.

PART 2 PRODUCTS

2.01 Materials

- A. Shingles and Shakes: UL Classified, Number. 1 blue (Certi) label grade western red cedar shingles certified by the Red Cedar Shingle and Handsplit Shake Bureau.
 - 1. 24 inches x 5/8 inch Tapersawn
- B. Starter Course: 15 inch long starter course shingle.
- C. Felt Underlayment: No. 30 asphalt saturated felt, ASTM D 226.
- D. Concealed Flashing: Self adhering, self sealing, rubberized asphalt sheet membrane with manufacturer's primer for masonry surfaces. Acceptable product; "Bituthene Ice and Water Shield" and "Bituthene Ice and Water Shield Primer" as manufactured by W.R. Grace Co, 62 Whittemore Ave, Cambridge, MA 02140 or equal.
- E. Nails For Shingles and Shakes:
 - 1. 18 and 24 inch shakes: 6d 304 grade Stainless Steel nails.
 - 2. Hips and Ridges: 8d 304 grade Stainless Steel nails.

PART 3 EXECUTION

3.01 Inspection

- A. Do not proceed with application of shingles and shakes until all surfaces are dry, free of all debris and protruding nails, and properly supported for shingle nailing and application.

3.02 ROOF INSTALLATION

- A. Installing Concealed Flashings:
 - 1. Install all copper flashing as specified in Section 07620. Copper flashings shall include the following:
 - a. Drip edge
 - b. Open valley flashing
 - c. Step flashing and base flashing at walls and chimneys
 - d. Vent pipe flashing
 - 2. Eaves: Unless shown otherwise directed by the County, extend the flashing from the roof edge to a line a minimum of 2 ft beyond the interior face of the building wall.

3. Valleys, Hips and Ridges: Install the flashing centered on the valley, hip and ridge so that the flashing sheet extends a minimum of 18 inches on each side of the center line.
4. Chimneys, Intersecting Walls, and Curbs: Install 18 inch wide concealed flashing. Extend the flashing one ft onto the roof surface and 6 inches up the vertical surface.

B. Installing Shingles:

1. Install one ply of 36" wide "Ice and Watershield" Eave Protection, then 36" 15lb felt underlayment over the entire surface to be shingled. Lap edges a minimum of 2 inches and ends a minimum of 6 inches.
2. Start shingles at eaves with a starter course so that the first course of shingles are doubled. Set the first and starter course of shingles so that they project beyond the metal drip edge one inch.
3. Space shingles 1/4 to 3/8 inch apart from adjacent shingle.
4. Stagger joints in courses so that no joints in any three adjacent courses are in alignment.
5. Shingle Weather Exposure:
 - a. 16 inch shingle: 5 inch exposure.
 - b. 18 inch shingle: 5-1/2 inch exposure.
 - c. 24 inch shingle: 7-1/2 inch exposure.
6. Hip and Ridge Shingles:
 - a. Start shingles at hips and ridges with a starter course.
 - b. Use shingles of uniform width from 3 inches to 5 inches wide.
 - c. Miter cut the shingles so that they can be installed with an alternate overlap between courses.
7. Valleys:
 - a. Lap shingles over the copper valley flashing 7 inches. Lay the shingles so that the exposed portion of the valley at the top is 5 inches wide on each side of the valley center line and increases in width 1/8 inch per ft toward the eaves.
 - b. Do not break joints into the valleys or lay shingles with the grain parallel with the center line of valley.
8. Base Flashing:
 - a. Interlace shingles with the base flashing. Lap the shingles a minimum of 5 inches over the base flashing.
9. Nailing Shingles:
 - a. Secure each shingle with two nails. Place each nail not more than 3/4 inch from the side of the shingle and not more than 2 inches above the butt line of the next course.
 - b. Drive nails flush without driving the nailheads into the shingles or crushing the wood.

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3.03 WALL INSTALLATION

- A. Installing Shingles:
1. Install one ply of felt underlayment over the entire surface to be shingled. Lay edges a minimum of 2 inches and ends a minimum of 6 inches.
 2. Start shingles with a starter course so that the first course at the bottom of the wall is doubled.
 3. Butt shingles together so joints are closed.
 4. Stagger joints in courses so that no joints in any three adjacent courses are in alignment.
 5. Shingle Weather Exposure:
 - a. 16 inch shingles: 7-1/2 inch exposure.
 - b. 18 inch shingles: 8-1/2 inch exposure.
 - c. 24 inch shingles: 11-1/2 inch exposure.
 6. Inside and Outside Corners:
 - a. Miter cut the shingles so they can be installed with an alternate overlap between courses.
 7. Nailing Shingles:
 - a. Secure each shingle with two nails. Place each nail not more than 3/4 inch from the side of the shingle and not more than 2 inches above the butt line of the next course.
 - b. Drive nails flush without driving the nailheads into the shingles or crushing the wood.

3.04 CLEANING

- A. Clean debris from roofs, gutters, downspouts, and drainage systems. Test drainage system for proper operation.

END OF SECTION

SECTION 07510
BUILT-UP BITUMINOUS ROOFING SYSTEM

PART 1 - GENERAL

1.01 Description of Work

A. This Section includes the following:

1. Built-up Bituminous Roofing System.

B. Related Work Described Elsewhere:

1. Rough Carpentry - Section 06100
2. Vapor Barriers - Section 07190
3. Roof and Deck Insulation - Section 07240
4. Traffic Topping - Section 07570
5. Metal Flashing and Trim - Section 07240 - 3
6. Gutters and Down spouts - Section 07631
7. Gravel Stops - Section 07660
8. Sealants and Caulking - Section 07951
9. Roof Drains - Section 15422

1.02 Definitions

- A. Roofing Terminology: Refer to ASTM D 1079 for definitions of terms related to roofing work not otherwise defined in this Section.
- B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop applied roofing asphalt and 75 centipoise for mechanical spreader applied roofing asphalt within a range of plus or minus 25 °F(14 °C) measured at the mop cart or mechanical spreader immediately before application.

1.03 Performance Requirements

- A. General: Install a watertight built-up roofing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.
1. Factory Mutual: Class 1A-90
 2. Underwriters Laboratory (UL) Class A Rating

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1.04 Submittals

- A. Product Data: For each type of roofing product specified include data substantiating that materials comply with requirements.
- B. Manufacturer's Material Safety Data Sheets (MSDS): Submit with product data a copy of the MSDS.
- C. Shop Drawings: Include plans, sections, details, and attachments to other work, for the following:
 - 1. Base flashing, cants, and membrane terminations.
 - 2. Crickets, saddles, and tapered edge strips.
- D. Samples for Verification: Submit samples of the following products in the sizes and numbers indicated:
 - 1. 12-by-12-inch (300-by-300-mm) square of glass fiber ply sheets.
 - 2. 12-by-12-inch (300-by-300-mm) square of SBS Cap Sheet ply sheets.
 - 3. 12-by-12-inch (300-by-300-mm) square of flashing.
 - 4. Sample of asphalt.
 - 5. Six (6) inch cants.
- E. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, and/or licensed by manufacturer to install specified roofing system and is eligible to receive the specified roofing manufacturer's warranty.
- F. Manufacturer Certificates: Signed by roofing system manufacturer certifying that the roofing system complies with the specified "Performance Requirements".
- G. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of components of roofing system with requirements based on comprehensive testing of current product compositions.
- I. Maintenance Data: For roofing system to include in the maintenance manuals specified in Division 1.
- J. Warranty: Sample copy of standard roofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.

- K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.05 Quality Assurance

- A. Installer Qualifications: Engage an experienced installer to perform the work of this Section who has specialized in installing roofing similar to that required for this Project; who is approved, authorized, or licensed by the roofing system manufacturer to install manufacturer's product; and, who is eligible to receive the standard roofing manufacturer's warranty of the specified length.
- B. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method indicated below by UL, FM, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; complying with ASTM E 108, for application and slopes indicated.
- C. Preinstallation Conference: Before installing roofing system, conduct conference at Project site. Notify participants at least five (5) working days before conference.
 - 1. Meet with Owner; Architect; Owner's insurer, if applicable; testing and inspecting agency representative; roofing installer; roofing system manufacturer's representative and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review loading limitations of deck during and after roofing.
 - 4. Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
 - 5. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.

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6. Review temporary protection requirements for building and roofing system during and after installation.
7. Review roof maintenance and repair procedures after roofing installation.
8. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

1.06 Delivery, Storage and Handling

- A. Store roofing materials in a dry, warm, well-ventilated, weather tight location according to roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on end on pallets or other raised surfaces. Do not double-stack rolls.
 1. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.
- B. Do not leave unused felts and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 °F (10 °C).
- C. 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.

1.07 Project Conditions

- A. Do not apply roofing membrane during unsuitable weather (when ambient temperature is below 30 °F) unless approval is granted by manufacturer and Nassau County.
- B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is occurring.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.08 Warranty

- A. Roofing Manufacturer's Warranty: Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in the roof membrane and base flashing resulting from defects in materials or workmanship for the following warranty period:

1. Warranty Period: 20 years.

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- B. Roofing Installer's Warranty: Submit a Roofing Installer's Warranty, on warranty form at end of this Section, signed by Installer, covering all roofing system components, including built-up roofing, base flashing, roofing insulation, fasteners, vapor barriers, etc., for the following warranty period:

1. Warranty Period: 2 years from date of completion

PART 2 - PRODUCTS

2.01 Manufacturers

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Built-up Asphalt Roofing:
- a. Johns Mansville Co.
 - b. Garland Company, Inc.
 - c. GAF Building Materials Corp.

2.02 Built-Up Roofing Plies

- A. Ply Felt: Asphalt-impregnated, glass-fiber felt, complying with ASTM D 2178, Type VI.

2.03 Flashing Material

- A. Backer Sheet: Asphalt-impregnated, glass-fiber felt, complying with ASTM D 2178, Type VI.
- B. Flashing Sheet: SBS-modified asphalt sheet, granular surfaced; suitable for application method specified; manufacturer's standard thickness and weight; of granule color and reinforced as follows:
- 1. Granule Color: To be selected by Owner from standard colors produced by the Manufacturer.
 - 2. Reinforcing: Polyester
 - 3. Min. Thickness: 4.5 mm (approx 3/16")

2.04 Asphalt Materials

- A. Asphalt Primer ASTM D 41
- B. Roofing Asphalt ASTM D 312, Type III or Type IV, as recommended by built-up roofing system manufacturer.
- C. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

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- D. Mastic Sealant Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.
- 2.05 Accessories
- A. Fasteners: Factory –coated steel fasteners and metal or metal with plastic plates complying with corrosion resistance provisions of Fm 4470; designed for fastening base sheets and base flashing and for back nailing ply felts to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.
- B. Wood Nailer Strips: Furnish wood nailer strips complying with requirements of Section 06100, “Rough Carpentry”.
- C. Cants: Cellulosic – fiberboard, complying with ASTM C 208, Type 2

3 – EXECUTION PART

3.01 Examination

- A. Examine substrates, areas, and conditions under which roofing will be applied, with Roofing System Manufacturer present, for compliance with requirements including **1/8”per foot pitch to drains**.
- B. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.
- C. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thickness of insulation required. At round openings, seal the edges of the insulation with a trowel coat of roofing cement.

3.02 Preparation

- 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. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.03 General Installation Requirements

- A. Install built-up roofing system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-Up Roofing".
- B. Install roofing system according to applicable specification plates of NRCA'S "The NRCA Roofing and Waterproofing Manual."
- C. Start installation of built-up roofing system in presence of roofing system manufacturer's technical personnel.
- D. Cant Strips; Install and secure preformed forty-five (45) degree cant strips at junctures of built-up roofing membrane system with vertical surfaces or angle changes greater than forty-five (45) degrees.
- E. Cooperate with inspecting and testing agencies engaged or required to perform services for installing built-up roofing system.

PART 2 - F. Night Seals - Coordinate installing roofing system components so insulation and roofing plies are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast. All completed roofing shall be made watertight at the end of each days work. Areas requiring night seals may include but are not limited to All Penetrations, Entire Perimeter, and Tie in between new work and existing membrane or deck.

- 1. Provide cutoffs at end of each workday to cover exposed ply sheets and insulation with a course of coated felt with joints and edges sealed.
- 2. Complete terminations and base flashing and provide temporary seals to prevent water from entering completed sections of roofing system.
- 3. Remove and discard temporary seals before beginning work on adjoining roofing.

PART 3 - 4. Failure to properly terminate and make watertight new work may result in rejection and tear off of new work regardless of the weather conditions during the unprotected period.

- F. Asphalt Heating: Heat roofing asphalt and apply within plus or minus 25 °F (14 °C) of equiviscous temperature, unless otherwise required by roofing system manufacturer. Do not raise roofing asphalt temperature above the equiviscous temperature range more than one (1) hour before time of application. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating. Do not heat roofing asphalt within 25 °F (14 °C) of flash point. Discard roofing asphalt maintained at a temperature exceeding 500 °F (260 °C) for more than four (4) hours.

1. Aggregate Surfacing: Limit temperature of asphalt flood coat to the minimum required for proper embedment of aggregate and the maximum that will permit retention of required coating weight based on slope of surface.
2. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction. If mopping is applied directly to substrate, tape substrate joints.
3. Maintaining the odor of heated asphalt to an absolute minimum is of utmost importance for this project, the Contractor will add an odor reducing compound such as "DeScent" by ArrMaz Custom Chemicals (or equal) to the kettle as instructed by manufacturer.

3.04 Built-Up Roofing Installation

- A. Install ply felts according to roofing system manufacturer's written instructions, starting at low point of roofing system. Align ply felts without stretching. Shingle side laps of ply felts uniformly to achieve required number of plies throughout. Shingle in direction to shed water. Extend ply felts over and terminate beyond cants.
 1. Install 3 ply felts.
 2. Application: Embed each ply in a solid mopping of hot roofing asphalt applied at rate required by roofing system manufacturer, to form a uniform membrane without ply felts touching each other.
- B. Install lapped SBS Cap Sheet according to roofing system manufacturer's written instructions, starting at low point of roofing system. Offset laps from laps of preceding ply felts and align lap sheet without stretching. Lap in direction to shed water. Extend lap sheet over and terminate beyond cants.
 1. Application: Embed cap sheets in a solid mopping of hot roofing asphalt applied at rate required by roofing system manufacturer.
 2. Broadcast cap flashing granules into hot asphalt at seams to provide a uniform roof.

3.05 Flashing and Stripping Installation

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 2. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt. Apply hot roofing asphalt to back of flashing sheet if recommended by roofing system manufacturer.

- B. Extend base flashing up walls or parapets a minimum of eight (8) inches (200 mm) above roof membrane (or as high as necessary for metal counter flashing to cover it) and eight (8) inches (200 mm) onto field of roof membrane.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
 - 1. Built-up Stripping: Install stripping of not less than 2 plies of roof membrane felt, setting each ply in a continuous coating of asphalt roofing cement or in a solid mopping of hot roofing asphalt, with joints coated with 2 part MBR, extended onto roof membrane eight (8) inches (200 mm) and six (6) inches (150 mm), respectively.
- D. Roof Drains: Set 30-by-30-inch (760-by-760-mm) lead pan metal flashing in bed of asphalt roofing cement on completed built-up roofing membrane. Cover metal flashing with stripping, extending a minimum of 4 inches (100 mm) beyond edge of lead flashing onto field of roof membrane. Clamp roof membrane, lead flashing, and stripping into roof-drain clamping ring. Stripping Material: Install not less than 2 plies of roof membrane felt, then SBS Cap Sheet, each set in a continuous coating of asphalt roofing cement or in a solid mopping of hot roofing asphalt.
- E. **Flood Testing:** After completion of roofing work, all drains shall be plugged and roofs flooded with a minimum of 1" of water above high points. Water shall remain for a minimum of 3 hours. If leaks occur, contractor shall do all necessary work to correct them and flood test repeated until contractor can show that no leaks occur.

3.06 Field Quality Control

- A. Correct deficiencies in or remove and replace built-up roofing that inspections and test reports indicate does not comply with requirements.
- B. Additional testing, at Contractor's expense, may be performed to determine that
- C. Test Cuts: Before flood coating and surfacing built-up roofing system, test specimens will be removed to evaluate problems observed during quality assurance inspections of roof system as follows:
 - 1. Approximate quantities of components within roof membrane will be determined according to ASTM D 3617.
 - 2. Test specimens will be examined for interply voids according to ASTM D 3617 and to comply with the criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

D. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to County.

1. Notify owner and County Project Manager forty-eight (48) hours in advance of the date and time of inspection.

3.07 Protecting and Cleaning

- A. Protect built-up roofing system from damage and wear during and after completion of all work. When remaining activities will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report to the County.
- B. Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair base flashing to a condition free of damage and deterioration at the time of completion and according to warranty requirements.
- C. Clean over spray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

1.08 Roofing Installer's Warranty

- A. The roofing system Installer will provide a written warranty covering a one (1) year period from the completion of the work
- B. The language and form of the warranty will be as follows:

(see next page for warranty form and language)

Owner: Nassau County
Address: (building address)
Warranty Period: (start date) to (end date)

WHEREAS, Roofing Installer has contracted either directly with Owner or indirectly as a subcontractor to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW Therefore, Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning
 - b. fire
 - c. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decompositions;
 - d. faulty construction of parapet walls, copings, chimneys, skylights, vents, paraphernalia supports, and penetrations of the work;
 - e. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes. Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof has been paid by Owner or by another responsible party so designated.
3. The Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void, unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basis, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. The Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____ .

(NAME OF CONTRACTOR)

(Authorized Signature) (Print Name) (Print Title)

(Notary Public)

[END OF SECTION]

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SECTION 07520
SBS MODIFIED BITUMEN ROOFING SYSTEM

PART 1 - GENERAL

1.01 Description of Work

A. This Section includes the following:

1. SBS Modified Bitumen Roofing System

B. Related Work Described Elsewhere:

1. Rough Carpentry - Section 06100
2. Vapor Barriers - Section 07190
3. Roof and Deck Insulation - Section 07240
4. Traffic Topping - Section 07570
5. Metal Flashing and Trim - Section 07620
6. Gutters and Downspouts - Section 07631
7. Manufactured Roof Specialties - Section 07710
8. Sealants and Caulking - Section 07951
9. Roof Drains - Section 15422

1.02 Performance Requirements

A. General: Install a watertight sheet membrane roofing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.

1. FM/UL: Class A

1.03 Submittals

A. Product Data: For each type of roofing product specified include data substantiating that materials comply with requirements.

B. Manufacturer's Material Safety Data Sheets (MSDS): Submit with product data a copy of the MSDS.

C. Shop Drawings: Indicate setting plan for flat and tapered insulation, joint or termination detail conditions, and conditions of interface with other materials.

- D. Samples: Submit three (3) 4" x 4" squares of sheet membrane.
- E. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, and/or licensed by manufacturer to install specified roofing system and is eligible to receive the specified roofing manufacturer's warranty.
- F. Manufacturer Certificates: Signed by roofing system manufacturer certifying that the roofing system complies with the specified "Performance Requirements".
- G. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of components of roofing system with requirements based on comprehensive testing of current product compositions.
- I. Maintenance Data: For roofing system to include in the maintenance manuals specified in Division 1.
- J. Warranty: Sample copy of standard roofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.
- K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.04 Quality Assurance

- A. Installer Qualifications: Engage an experienced installer to perform the work of this Section who has specialized in installing roofing similar to that required for this Project; who is approved, authorized, or licensed by the roofing system manufacturer to install manufacturer's product; and, who is eligible to receive the standard roofing manufacturer's warranty of the specified length.
- B. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method indicated below by UL, FM, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; complying with ASTM D6164, for application and slopes indicated.

- C. Preliminary Roofing Conference: Before installing roofing system, conduct conference at Project site. Notify participants at least five (5) working days before conference.
1. Meet with County representatives; Architect; if applicable; testing and inspecting agency representative; roofing installer; roofing system manufacturer's representative and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review loading limitations of deck during and after roofing.
 4. Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
 5. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.
 6. Review temporary protection requirements for building and roofing system during and after installation.
 7. Review roof maintenance and repair procedures after roofing installation.
 8. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

1.05 Delivery, Storage and Handling

- A. Store roofing materials in a dry, warm, well-ventilated, weather tight location according to roofing system manufacturer's written instructions.
- B. Handle and store roofing materials and place equipment in a manner to avoid any damage to roof deck or structural supporting members.
- C. Do not leave unused membrane and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50° F (10° C).

1.06 Project Conditions

- A. Do not apply roofing membrane during inclement weather or when ambient temperatures are below 45° F (7.2° C) or above 85° F (29.4° C).
- B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is occurring.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day.

1.07 Warranty

- A. Roofing Manufacturer's Warranty: Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in the roof membrane and base flashing resulting from defects in materials or workmanship for the following warranty period:
 - 1. Warranty Period: Twenty (20) years.
- B. Roofing Installer's Warranty: Submit a Roofing Installer's Warranty, on warranty form at end of this Section, signed by Installer, covering all roofing system components, including membrane roofing, base flashing, roofing insulation, fasteners, vapor barriers, etc., for the following warranty period:
 - 1. Warranty Period: Two (2) years from date of completion.

PART 2 – PRODUCTS

2.01 Manufacturers

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Cold applied modified bitumen roofing system incorporating a fiberglass mat with a blend of rubber and asphalt:
 - a. Johns Manville Roofing Systems
 - b. CertainTeed Roofing Systems
 - c. Firestone Building Products Co. Inc.

2.02 Thermal Protective Layer

- A. Gypsum Board: ASTM C 1177, Heavy duty coated glass-mat facer, water-resistant gypsum substrate for adhered roof applications, 1/2 inch (13 mm) thick. Basis of design: DEXcell FA Glass Mat Roof Board or Dens Deck Prime Roof Board
- B. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs of compressive strength. Basis of Design: ProtectoR HD
Thickness: 1/2 inch (13 mm)
R-value: 2.5
- C. Thermal Protective Layer Securement
 - 1. Mechanical
 - a. #12 Phillips or hex head fasteners with an engineered thread and corrosion resistant coating, exceeding FM Global Approved Standard #4470 corrosion requirements. Provide with either a #3 Phillips head or a 1/4" hex head, a point designed for quick installation and a 3" round, galvalume metal plate.

2.03 Membrane Layer

- A. SBS Base Membrane:
Roofing Membrane Sheet: ASTM D 6163, Grade S, Type I, glass-fiber-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified. Basis of Design: DynaBase.
- 1. Typical Physical Properties:
 - a. Thickness 91 mils (2.3 mm)
 - b. Tensile Strength
 - Machine Direction 100 lbs. force/in width
 - Cross Machine Direction 80 lbs. force/in width
 - c. Elongation at Peak Load at 73.4°F (23°C)
 - Machine Direction 4.0 %
 - Cross Machine Direction 4.0 %
 - d. Peak Load at 73.4°F (23°C)
 - Machine Direction 65 lbs./in.
 - Cross Machine Direction 50 lbs./in.
 - e. Low Temperature Flexibility -30° F (-34° C)

- f. Dimensional Stability
 - Machine Direction 0.10 %
 - Cross Machine Direction 0.10 %

2.03 Membrane Layer (cont.)

B. SBS Cap:

Roofing Membrane Cap Sheet: ASTM D 6162, Grade G, Type I, composite polyester- and glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified. Basis of Design: DynaKap FR T1

2. Typical Physical Properties:

- a. Thickness 157 mils (4 mm)
- b. Tensile Strength
 - Machine Direction 165 lbs. force/in width
 - Cross Machine Direction 160 lbs. force/in width
- c. Elongation at Peak Load at 73.4°F (23°C)
 - Machine Direction 6.0 %
 - Cross Machine Direction 6.0 %
- d. Peak Load at 73.4°F (23°C)
 - Machine Direction 120 lbs./in.
 - Cross Machine Direction 100 lbs./in.
- e. Low Temperature Flexibility -15° F (-26° C)
- f. Dimensional Stability
 - Machine Direction 0.20 %
 - Cross Machine Direction 0.20 %

C. Membrane Securement:

Cold-Applied Adhesive: ASTM D3019, Type III, Grade 2. asphalt-based, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with membrane applications. Basis of Design: MBR Cold Application Adhesive.

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2.04 Flashing

- A. Backer Sheet: ASTM D 6163, Grade S, Type I, glass-fiber-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified. Basis of Design: DynaBase
- B. Flashing Sheet: ASTM D 6221, Grade G, Type I, composite polyester- and glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified. Basis of Design: DynaFlex
- C. Liquid Applied Flashing: A liquid and fabric reinforced flashing system created with a stitch bonded polyester scrim and a two-component, moisture cured, elastomeric, liquid applied flashing material, consisting of an asphalt extended urethane base material and an activator. Basis of Design: PermaFlash System
- D. Cold-Applied Flashing Adhesive: Roofing system manufacturer's asphalt-based, one-part, asphalt-based, trowel-grade mastic, cold-applied adhesive specially formulated for compatibility and use with flashing applications. Basis of Design: MBR Utility Cement.
- E. Counter flashing: Metal, as specified in Section 07620.
- F. Prefabricated Roof Specialties: As specified in Section 07710.

PART 3 - EXECUTION

3.01 Examination

- A. Examine substrates, areas, and conditions under which roofing will be applied, with Roofing System Manufacturer present, for compliance with requirements.
- B. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.
- C. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck, roof penetrations, and terminations and match the thickness of insulation required.

3.02 Recover Preparation

- A. Tear out all base flashings, counter-flashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

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- C. Disable existing roof membrane by cutting a minimum 5 foot by 5 foot grid pattern.
- D. Remove and replace wet, deteriorated or damaged roof insulation and decking as identified in the moisture survey or as directed by the County representative.
- E. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations. Install decking to match existing as directed by the County representative.
- F. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- G. Immediately remove all debris from roof surface. Demolished roof system shall not be stored on the roof surface.

3.03 Installing Thermal Protective Layer

- A. Start at the low edge of the roof, mechanically attach using fasteners approved for the specific project.
 - 1. Install boards with long joints continuous.
 - 2. Stagger short joints.
 - 3. Butt joints tightly.
 - a. "Occasional" joint widths of 1/8" will be allowed. Fill any and all widths greater than 1/8" with scrap thermal protective layer to achieve consistent surface.
- B. Fasten at density required to resist expected uplift pressures.
 - 1. Increase fastener density at perimeters and corners in accordance with FM Global Property Loss Prevention Data Sheet 1-29.
 - 2. Install fasteners no closer than 6 inches to the board edges.
 - 3. Size fasteners for adequate penetration.
- C. Keep insulation dry at all times. Discard insulation that contains moisture.
 - 1. Install only as much insulation as can be covered with roofing membrane the same day.

- D. Repair any defects or installation errors prior to the next phase of the roof system installation.
- 3.04 Roofing Membrane Installation
- A. Membrane Installation Sequencing:
 - 1. Base ply SBS base sheet, fiberglass reinforced.
 - 2. Cap ply SBS granulated cap sheet, composite reinforced.
 - 3. Securement:
 - a. Cold Application Adhesive applied by squeegee or industrial spray equipment designed for the roofing environment.
 - B. Substrate:
 - 1. Verify that all requirements for the examination and preparation have been met before commencing installation.
 - C. Placing Membrane Layers:
 - 1. Apply ½ width sheet.
 - 2. Apply all subsequent membrane sheets full width.
 - a. End Laps: 6' minimum
 - 1. Stagger end laps a minimum of 3 feet
 - b. Side Laps: 4" minimum
 - D. Securing Membrane:
 - 1. Install each layer so that it is firmly and uniformly set in cold adhesive, without voids.
 - 2. Adhere modified bituminous roofing membrane sheet to substrate in cold-applied adhesive according to roofing system manufacturer's instruction.
 - E. Sealed Laps:
 - 1. Equipment:
 - a. Accepted hot air welding with bitumat attachment or torch installation methods with single flame torch.

2. Fire Prevention:
 - a. Fuel torches from acceptable propane tanks that are fueled and maintained by approved and licensed suppliers of industrial gasses.
 - b. Observe all fire regulations and industry precautions. Provide minimum one-hour fire watch at the end of each working session. Fire watch personnel shall not be assigned to other tasks during the one-hour period.
 - c. Provide CERTA training for all torch operators. Have training certificates available for inspection at any time during torch operations.
3. Side Lap Procedure: Apply heat to the surface lap.
 - a. Keep the heat/flame directed at the adhered ply and in front of the lap.
 - b. Heat/torch across the full width of the lap area
 - c. As the surface is heated, it will develop a sheen. The generation of smoke is an indication that the material is being overheated.
 - d. Modified asphalt compound must bleed out past the edge of the sheet by a minimum of ¼”.
4. When compound is prepared for adhesion, roll into position and ensure firm and uniform bearing.
5. Repeat the operation with subsequent laps, maintaining proper side laps and end laps.
6. End Lap Procedure: Preparation of the end lap of the cap membrane layer requires scuffing away all loose granules.
 - a. Heat and embed all remaining granules.
7. Apply heat to the roll being seamed while making sure both have a good compound flow to adhere the two surfaces.
8. Check end laps for proper adhesion.

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3.05 Flashing and Accessories

- A. Inspect walls, curb heights, counter-flashings, etc., and check for conformance with minimum base flashing height of eight inches (8").
- B. Bring non-conforming areas to the attention of the County representative.
- C. Prepare and prime substrate surfaces pursuant to manufacturer's instructions.
 - 1. Abrade and grind surfaces and clean metal surfaces to bare metal when recommended by the manufacturer.
 - 2. Follow manufacturer recommendations for required temperature of substrate and materials, and for filling of voids.
- D. Prime all masonry, metal, or concrete surfaces from the top of the roof membrane to the termination of the flashing level with asphalt primer at the rate of one (1) gallon per 100 square feet or as recommended by the manufacturer.
- E. Allow the primer to dry thoroughly.
- F. Ensure that bonding surfaces to which the seal or flashing are to be placed are clean and free of moisture, dirt, grease, oil, loose material, foreign material, and debris.
- G. Provide seals or flashing at penetrations of the roof membrane as required for a watertight roof system, and as indicated on the drawings, and as approved by the roof system manufacturer for inclusion in the roofing warranty.
- H. Install two ply base flashing system using specified modified bitumen sheets at all intersections formed by changes of plane, and whatever curbed roof openings, wall, parapets, or other structure joint penetrates the roof.
- I. Fluid Applied Flashing System: Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 - 2. Backer Sheet Application: Mechanically fasten backer sheet to walls or parapets.
 - 3. Backer Sheet Application: Install backer sheet and adhere to substrate in a solid mopping of hot roofing asphalt.
 - 4. Backer Sheet Application: Install backer sheet and adhere to substrate in approved adhesive applied at rate required by roofing system manufacturer.
 - 5. Backer Sheet Application: Install backer sheet and heat weld to substrate as required by roofing system manufacturer.
 - 6. Backer Sheet Application: Install backer sheet and self adhere to substrate as required by roofing system manufacturer.

7. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt. Apply hot roofing asphalt to back of flashing sheet if recommended by roofing system manufacturer.
 8. Flashing Sheet Application: Adhere flashing sheet to substrate in approved adhesive applied at rate required by roofing system manufacturer.
 9. Flashing Sheet Application: Adhere flashing sheet to substrate in approved asphalt roofing cement; apply cement at rate required by roofing system manufacturer.
 10. Flashing Sheet Application: Heat weld flashing sheet to substrate as required by roofing system manufacturer.
- G. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.
- H. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
1. Seal top termination of base flashing with a strip of glass-fiber fabric set in MBR Flashing cement.
- I. Roof Drains: Flash drain using liquid applied flashing (PermaFlash) system. Clamp roofing membrane, flashing, and stripping into roof-drain clamping ring.
1. Install stripping according to roofing system manufacturer's written instructions.
- J. Flash all penetrations using liquid applied flashing (PermaFlash) system.
- K. Proceed with installation only after unsatisfactory conditions have been corrected.
- J. Walkway Pads – Splash Blocks – Protection Pads:
1. Set the pads in a solid bed of plastic cement compatible with the cap sheet material.
 2. Leave adequate space between pads so that positive drainage is not affected from the installation.

3.06 Field Quality Control

- A. After all roofing system Work is completed, provide an inspection by the roofing system manufacturer's representative. Representative shall be employed expressly as a technical employee and not concurrently function in a sales role. Provide, via the representative, documentation verifying that the roofing system has been installed in accordance to the Specifications.

3.07 Protecting and Cleaning

- A. Keep newly installed roofing membrane clean and new in appearance under the assumption that all areas of roofing are aesthetically essential. Contractor may be directed to remedy - and if no remedy is available – replace, newly roofed areas that are not maintained as such during the balance of the installation.

- B. Restore all other building surfaces and areas affected by roofing application to the same condition of aforementioned on day of job start.

3.07 Protecting and Cleaning (cont.)

- C. Remove all debris from roof and staging areas.

3.08 Roofing Installer's Warranty

- A. The roofing system Installer will provide a written warranty covering a Two (2) year period from the completion of the work.
- B. The language and form of the warranty will be as follows:
(see next page for warranty form and language)

[End of Section]

Owner: Nassau County
Address: (building address)

Warranty Period: (start date) to (end date)

WHEREAS Roofing Installer has contracted either directly with Owner or indirectly as a subcontractor to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period;

NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning
 - b. fire
 - c. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decompositions;
 - d. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and penetrations of the work;
 - e. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof has been paid by Owner or by another responsible party so designated.
3. The Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

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4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void, unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basis, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. The Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this ____ day of _____, _____.

(NAME OF CONTRACTOR)

(Authorized Signature)
(Print Name)
(Print Title)

(Notary Public)

SECTION 75216
STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE
ROOFING – HIGH WIND APPLICATION

PART 2 - GENERAL

2.1 SECTION INCLUDES

- A. FM RoofNav Requirements for Steel and Concrete Decks
- B. SBS-modified bituminous membrane roofing.
- C. Cover board.
- D. Roof insulation.
- E. Vapor retarder.
- F. Substrate board.

2.2 REFERENCES

- A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:
 - 1. ASTM D 1079 “Standard Terminology Relating to Roofing and Waterproofing.”
 - 2. Glossary of NRCA’s “The NRCA Roofing and Waterproofing Manual.”
 - 3. Roof Consultants Institute “Glossary of Building Envelope Terms.”
- B. Sheet Metal Terminology and Techniques: SMACNA “Architectural Sheet Metal Manual.”
- C. Hot Roofing Asphalt: Roofing asphalt heated to temperature recommended by roofing manufacturer to flux modified roofing membrane, measured at the mop cart or mechanical spreader immediately before application.

2.3 DESIGN CRITERIA

- A. General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

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- C. Installer shall comply with current code requirements based on authority having jurisdiction.
- D. Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.
- E. FMG Listing: Roofing membrane, base flashings, and component materials shall comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
 - 1. For Steel Decks with high wind requirements:
 - a. Roofing system shall comply with RoofNav #: 313194-144211-0 or 374893-373727-0
 - 2. For Concrete Decks with high wind requirements:
 - a. Roofing system shall comply with RoofNav #: 463098-463091-0
- F. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

2.4 SUBMITTALS

- A. Product Data: Manufacturer's data sheets for each product to be provided.
- B. Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:
 - 1. Base flashings and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Crickets, saddles, and tapered edge strips, including slopes.
 - 4. Insulation fastening and adhesive patterns.
- C. Verification Samples: Provide for each product specified.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- E. Maintenance Data: Refer to Johns Manville's latest published documents on www.JM.com.

- F. Guarantees: Provide manufacturer's current guarantee specimen.
- G. Prior to roofing system installation, roofing sub-contractor shall provide a copy of the Guarantee Application Confirmation document issued by Johns Manville Roofing Systems indicating that the project has been reviewed for eligibility to receive the specified guarantee and registered.

2.5 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's guarantee.
- B. Manufacturer Qualifications: Qualified manufacturer that has **UL listing** for roofing system identical to that used for this Project.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 329.
- D. Test Reports:
 - 1. Roof drain and leader test or submit plumber's verification.
- E. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system shall be labeled by the single source roofing manufacturer issuing the guarantee.
- F. Provide evidence of CERTA training for any installer of torch-applied modified bitumen membrane. Copies of certifications are required prior to award and shall be maintained on the jobsite for inspection at any time.

2.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

2.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

2.8 GUARANTEE

- A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.
 - 1. Single-source special guarantee includes roofing plies, base flashings, liquid applied flashing, roofing membrane accessories, roofing membrane, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
 - 2. Guarantee Period: 20 years from date of Substantial Completion.
 - 3. Contractor is required to list "INSERT FIRM NAME" as the Specifier/Consultant of record in the appropriate fields ("Specifier Account") when applying for the manufacturer's warranty.
- B. Installer's Guarantee: Submit roofing Installer's guarantee, signed by Installer, covering Work of this Section, including all components of roofing system, for the following guarantee period:
 - 1. Guarantee Period: Two years from date of Substantial Completion.
- C. Existing Guarantees: Guarantees on existing building elements should not be affected by scope of work.
 - 1. Installer is responsible for coordinating with building owner's representative to verify compliance.

PART 3 - PRODUCTS

3.1 BASE PLY AND CAP-SHEET MATERIALS

- A. Roofing Membrane Sheet: SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified.
 - 1. ASTM D 6163, Grade S, Type I, glass-fiber-reinforced, Basis of design: DynaBase
- B. Roofing Membrane Cap Sheet: SBS-modified asphalt sheet; granular surfaced; suitable for application method specified.

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1. ASTM D 6162, Grade G, Type I, composite polyester- and glass-fiber-reinforced, Basis of design: DynaKap FR T1 or DynaKap FR T1 CR G

3.2 FLASHING SHEET MATERIALS

- A. Backer Sheet: SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified.
 1. ASTM D 6163, Grade S, Type I, glass-fiber-reinforced, Basis of design: DynaBase
- B. Flashing Sheet: SBS-modified asphalt sheet; granular surfaced; suitable for application method specified.
 1. ASTM D 6162, Grade G, Type I, composite polyester- and glass-fiber-reinforced, Basis of design: DynaKap FR T1 or DynaKap FR T1 CR G
- C. Liquid Applied Flashing: A liquid and fabric reinforced flashing system created with a stitch bonded polyester scrim and a two-component, moisture cured, elastomeric, liquid applied flashing material, consisting of an asphalt extended urethane base material and an activator. Basis of design: PermaFlash System

3.3 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.
- B. Asphalt Primer: ASTM D 41. Basis of design: Asphalt Primer
- C. Cold-Applied Adhesive: ASTM D3019, Type III, Grade 2. asphalt-based, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with membrane applications. Basis of design: MBR Cold Application Adhesive
- D. Cold-Applied Flashing Adhesive: Roofing system manufacturer's asphalt-based, one-part, asphalt-based, trowel-grade mastic, cold-applied adhesive specially formulated for compatibility and use with flashing applications. Basis of design: MBR Utility Cement
- E. Mastic Sealant: As required by Johns Manville.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and provided by the roofing system manufacturer. Basis of design: UltraFast Fasteners and Plates
- G. Roofing Granules: Ceramic-coated roofing granules matching specified cap sheet, provided by roofing system manufacturer. Roofing Granules.

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- H. Coating: Acrylic elastomeric coating with unique bleed-blocking properties particularly well suited for coating over asphalt surfaces. Basis of design: JM CR Seam Coating
- I. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

3.4 WALKWAYS

- A. Walkway Pads: Mineral-granule-surfaced, reinforced modified asphalt composition, slip-resisting pads, manufactured as a traffic pad for foot traffic provided by roofing system manufacturer, with a pad size of 32-inch x 32-inch. Basis of design: DynaTred Walkway

3.5 COVER BOARD

- A. Gypsum Board: ASTM C 1177, Heavy duty coated glass-mat facer, water-resistant gypsum substrate for adhered roof applications, 1/2 inch (13 mm) thick. Basis of design: DEXcell FA Glass Mat Roof Board or Dens Deck Prime Roof Board

3.6 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), Basis of design: ENRGY 3
 - 1. Provide insulation package with minimum R Value: minimum required by applicable code.
 - 2. Provide insulation package with minimum thickness: insert thickness.
 - 3. Provide insulation package in multiple layers.
 - 4. Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch.
 - a. Determined in accordance with CAN/ULC S770 at 75°F (24°C)

3.7 TAPERED INSULATION

- A. Tapered Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated. Basis of design: Tapered ENRGY 3

3.8 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

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- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated. Basis of design: DiamondBack Pre-Cut Crickets, DiamondBack Pre-Cut Miters, or Tapered Fesco Edge Strip
- C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer. Basis of design: UltraFast Fasteners and Plates
- D. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate. Basis of design: JM Two-Part Urethane Insulation Adhesive (UIA)
- E. Insulation Cant Strips: ASTM C 728, perlite insulation board. Basis of design: FesCant Plus
- F. Wood Nailer Strips: Comply with requirements in Division 06 Section "Miscellaneous Rough Carpentry."

3.9 VAPOR RETARDER

- A. Self-Adhered SBS Vapor Retarder: ASTM D 4601, glass-fiber-reinforced, SBS-modified asphalt sheet; sand surfaced; suitable for application method specified. Basis of design: DynaGrip SD/SA.
- B. Self-Adhered SBS Vapor Retarder: Tri-laminate woven polyethylene, nonslip UV protected top surface; suitable for application method specified. Basis of design: JM Vapor Barrier SAR.
- C. Self-Adhered Primer: One-part penetrating primer solution to enhance the adhesion of self-adhering membranes. Basis of design: SA Primer Low VOC.

3.10 SUBSTRATE BOARD

- A. Gypsum Board: ASTM C 1177, Heavy duty coated glass-mat facer, water-resistant gypsum substrate for adhered roof applications, **5/8 inch (16 mm)** thick. Basis of design: Dens Deck Prime Roof Board

3.11 EDGE METAL COMPONENTS

- A. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product from single-source roofing system supplier that is included in the No Dollar Limit guarantee. Basis of design: Expand-O-Flash.

- B. Coping System: Manufacturer's factory fabricated coping consisting of a base piece and a snap-on cap. Provide product from single-source roofing system supplier that is included in the No Dollar Limit guarantee. Basis of design: Presto-Lock Coping
- C. Fascia System: Manufacturer's factory fabricated fascia consisting of a base piece and a snap-on cover. Provide product from single-source roofing system supplier that is included in the No Dollar Limit guarantee. Basis of design: Presto-Tite Fascia

PART 4 - EXECUTION

4.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with the requirements affecting performance of roofing system.
 - 1. General:
 - a. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - b. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 2. Steel Decks:
 - a. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 05 Section "Steel Decking."
 - 3. Concrete Decks:
 - a. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
 - b. Verify that concrete substrate is visibly dry and free of moisture.
 - 4. Ensure general rigidity and proper slope for drainage.
 - 5. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units more than **1/16 inch (1.6 mm)** out of plane relative to adjoining deck.
- B. Unacceptable panels should be brought to the attention of the General Contractor and Project Owner's Representative and shall be corrected prior to installation of roofing system.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

4.2 PREPARATION

- A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.
- C. If applicable, prime surface of deck with asphalt primer at a rate recommended by roofing manufacturer and allow primer to dry.
- D. Proceed with each step of installation only after unsatisfactory conditions have been corrected.

4.3 RE-ROOF PREPARATION

- A. Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc.
 - 1. Remove an area no larger than can be re-roofed in one day.
- B. Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.
- C. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations.
 - 1. Install decking to match existing as directed by Owner's Representative.
- D. Raise (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
 - 1. Modify curbs as required to provide a minimum 8" base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
 - 2. Secure of flashing and install new metal counterflashing prior to re-installation of unit.
 - 3. Perimeter nailers shall be elevated to match elevation of new roof insulation.
- E. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

4.4 SUBSTRATE BOARD INSTALLATION

- A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
 - 1. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof per roofing system manufacturer's written instructions. 7

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4.5 VAPOR-RETARDER INSTALLATION

- A. Install modified bituminous vapor retarder sheet per roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond eaves, installing as follows:
 - 1. Unroll roofing membrane sheets and allow them to relax for minimum time required by manufacturer.
 - 2. Self-adhere vapor retarder to substrate per roofing system manufacturer's instructions.
- B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
- C. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.

4.6 INSULATION INSTALLATION

- A. Coordinate installation of roof system components so insulation and cover board are not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation boards with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with like material.
- E. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
- F. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- H. Adhered Insulation: Adhere each layer of insulation to substrate as follows:
 - 1. Install each layer in a two-part urethane adhesive according to roofing system manufacturer's instruction.
 - 2. Install each layer to resist uplift pressure at corners, perimeter, and field of roof. 7

4.7 COVER BOARD INSTALLATION

- A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with cover board.
 - 1. Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- D. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.
 - 1. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- E. Adhered Cover Board: Adhere cover board to substrate as follows:
 - 1. Install in a two-part urethane adhesive according to roofing system manufacturer's instruction.
 - 2. Install to resist uplift pressure at corners, perimeter, and field of roof.

4.8 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
- B. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
- C. Where roof slope exceeds 1/2 inch per 12 inches (1:24), contact the membrane manufacturer for installation instructions regarding installation direction and backnailing
- D. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.

- E. Asphalt Heating: Heat roofing asphalt to temperature recommended by roofing manufacturer to flux modified membrane. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating. Discard roofing asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.
- F. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

4.9 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

- A. Install, **one** modified bituminous roofing membrane sheet, and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, with the following installation method:
 - 1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
 - 2. Adhere modified bituminous roofing membrane sheet to substrate in cold-applied adhesive according to roofing system manufacturer's instruction.
- B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
 - 2. As required, apply roofing granules to cover exuded bead at laps while bead is hot.
- C. Install roofing membrane sheets so side and end laps shed water.

4.10 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 - 2. Backer Sheet Application: Install backer sheet and adhere to substrate in approved adhesive applied at rate required by roofing system manufacturer.
 - 3. Flashing Sheet Application: Adhere flashing sheet to substrate in approved adhesive applied at rate required by roofing system manufacturer.
- B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.

- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
 - 1. Seal top termination of base flashing with a strip of glass-fiber fabric set in MBR Flashing cement.
- D. Roof Drains: Flash drain using liquid applied flashing (PermaFlash) system. Clamp roofing membrane, flashing, and stripping into roof-drain clamping ring.
 - 1. Install stripping according to roofing system manufacturer's written instructions.
- E. Flash all penetrations using liquid applied flashing (PermaFlash) system.

4.11 WALKWAY INSTALLATION

- A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
 - 1. Sweep away loose aggregate surfacing and set walkway pads in additional cold applied adhesive.

4.12 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical representative to inspect roofing installation on completion and submit report to Architect.
 - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

4.13 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.

- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

[End of Section]

SECTION 07530
SINGLE PLY MEMBRANE ROOFING SYSTEM

PART 1 - GENERAL

1.01 Description of Work

- A. This Section includes the following:
 - 1. Single-ply Membrane Roofing System
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Vapor Barriers - Section 07190
 - 3. Roof and Deck Insulation - Section 07240
 - 4. Traffic Topping - Section 07570
 - 5. Metal Flashing and Trim - Section 07620
 - 6. Gutters and Downspouts - Section 07631
 - 7. Manufactured Roof Specialties - Section 07710
 - 8. Sealants and Caulking - Section 07951
 - 9. Roof Drains - Section 15422

1.02 Performance Requirements

- A. General: Install a watertight sheet membrane roofing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.
 - 1. Factory Mutual Classification: Class 1A-90
 - 2. Underwriters Laboratories: Class A

1.03 Submittals

- A. Product Data: For each type of roofing product specified include data substantiating that materials comply with requirements.
- B. Manufacturer's Material Safety Data Sheets (MSDS): Submit with product data a copy of the MSDS.
- C. Shop Drawings: Indicate setting plan for flat and tapered insulation, joint or termination detail conditions, and conditions of interface with other materials.
- D. Samples: Submit three (3) 4" x 4" squares of sheet membrane.
- E. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, and/or licensed by manufacturer to install specified roofing system and is eligible to receive the specified roofing manufacturer's warranty.

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- F. Manufacturer Certificates: Signed by roofing system manufacturer certifying that the roofing system complies with the specified "Performance Requirements".
- G. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of components of roofing system with requirements based on comprehensive testing of current product compositions.
- I. Maintenance Data: For roofing system to include in the maintenance manuals specified in Division 1.
- J. Warranty: Sample copy of standard roofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.
- K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.04 Quality Assurance

- A. Installer Qualifications: Engage an experienced installer to perform the work of this Section who has specialized in installing roofing similar to that required for this Project; who is approved, authorized, or licensed by the roofing system manufacturer to install manufacturer's product; and, who is eligible to receive the standard roofing manufacturer's warranty of the specified length.
- B. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method indicated below by UL, FM, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; complying with ASTM E 108, for application and slopes indicated.
- C. Preinstallation Conference: Before installing roofing system, conduct conference at Project site. Notify participants at least five (5) working days before conference.
 - 1. Meet with Owner; Architect; Owner's insurer, if applicable; testing and inspecting agency representative; roofing installer; roofing system manufacturer's representative and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

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2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review loading limitations of deck during and after roofing.
4. Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
5. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.
6. Review temporary protection requirements for building and roofing system during and after installation.
7. Review roof maintenance and repair procedures after roofing installation.
8. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

1.05 Delivery, Storage and Handling

- A. Store roofing materials in a dry, warm, well-ventilated, weather tight location according to roofing system manufacturer's written instructions.
- B. Handle and store roofing materials and place equipment in a manner to avoid any damage to roof deck or structural supporting members.
- C. Do not leave unused membrane and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 °F (10 °C).
- D. 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.

1.06 Project Conditions

- A. Do not apply roofing membrane during inclement weather or when ambient temperatures are below 40 degrees F or above 85 degrees F.
- B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is occurring.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day.

1.07 Warranty

- A. Roofing Manufacturer's Warranty: Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in the roof membrane and base flashing resulting from defects in materials or workmanship for the following warranty period:
 - 1. Warranty Period: (20) years.
- B. Roofing Installer's Warranty: Submit a Roofing Installer's Warranty, on warranty form at end of this Section, signed by Installer, covering all roofing system components, including membrane roofing, base flashing, roofing insulation, fasteners, vapor barriers, etc., for the following warranty period:
 - 1. Warranty Period: (1) year from date of completion.

PART 2 – PRODUCTS

2.01 Manufacturers

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Single-ply Membrane Roofing System:
 - a. Johns Manville Roofing Systems
 - b. Carlisle Roofing Systems
 - c. Genflex Roofing Systems
 - d. Firestone Building Products Co. Inc. Or Equal

2.02 Single-Ply Membrane

- A. Membrane: ASTM D 4637, Type I, EPDM non-reinforced 0.060 inch thick; ten (10) foot wide roll; black color; and, conforming to the following criteria:

	<u>Properties</u>	<u>Test</u>	<u>Min. Performance</u>
1.	Tensile Strength	ASTMD412	1305 psi
2.	Elongation	ASTMD412	300%
3.	Tear Strength	ASTM D624	1501bs/in
4.	Water Absorption	ASTMD471	<=8%
5.	Low Temperature Brittleness	ASTM D746	-49 degrees F

2.03 Seaming Material: As recommended by membrane manufacturer.

2.04 Adhesive Materials

- A. Surface Conditioner: Solvent type, compatible with membrane.
- B. Membrane Adhesives: As recommended by membrane manufacturer.
- C. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

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2.05 Flashing

- A. Flexible Flashing: Uncured EPDM; conforming to the following:
 - 1. Thickness: 0.60 inch
 - 5. Color: black
- B. Counter flashing: Metal, as specified in Section 07620.
- C. Prefabricated Roof Specialties: As specified in Section 07710.

PART 3 - EXECUTION

3.01 Examination

- A. Examine substrates, areas, and conditions under which roofing will be applied, with Roofing System Manufacturer present, for compliance with requirements.
- B. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.
- C. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thickness of insulation required.

3.02 Preparation

- 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. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.02 Membrane Installation

- A. Apply membrane in accordance with manufacturer's instructions.
- B. Apply adhesive in accordance with manufacturer's instructions.
- C. Roll out membrane, free from air pockets, wrinkles, or tears. Firmly press sheet into place without stretching.
- D. Bond sheet to substrate except those areas directly over or within three (3) inches of a control or expansion joint.
- E. Overlap edges and ends and seal by contact adhesive, minimum three (3) inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- F. Extend membrane up a minimum of eight (8) inches onto vertical surfaces.
- G. Seal membrane around roof penetrations.

3.03 Flashing and Accessories

- A. Apply flexible flashing to seal membrane to vertical elements.
- B. Secure flashing beneath counter flashing as required by manufacturer.
- C. Coordinate installation of roof drains, curbs and pipe penetrations.
- D. Seal flashing and flanges of items penetrating membrane.

3.04 Field Quality Control

- A. Correct identified defects or irregularities that inspections indicate do not comply with specified requirements.
- B. Final inspection by roof system Manufacturer to ascertain that the roof has been installed according to manufacturer's specifications and details. Submit report of inspection to the County.

3.05 Protecting and Cleaning

- A. Protect roofing system from damage and wear during and after completion of all work. When remaining activities will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report to the County.
- B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair base flashing to a condition free of damage and deterioration at the time of completion and according to warranty requirements.
- C. Clean over spray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.06 Roofing Installer's Warranty

- A. The roofing system Installer will provide a written warranty covering a one (1) year period from the completion of the work.
- B. The language and form of the warranty will be as follows:

Owner: Nassau County
Address: (building address)

Warranty Period: (start date) to (end date)

WHEREAS Roofing Installer has contracted either directly with Owner or indirectly as a subcontractor to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period;

NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning
 - b. fire
 - c. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decompositions;
 - d. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and penetrations of the work;
 - e. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof has been paid by Owner or by another responsible party so designated.
3. The Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void, unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basis, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. The Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this ____ day of _____, _____.

(NAME OF CONTRACTOR)

(Authorized Signature)
(Print Name)
(Print Title)

(Notary Public)

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SECTION 75323
ETHYLENE PROPYLENE DIENE MONOMER (EPDM) MEMBRANE ROOFING
HIGH WIND APPLICATION

GENERAL

SECTION INCLUDES

FM RoofNav Requirements for Steel and Concrete Decks

Adhered EPDM membrane roofing system.

Cover board.

Roof insulation.

Vapor retarder.

Substrate board.

REFERENCES

Roofing Terminology: Refer to the following publications for definitions of roofing work related terms used in this Section:

ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing."

Glossary of NRCA's "The NRCA Roofing Manual."

Roof Consultants Institute "Glossary of Roofing Terms."

Sheet Metal Terminology and Techniques: SMACNA "Architectural Sheet Metal Manual."

DESIGN CRITERIA

General: Installed roofing membrane systems shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.

Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

Installer shall comply with current code requirements based on authority having jurisdiction.

Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

FMG Listing: Roofing membrane, base flashings, and component materials shall comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

For Steel Decks with high wind requirements:

Roofing system shall comply with RoofNav #: 461037-0-0

For Concrete Decks with high wind requirements:

Roofing system shall comply with RoofNav #: 458768-0-0

Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

SUBMITTALS

Product Data: Manufacturer's data sheets for each product to be provided.

Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:

Base flashings, cants, and membrane terminations.

Tapered insulation, including slopes.

Crickets, saddles, and tapered edge strips, including slopes.

Insulation fastening patterns.

Verification Samples: Provide for each product specified.

Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

Maintenance Data: Refer to Johns Manville's latest published documents on www.JM.com.

Guarantees: Provide manufacturer's current guarantee specimen.

Prior to roofing system installation, roofing sub-contractor shall provide a copy of the Guarantee Application Confirmation document issued by Johns Manville Roofing Systems indicating that the project has been reviewed for eligibility to receive the specified guarantee and registered.

QUALITY ASSURANCE

Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and is eligible to receive the specified manufacturer's guarantee.

Manufacturer Qualifications: Qualified manufacturer that has UL listing for roofing system identical to that used for this Project.

Testing Agency Qualifications: Independent testing agency with the experience and capability to conduct the testing indicated, as documented in accordance with ASTM E329.

Test Reports:

Roof drain and leader test or submit plumber's verification.

Source Limitations: Obtain all components from the single source roofing system manufacturer guaranteeing the roofing system. All products used in the system shall be labeled by the single source roofing system manufacturer issuing the guarantee.

Fire-Test-Response Characteristics: Roofing materials shall comply with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

DELIVERY, STORAGE, AND HANDLING

Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

PROJECT CONDITIONS

Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

GUARANTEES

Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.

Single-source special guarantee includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.

Guarantee Period: 20 years from date of Substantial Completion.

Contractor is required to list "INSERT FIRM NAME" as the Specifier/Consultant of record in the appropriate fields ("Specifier Account") when applying for the manufacturer's warranty.

Installer's Guarantee: Submit roofing Installer's guarantee, including all components of roofing system for the following guarantee period:

Guarantee Period: Two years from date of Substantial Completion.

Existing Guarantees: Guarantees on existing building elements should not be affected by scope of work.

Installer is responsible for coordinating with building owner's representative to verify compliance.

PRODUCTS

ETHYLENE PROPYLENE DIENE MONOMER ROOFING MEMBRANE - EPDM

Non-reinforced uniform, flexible sheet made from Ethylene Propylene Diene Monomer, ASTM D 4637, Type I. Basis of design: JM EPDM NR
Thickness (minimum): 60 mils (1.5 mm)
Exposed Face Color: Black.

AUXILIARY ROOFING MATERIALS

General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.

Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane. Basis of design: JM EPDM Peel & Stick Flashing.

Primer Material: Manufacturer's standard synthetic-rubber polymer primer. Basis of design: JM EPDM Tape Primer Plus JM EPDM Tape Primer Plus (Low VOC) JM Single Ply Membrane Primer (low VOC)

Liquid Applied Flashing: Manufacturer's single ply liquid and fabric reinforced flashing system created with a fleece polyester scrim and a two-component polyurethane based liquid applied flashing material, consisting of a liquid resin and a curing agent. Basis of design: JM SP Liquid Flashing Resin and JM SP Liquid Flashing Scrim

Liquid Applied Flashing Primer: Manufacturer's single ply liquid flashing primer. Basis of design: JM Single Ply Membrane Primer (Low VOC), JM SP Liquid Flashing Concrete Primer, or JM SP Liquid Flashing Metal and Wood Primer

Seaming Material: Manufacturer's standard 3-inch- (75-mm-) 6-inch- (150-mm-) wide minimum, butyl splice tape with release film. Basis of design: JM EPDM Seam Tape Plus

Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings. Basis of design: JM LVOC Membrane Adhesive

Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors. Basis of design: JM Termination Systems

Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer. Basis of design: High Load Fasteners and Plates

Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, termination reglets, T-joint cover, cover strips, sealants and other accessories. Basis of design: JM EPDM/PVC Pourable Sealer, JM One-Part Pourable Sealer, JM EPDM Peel & Stick Inside/Outside Corners, JM EPDM Peel & Stick Pipe Boots, JM EPDM Peel & Stick Pourable Sealer Pockets, JM EPDM Peel & Stick Sealing Strip, JM EPDM Peel & Stick T-Joint Patch, JM EPDM Protective Stone Mat, JM EPDM Reinforced Termination Strip with Tape (RTS), JM EPDM 10" RPS (Reinforced Perimeter Strip), JM EPDM Pre-Taped Curb Flashing, JM Single Ply LVOC Caulk, JM Weathered Membrane Cleaner, and JM Single Ply Sealing Mastic.

EDGE METAL COMPONENTS

Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of design: Expand-O-Flash.

Coping System: Manufacturer's factory fabricated coping consisting of a base piece and a snap-on cap. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of design: Presto-Lock Coping

Fascia System: Manufacturer's factory fabricated fascia consisting of a base piece and a snap-on cover. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of design: Presto-Tite Fascia (Single Ply Systems)

Metal/Membrane Flashing: Specially designed and manufactured flashing for sealing and waterproofing. JM EPDM Metal/Membrane Flashing

WALKWAYS

Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer. Basis of design: JM EPDM Peel & Stick Walkpads

COVER BOARD

High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs. of compressive strength. Basis of design: ProtectoR HD
Thickness: 1/2 inch (13 mm)
R-value: 2.5

ROOF INSULATION

General: Preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), Basis of design: ENRGY 3

1. Provide insulation package with minimum R Value: R-30.
2. Provide insulation package in multiple layers.

Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch.

Determined in accordance with CAN/ULC S770 at 75°F (24°C)

TAPERED INSULATION

Tapered Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated. Basis of design: Tapered ENRGY 3

INSULATION ACCESSORIES

General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated. Basis of design: DiamondBack Pre-Cut Crickets, DiamondBack Pre-Cut Miters or Tapered Fesco Edge Strip

Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer. Basis of design: All Purpose Fasteners

Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate. Basis of design: JM Two-Part Urethane Insulation Adhesive (UIA)

Wood Nailer Strips: Comply with requirements in Division 06 Section "Miscellaneous Rough Carpentry."

VAPOR RETARDER

Self-Adhered SBS Vapor Retarder: Tri-laminate woven polyethylene, nonslip UV protected top surface; suitable for application method specified. Basis of design: JM Vapor Barrier SAR.

Self-Adhered Primer: low VOC aerosol penetrating primer solution to enhance the adhesion of self-adhering membranes. SA Primer Low VOC.

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SUBSTRATE BOARD

High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs. of compressive strength. Basis of design: ProtectoR HD
Thickness: 1/2 inch (13 mm)
R-value: 2.5

EXECUTION

EXAMINATION

General:

Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.

Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

Steel Decks:

Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 05 Section "Steel Decking."

Concrete Decks:

Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.

Verify that concrete substrate is visibly dry and free of moisture.

Ensure general rigidity and proper slope for drainage.

Verify that deck is securely fastened with no projecting fasteners and with no adjacent units more than 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

Unacceptable panels should be brought to the attention of the General Contractor and Project Owner's Representative and shall be corrected prior to installation of roofing system.

PREPARATION

Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.

Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

If applicable, prime surface of deck with asphalt primer at a rate recommended by roofing manufacturer and allow primer to dry.

Proceed with each step of installation only after unsatisfactory conditions have been corrected.

RE-ROOF PREPARATION

Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc.

Remove an area no larger than can be re-roofed in one day.

Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.

Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations.

Install decking to match existing as directed by Owner's Representative.

Raise (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:

Modify curbs as required to provide a minimum 8" base flashing height measured from the surface of the new membrane to the top of the flashing membrane.

Secure of flashing and install new metal counterflashing prior to re-installation of unit.

Perimeter nailers shall be elevated to match elevation of new roof insulation.

Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

VAPOR-RETARDER INSTALLATION

Install modified bituminous vapor retarder sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond eaves, installing as follows:

Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

Self-adhere vapor retarder to substrate according to roofing system manufacturer's instruction.

Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

Repair tears and voids in laps and lapped seams not completely sealed.

Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.

INSULATION INSTALLATION

Coordinate installation of roof system components so insulation and cover board are not exposed to precipitation or left exposed at the end of the workday.

Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.

Install tapered insulation under area of roofing to conform to slopes indicated.

Install insulation boards with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with like material.

Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

Adhered Insulation: Adhere each layer of insulation to substrate as follows:

Install each layer in a two-part urethane adhesive according to roofing system manufacturer's instruction.

Install each layer to resist uplift pressure at corners, perimeter, and field of roof.

Mechanically Fastened with Subsequent Layers Adhered Insulation: Secure first layer of insulation to deck using mechanical fasteners designed and sized for fastening specified board-type to deck type.

Fasten first layer to resist uplift pressure at corners, perimeter, and field of roof.

Install subsequent layers in a two-part urethane adhesive according to roofing system manufacturer's instruction.

Install each layer to resist uplift pressure at corners, perimeter, and field of roof.

COVER BOARD INSTALLATION

Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.

Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.

Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with cover board.

Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.

Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

Adhered Cover Board: Adhere cover board to substrate as follows:

Install in a two-part urethane adhesive according to roofing system manufacturer's instruction.

Install to resist uplift pressure at corners, perimeter, and field of roof.

ROOFING MEMBRANE INSTALLATION, GENERAL

Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.

Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.

Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.

Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

Remove and discard temporary seals before beginning work on adjoining roofing.

ADHERED ROOFING MEMBRANE INSTALLATION

Install roofing membrane over area to receive roofing in accordance with membrane roofing system manufacturer's written instructions.

Unroll roofing membrane and allow to relax before installing.

Install sheet in accordance with roofing system manufacturer's written instructions.

Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

Bonding Adhesive: Apply solvent-based bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.

Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

Apply roofing membrane with side laps shingled with slope of roof deck where possible.

Field Fabricated Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.

Tape to Tape Installation: Align membrane for appropriate overlap, remove release liners and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation.

Tape to Standard Sheet Installation: Align membrane for appropriate overlap, clean and prime non-taped face of splice area, remove release liners and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation.

Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

BASE FLASHING INSTALLATION

Install sheet flashings and preformed flashing accessories and adhere to substrates in accordance with membrane roofing system manufacturer's written instructions.

Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

Apply single ply liquid applied flashing system per manufacturer's written instructions.

Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

Clean seam areas and overlap and firmly roll sheet flashings into the adhesive.

Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

WALKWAY INSTALLATION

Flexible Walkways: Install walkway products in locations indicated. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

FIELD QUALITY CONTROL

Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

Final Roof Inspection: Arrange for roofing system manufacturer's technical representative to inspect roofing installation on completion and submit report to Architect.
Notify Architect or Owner 48 hours in advance of date and time of inspection.

Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

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Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

PROTECTION AND CLEANING

Protect roofing system from damage and wear during remainder of construction period.

Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

[End of Section]

SECTION 75423
SINGLE PLY (TPO) MEMBRANE ROOFING SYSTEM

PART 1 - GENERAL

1.01 Description of Work

- A. This Section includes the following:
 - 1. Single-ply (TPO) Membrane Roofing System
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Vapor Barriers - Section 07190
 - 3. Roof and Deck Insulation - Section 07240
 - 4. Traffic Topping - Section 07570
 - 5. Metal Flashing and Trim - Section 07620
 - 6. Gutters and Downspouts - Section 07631
 - 7. Manufactured Roof Specialties - Section 07710
 - 8. Sealants and Caulking - Section 07951
 - 9. Roof Drains - Section 15422

1.02 Performance Requirements

- A. General: Install a watertight sheet membrane roofing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather without failure.
 - 1. Factory Mutual Classification: Class 1A-90
 - 2. Underwriters Laboratories: Class A

1.03 Submittals

- A. Product Data: For each type of roofing product specified include data substantiating that materials comply with requirements.
- B. Manufacturer's Material Safety Data Sheets (MSDS): Submit with product data a copy of the MSDS.
- C. Shop Drawings: Indicate setting plan for flat and tapered insulation, joint or termination detail conditions, and conditions of interface with other materials.
- D. Samples: Submit three (3) 4" x 4" squares of sheet membrane.
- E. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, and/or licensed by manufacturer to install specified roofing system and is eligible to receive the specified roofing manufacturer's warranty.

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- F. Manufacturer Certificates: Signed by roofing system manufacturer certifying that the roofing system complies with the specified "Performance Requirements".
- G. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- H. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of components of roofing system with requirements based on comprehensive testing of current product compositions.
- I. Maintenance Data: For roofing system to include in the maintenance manuals specified in Division 1.
- J. Warranty: Sample copy of standard roofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.
- K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.04 Quality Assurance

- A. Installer Qualifications: Engage an experienced installer to perform the work of this Section who has specialized in installing roofing similar to that required for this Project; who is approved, authorized, or licensed by the roofing system manufacturer to install manufacturer's product; and, who is eligible to receive the standard roofing manufacturer's warranty of the specified length.
- B. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method indicated below by UL, FM, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; complying with ASTM E 108, for application and slopes indicated.
- B. Preinstallation Conference: Before installing roofing system, conduct conference at Project site. Notify participants at least five (5) working days before conference.

1. Meet with Owner; Architect; Owner's insurer, if applicable; testing and inspecting agency representative; roofing installer; roofing system manufacturer's representative and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review loading limitations of deck during and after roofing.
4. Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
5. Review governing regulations and requirements for insurance, certifications, and inspection and testing, if applicable.
6. Review temporary protection requirements for building and roofing system during and after installation.
7. Review roof maintenance and repair procedures after roofing installation.
8. Document proceedings, including corrective measures or actions required, and furnish copy of record to each participant.

1.05 Delivery, Storage and Handling

- A. Store roofing materials in a dry, warm, well-ventilated, weather tight location according to roofing system manufacturer's written instructions.
- B. Handle and store roofing materials and place equipment in a manner to avoid any damage to roof deck or structural supporting members.
- C. Do not leave unused membrane and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 °F (10 °C).
- D. 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.

1.06 Project Conditions

- A. Do not apply roofing membrane during inclement weather or when ambient temperatures are below 40 degrees F or above 85 degrees F.

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- B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is occurring.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day.

1.07 Warranty

- A. Roofing Manufacturer's Warranty: Submit a written warranty, without monetary limitation, signed by roofing system manufacturer agreeing to promptly repair leaks in the roof membrane and base flashing resulting from defects in materials or workmanship for the following warranty period:
 - 1. Warranty Period: (20) years.
- B. Roofing Installer's Warranty: Submit a Roofing Installer's Warranty, on warranty form at end of this Section, signed by Installer, covering all roofing system components, including membrane roofing, base flashing, roofing insulation, fasteners, vapor barriers, etc., for the following warranty period:
 - 1. Warranty Period: (1) year from date of completion.

PART 2 – PRODUCTS

2.01 Manufacturers

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Single-ply Membrane Roofing System:
 - c. Johns Manville Roofing Systems
 - d. Carlisle Roofing Systems
 - c. Genflex Roofing Systems
 - d. Firestone Building Products Co. Inc. Or Equal

2.02 Single-Ply Membrane

- A. Membrane: ASTM D 6878, Thermoplastic Polyolefin (TPO) reinforced 0.060 inch thick; ten (10) foot wide roll; white color; and, conforming to the following criteria:

Property	ASTM Test Method	Unit of Measure	JM TPO 60
Overall Sheet Thickness	D751	inches	0.06
Thickness Over Reinforcement	D7635	inches	0.027
Breaking Strength (MD/XMD)	D751	lbf	411 / 388
Breaking Strength - Post Heat Aged (MD/XMD)	D751	% of initial	> 90% / > 90%
Elongation at Break (MD/XMD)	D751	%	27% / 27%
Water Absorption	D471	%	0.0011
Puncture Resistance	FTMS 101C, Method 2031	lbf	371

2.03 Seaming Material: As recommended by membrane manufacturer.

2.04 Adhesive Materials

- A. Surface Conditioner: Solvent type, compatible with membrane.
- B. Membrane Adhesives: As recommended by membrane manufacturer.
- C. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

2.05 Flashing

- A. Sheet Flashing: Manufacturer's internally reinforced or scrim reinforced, smooth backed membrane with same thickness and color as sheet membrane. Basis of design: JM TPO
- B. Counter flashing: Metal, as specified in Section 07620.
- C. Prefabricated Roof Specialties: As specified in Section 07710.

PART 3 - EXECUTION

3.01 Examination

- C. Examine substrates, areas, and conditions under which roofing will be applied, with Roofing System Manufacturer present, for compliance with requirements.
- B. Verify that roof openings and penetrations are in place and set and braced and that roof drains are properly clamped into position.
- C. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at roof penetrations and terminations and match the thickness of insulation required.

3.02 Preparation

- 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. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.02 Membrane Installation

- A. Apply membrane in accordance with manufacturer's instructions.
- B. Apply adhesive in accordance with manufacturer's instructions.
- C. Roll out membrane, free from air pockets, wrinkles, or tears. Firmly press sheet into place without stretching.
- D. Bond sheet to substrate except those areas directly over or within three (3) inches of a control or expansion joint.
- E. Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
- F. Extend membrane up a minimum of eight (8) inches onto vertical surfaces.
- G. Seal membrane around roof penetrations.

3.03 Flashing and Accessories

- A. Apply flexible flashing to seal membrane to vertical elements.
- B. Secure flashing beneath counter flashing as required by manufacturer.
- C. Coordinate installation of roof drains, curbs and pipe penetrations.
- D. Seal flashing and flanges of items penetrating membrane.

3.04 Field Quality Control

- A. Correct identified defects or irregularities that inspections indicate do not comply with specified requirements.
- D. Final inspection by roof system Manufacturer to ascertain that the roof has been installed according to manufacturer's specifications and details. Submit report of inspection to the County.

3.05 Protecting and Cleaning

- A. Protect roofing system from damage and wear during and after completion of all work. When remaining activities will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report to the County.
- B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair base flashing to a condition free of damage and deterioration at the time of completion and according to warranty requirements.
- C. Clean over spray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.06 Roofing Installer's Warranty

- A. The roofing system Installer will provide a written warranty covering a one (1) year period from the completion of the work.
- B. The language and form of the warranty will be as follows:

Owner: Nassau County
Address: (building address)

Warranty Period: (start date) to (end date)

WHEREAS Roofing Installer has contracted either directly with Owner or indirectly as a subcontractor to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period;

NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

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This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning
 - b. fire
 - c. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decompositions;
 - d. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and penetrations of the work;
 - e. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof has been paid by Owner or by another responsible party so designated.
3. The Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

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4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void, unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basis, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. The Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this ____ day of _____, _____.

(NAME OF CONTRACTOR)

(Authorized Signature)
(Print Name)
(Print Title)

(Notary Public)

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SECTION 75423-A
THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING
HIGH WIND APPLICATION

GENERAL

SECTION INCLUDES

FM Roof Nav Requirements for Steel and Concrete Decks

Adhered TPO membrane roofing system.

Cover board.

Roof insulation.

Vapor retarder.

Substrate board.

REFERENCES

Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:

ASTM D 1079 "Standard Terminology Relating to Roofing and Waterproofing."
Glossary of NRCA's "The NRCA Roofing and Waterproofing Manual."
Roof Consultants Institute "Glossary of Building Envelope Terms."

Sheet Metal Terminology and Techniques: SMACNA "Architectural Sheet Metal Manual."

DESIGN CRITERIA

General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.

Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

Installer shall comply with current code requirements based on authority having jurisdiction.

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Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

FMG Listing: Roofing membrane, base flashings, and component materials shall comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

For Steel Decks with high wind requirements:

Roofing system shall comply with RoofNav #: 461658-0-0

For Concrete Decks with high wind requirements:

Roofing system shall comply with RoofNav #: 458778-0-0

Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

SUBMITTALS

Product Data: Manufacturer's data sheets for each product to be provided.

Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:

Base flashings and membrane terminations.

Tapered insulation, including slopes.

Crickets, saddles, and tapered edge strips, including slopes.

Insulation fastening and adhesive patterns.

Verification Samples: Provide for each product specified.

Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

Maintenance Data: Refer to Johns Manville's latest published documents on www.JM.com.

Guarantees: Provide manufacturer's current guarantee specimen.

Prior to roofing system installation, roofing sub-contractor shall provide a copy of the Guarantee Application Confirmation document issued by Johns Manville Roofing Systems indicating that the project has been reviewed for eligibility to receive the specified guarantee and registered.

QUALITY ASSURANCE

Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's guarantee.

Manufacturer Qualifications: Qualified manufacturer that has UL listing for roofing system identical to that used for this Project.

Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 329.

Test Reports:

Roof drain and leader test or submit plumber's verification.

Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system shall be labeled by the single source roofing manufacturer issuing the guarantee.

DELIVERY, STORAGE, AND HANDLING

Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

PROJECT CONDITIONS

Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

GUARANTEE

Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.

Single-source special guarantee includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.

Guarantee Period: 20 years from date of Substantial Completion.

Contractor is required to list "INSERT FIRM NAME" as the Specifier/Consultant of record in the appropriate fields ("Specifier Account") when applying for the manufacturer's warranty.

Installer's Guarantee: Submit roofing Installer's guarantee, including all components of roofing system for the following guarantee period:

Guarantee Period: Two years from date of Substantial Completion.

Existing Guarantees: Guarantees on existing building elements should not be affected by scope of work.

Installer is responsible for coordinating with building owner's representative to verify compliance.

PRODUCTS

THERMOPLASTIC POLYOLEFIN ROOFING MEMBRANE - TPO

Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D 6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced. Basis of design: JM TPO

Membrane Thickness: 60 mils (1.52 mm), nominal

Fabric Fleece Backed Membrane Thickness: 60 mils (1.52 mm), nominal

Exposed Face Color: White

AUXILIARY ROOFING MATERIALS – SINGLE PLY

General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.

Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

Sheet Flashing: Manufacturer's internally reinforced or scrim reinforced, smooth backed membrane with same thickness and color as sheet membrane. Basis of design: JM TPO

Bonding Adhesive: Manufacturer's standard solvent -based bonding adhesive for membrane, and solvent -based bonding adhesive for base flashings. Basis of design: JM All Season Sprayable Bonding Adhesive.

Liquid Applied Flashing: Manufacturer's single ply liquid and fabric reinforced flashing system created with a fleece polyester scrim and a two-component polyurethane based liquid applied flashing material, consisting of a liquid resin and a curing agent. Basis of design: JM SP Liquid Flashing Resin and JM SP Liquid Flashing Scrim

Liquid Applied Flashing Primer: Manufacturer's single ply liquid flashing primer. Basis of design: JM SP Liquid Flashing TPO and PVC Primer, JM SP Liquid Flashing Concrete Primer, or JM SP Liquid Flashing Metal and Wood Primer

Slip Sheet: Manufacturer's recommended slip sheet, of type required for application. Basis of design: JM 3 –oz Polyester Slipsheet

Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors. Basis of design: JM Termination Systems

Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer. Basis of design: High Load Fasteners and Plates

Miscellaneous Accessories: Provide pourable sealers, primers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, cover strips, and other accessories required for full installation. Basis of design: JM TPO Pourable Sealer A & B, JM TPO Pipe Boots, JM TPO Universal Corners, JM TPO Edge Sealant, JM TPO T-Joint Patch, JM TPO Membrane Cleaner, JM TPO Membrane Primer, JM TPO Membrane Primer (Low VOC), JM TPO Sealing Mastic, JM TPO Cover Tape, JM TPO Detail Membrane, JM TPO Peel & Stick 10" RPS, JM TPO Peel & Stick 6" RTS, JM TPO-Coated Metal, JM TPO Curb Flashing and JM Single Ply Caulk

WALKWAYS

Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer. Basis of design: JM TPO Walkpad

COVER BOARD

High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs of compressive strength. Basis of design: ProtectoR HD
Thickness: 1/2 inch (13 mm)
R-value: 2.5

ROOF INSULATION

General: Preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), Basis of design: ENRGY 3

1. Provide insulation package with minimum R Value: minimum required by applicable code.
2. Provide insulation package in multiple layers.

Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch.

Determined in accordance with CAN/ULC S770 at 75°F (24°C)

TAPERED INSULATION

Tapered Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated. Basis of design: Tapered ENRGY 3

INSULATION ACCESSORIES

General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated. Basis of design: Diamondback Pre-Cut Cricket, Diamondback Pre-Cut Miter, or Tapered Fesco Edge Strip

Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer. Basis of design: UltraFast Fasteners and Plates

Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate. Basis of design: JM Two-Part Urethane Insulation Adhesive (UIA)

Wood Nailer Strips: Comply with requirements in Division 06 Section "Miscellaneous Rough Carpentry."

VAPOR RETARDER

Self-Adhered SBS Vapor Retarder: Tri-laminate woven polyethylene, nonslip UV protected top surface; suitable for application method specified. Basis of design: JM Vapor Barrier SAR.

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Self-Adhered Primer: low VOC aerosol penetrating primer solution to enhance the adhesion of self-adhering membranes. SA Primer Low VOC.

SUBSTRATE BOARD

High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 1, High-density Polyisocyanurate technology bonded in-line to inorganic coated glass facers with greater than 80 lbs of compressive strength. Basis of design: ProtectoR HD
Thickness: 1/2 inch (13 mm)
R-value: 2.5

EDGE METAL COMPONENTS

Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product from single-source roofing system supplier that is included in the No Dollar Limit guarantee. Basis of design: Expand-O-Flash

Coping System: Manufacturer's factory fabricated coping consisting of a base piece and a snap-on cap. Provide product from single-source roofing system supplier that is included in the No Dollar Limit guarantee. Basis of design: Presto-Lock Coping

Fascia System: Manufacturer's factory fabricated fascia consisting of a base piece and a snap-on cover. Provide product from single-source roofing system supplier that is included in the No Dollar Limit guarantee. Basis of design: Presto-Tite Fascia

Metal Edge System: Manufacturer's factory fabricated metal edge system used to terminate the roof at the perimeter of the structure. Provide product from single-source roofing system supplier that is included in the No Dollar Limit guarantee. Basis of design: Presto-Weld Drip Edge

EXECUTION

EXAMINATION

Examine substrates, areas, and conditions for compliance with the requirements affecting performance of roofing system.

General:

Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.

Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

Steel Decks:

Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 05 Section "Steel Decking."

Concrete Decks:

Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.

Verify that concrete substrate is visibly dry and free of moisture.

Ensure general rigidity and proper slope for drainage.

Verify that deck is securely fastened with no projecting fasteners and with no adjacent units more than 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

Unacceptable panels should be brought to the attention of the General Contractor and Project Owner's Representative and shall be corrected prior to installation of roofing system.

PREPARATION

Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.

Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

If applicable, prime surface of deck with asphalt primer at a rate recommended by roofing manufacturer and allow primer to dry.

Proceed with each step of installation only after unsatisfactory conditions have been corrected.

RE-ROOF PREPARATION

Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc.

Remove an area no larger than can be re-roofed in one day.

Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.

Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations.

Install decking to match existing as directed by Owner's Representative.

Raise (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:

Modify curbs as required to provide a minimum 8" base flashing height measured from the surface of the new membrane to the top of the flashing membrane.

Secure of flashing and install new metal counterflashing prior to re-installation of unit.

Perimeter nailers shall be elevated to match elevation of new roof insulation.

Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

SUBSTRATE BOARD INSTALLATION

Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof per roofing system manufacturer's written instructions.

BASE-SHEET INSTALLATION

Install one lapped base sheet course and mechanically fasten to substrate per roofing system manufacturer's written instructions.

Enhance fastening rate in perimeter and corner zones per code requirements, wind uplift system approvals or manufacturer's guarantee requirements, whichever is more stringent.

Comply with roofing system manufacturer's written instructions for installing roof insulation.

VAPOR-RETARDER INSTALLATION

Install modified bituminous vapor retarder sheet per roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

Unroll roofing membrane sheets and allow them to relax for minimum time required by manufacturer.

Self-adhere vapor retarder to substrate per roofing system manufacturer's instructions.

Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

Repair tears and voids in laps and lapped seams not completely sealed.

Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.

INSULATION INSTALLATION

Coordinate installation of roof system components so insulation and cover board are not exposed to precipitation or left exposed at the end of the workday.

Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.

Install tapered insulation under area of roofing to conform to slopes indicated.

Install insulation boards with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with like material.

Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

Adhered Insulation: Adhere each layer of insulation to substrate as follows:

Install each layer in a two-part urethane adhesive according to roofing system manufacturer's instruction.

Install each layer to resist uplift pressure at corners, perimeter, and field of roof.

Mechanically Fastened with Subsequent Layers Adhered Insulation: Secure first layer of insulation to deck using mechanical fasteners designed and sized for fastening specified board-type to deck type.

Fasten first layer to resist uplift pressure at corners, perimeter, and field of roof.

Install subsequent layers in a two-part urethane adhesive according to roofing system manufacturer's instruction.

Install each layer to resist uplift pressure at corners, perimeter, and field of roof.

COVER BOARD INSTALLATION

Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.

Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.

Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with cover board.

Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.

Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

Adhered Cover Board: Adhere cover board to substrate as follows:

Install in a two-part urethane adhesive according to roofing system manufacturer's instruction.

Install to resist uplift pressure at corners, perimeter, and field of roof.

ROOFING MEMBRANE INSTALLATION, GENERAL

Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.

Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.

Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.

Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

Remove and discard temporary seals before beginning work on adjoining roofing.

ADHERED ROOFING MEMBRANE INSTALLATION

Install roofing membrane over area to receive roofing in accordance with membrane roofing system manufacturer's written instructions.

Unroll roofing membrane and allow to relax before installing.

Install sheet in accordance with roofing system manufacturer's written instructions.

Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

Solvent Based Bonding Adhesive for smooth backed membranes: Apply solvent-based bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.

Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

Apply roofing membrane with side laps shingled with roof slope, where possible.

Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.

Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.

Verify field strength of seams a minimum of twice daily and repair seam sample areas.

Remove and repair any unsatisfactory sections before proceeding with installation.

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Repair tears, voids, and incorrectly lapped seams in roofing membrane that do not meet requirements.

Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

Install roofing membrane and auxiliary materials to tie into existing roofing.

BASE FLASHING INSTALLATION

Install sheet flashings and preformed flashing accessories and adhere to substrates per membrane roofing system manufacturer's written instructions.

Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

Apply single ply liquid applied flashing system per manufacturer's written instructions.

Flash penetrations and field-formed inside and outside corners per manufacturer's installation instructions.

Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

WALKWAY INSTALLATION

Flexible Walkways: Install walkway products in locations indicated. Heat weld and adhere walkway products to substrate according to roofing system manufacturer's written instructions.

FIELD QUALITY CONTROL

Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

Final Roof Inspection: Arrange for roofing system manufacturer's technical representative to inspect roofing installation on completion and submit report to Architect.
Notify Architect or Owner 48 hours in advance of date and time of inspection.

Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

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PROTECTION AND CLEANING

Protect roofing system from damage and wear during remainder of construction period.

Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

[END OF SECTION]

75423A-13

SECTION 07570
TRAFFIC TOPPING

PART 1 - GENERAL

1.01 Description of Work

A. This Section includes the following:

1. Walkway Pads

B. Related Work Described Elsewhere:

1. Rough Carpentry - Section 06100
2. Vapor Barriers - Section 07190
3. Roof and Deck Insulation - Section 07240
4. Built-Up Bituminous Roofing - Section 07510
5. Metal Flashing and Trim - Section 07620
6. Gutters and Downspouts - Section 07631
7. Gravel Stops - Section 07660
8. Sealants and Caulking - Section 07951
9. Roof Drains-Section 15422

1.02 Submittals

A. Samples for Verification: Submit samples of the following products in the sizes and numbers indicated:

1. 24" x 24" square walkway pad.

PART 2 - PRODUCTS

2.01 Walkway Pads

A. Mineral-surfaced asphaltic composition panels, factory formed, nonporous, with a slip-resisting surface texture, manufactured specifically for adhering to built-up roofing as a protection course for foot traffic, of the following thickness:

1. Thickness: ½ inch

B. Products: Subject to compliance with requirements, provide one of the following:

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1. DynaTred Plus Roof Walkway; Johns Manville
2. Whitewalk Roof Pads; W. R. Meadows
3. Carey-Tred; Celotex Corp.
4. GAF Walkway Pads

PART 3 - EXECUTION

3.01 Walkway Pad Installation

- A. Install walkway pads at locations in accordance to manufacturer spec's.
- B. Sweep away loose aggregate surfacing and set walkway pads in additional flood coat of hot roofing asphalt.

[END OF SECTION]

07570-2

SECTION 07620 METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 Description of Work

A. This section includes the following:

1. Metal Flashing.
2. Scuppers.
3. Counter Flashing over base flashing.
4. Counter Flashing at roof mounted equipment and vent stacks.
5. Aluminum Coping

B. Related Work Described Elsewhere:

1. Rough Carpentry - Section 06100
2. Vapor Barriers - Section 07190
3. Roof and Deck Insulation - Section 07240
4. Asphalt Shingle Roofing - Section 07311
5. Built-Up Bituminous Roofing - Section 07510
6. Single-Ply Sheet Roofing - 07530
7. Traffic Topping - Section 07570
8. Metal Flashing and Trim - Section 07620
9. Gutters and Down spouts - Section 07631
10. Gravel Stops - Section 07660
11. Sealants and Caulking - Section 07951
12. Roof Drains - Section 15422

1.02 Submittals

A. Shop Drawings

1. Indicate type of material, material profile (thickness), jointing pattern, jointing details, seams, fastening methods, flashing, terminations, and installation details.

B. Manufacturer's Product Data

1. Submit Manufacturer's product specifications, installation instructions and general recommendations for each specified sheet metal and prefabricated product.

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C. Samples

1. Submit two (2) samples, 4" x 4" in size, illustrating typical material, finish, color, etc. of each item specified.

1.03 Quality Assurance

- A. Perform work in accordance with AISI, SMACNA, and NRCA standard details and requirements.

1.04 Qualifications

- A. Fabricator and Installer
 - 1. Company specializing in sheet metal flashing work with five (5) years documented experience.

1.05 Delivery, Storage and Handling

- A. Deliver, store, protect and handle products in a manner that will ensure protection and prevent damage to the products.
- B. Stack performed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.06 Coordination

- A. Coordinate work of this Section with the work of related Sections indicated in paragraph 1.01.
- B. Coordinate work of this Section with interfacing and adjoining work for proper sequence of installation.

PART 2 - PRODUCTS

2.01 Sheet Materials

- A. Aluminum: ASTM B209; 0.050 inch thick; mill finish.
- B. Copper: ASTM B101; Type I, Grade 2, Class A; 20 ounce.
- C. Lead Coated Copper: ASTM B101-12; Type I, Class A; 20 ounce
- D. Stainless Steel: ASTM A167; Type 304; minimum 0.0187 inch thickness; No. 2D finish.

07620-2

- D. Aluminum Coping

- 1. Provide 16-gauge aluminum coping at parapets. All corners shall be welded in place. Provide spring action anchor plates and splices plates with butyl sealant at joints.

2.02 Accessories

- A. Fasteners: Same material and finish as flashing metal with soft neoprene washers; conform to Federal Specification FF-H-105.
- B. Underlayment: ASTM D226 No. 15 asphalt saturated roofing felt.
- C. Primer: Zinc chromate type.
- D. Protective Backing Paint: Bituminous.
- E. Sealant: Specified in Section 07900.
- F. Reglets: Recessed type, galvanized steel.
- G. Flux: Rosin type.

2.03 Fabrication

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
 - B. Form pieces in longest possible lengths.
 - C. Hem exposed edges on underside 1/2 inch; miter and seam comers.
 - D. Fabricate non-moving seems in sheet metal with flat lock seams. For metal other than aluminum, tin edges to be seamed, form seams with solder. Form aluminum seams with epoxy seam sealer, rivet joints for additional strength where required.
 - E. Fabricate comers from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
 - F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
 - G. Fabricate flashing to allow toe to extend two (2) inches over roofing. Return and brake edges.
 - H. Expansion Provisions: Where lapped or bayonet type provisions cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges not less than one (1) inch deep, filled with mastic sealant.
- 07620-3
- I Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact with a permanent coating as recommended by the Manufacturer.

2.04 Finish

- A. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of fifteen (15) mil.

PART 3 - EXECUTION

3.01 Examination

- A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashing are in place, sealed, and secure.

3.02 Preparation

- A. Install starter and edge strips, and cleats before starting installation.

3.03 Installation

- A. Comply with Manufacturer's installation instructions and recommendations, and with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual.
- B. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units.
- C. Conceal fasteners where possible.
- D. Install work with laps, joints and seams which will be permanently watertight and weatherproof.
Extend base flashing four (4) inches out onto roof in horizontal direction. Extend flashing eight (8) inches above finished roof surfaces in vertical direction.
- F. Extend counter flashing down over base flashing a minimum of three (3) inches.
Lap counter flashing a minimum of six (6) inches.

3.04 Field Quality Control

- A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

[END OF SECTION]

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SECTION 07631

GUTTERS AND DOWNSPOUTS

PART 1 - GENERAL

1.01 Description of Work

- A. This section includes the following:
 - 1. Aluminum gutters and downspouts.
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Vapor Barriers - Section 07190
 - 3. Roof and Deck Insulation - Section 07240
 - 4. Asphalt Shingle Roofing - Section 07311
 - 5. Built-Up Bituminous Roofing - Section 07510
 - 6. Single-Ply Sheet Roofing - 07530
 - 7. Traffic Topping - Section 07570
 - 8. Metal Flashing and Trim - Section 07620
 - 9. Gravel Stops - Section 07660
 - 10. Sealants and Caulking - Section 07951
 - 11. Roof Drains - Section 15422

1.02 Quality Assurance - Comply with the following:

- A. ASTM A167 - Standard Specification for Stainless and Heat-Resisting, Chromium-Nickel Steel Plate.
- B. ASTM A446/A446M - Standard Specification for Steel Sheet, Zinc Coated
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- D. FS TT-C-494 - Coating Compound, Bituminous, Solvent-Type, Acid Resistant.
- E. MACNA (Sheet Metal and Air Conditioning Contractors National Association) - Architectural Sheet Metal Manual.

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1.03 Submittals

- A. Section 01300 - Submittals: Procedures for submittals.

- B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
- C. Product Data: Provide data on prefabricated components.
- D. Samples: Submit two samples, 6" long illustrating component design, finish, color, and configuration.

1.04 Product Handling

- A. Deliver, store, protect and handle products to site in accordance with manufacturer's recommendations and industry standards.
- B. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
- C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

PART 2 - PRODUCTS

2.01 Materials

- A. Aluminum Sheet: ASTM B209, 6061 alloy, T6 temper; 0.050 inch thick; plain finish, shop pre-coated with Kynar 500 coating of color as selected.

2.02 Components

- A. Gutters: SMACNA Rectangular style profile.
- B. Downspouts: SMACNA Rectangular profile.
- C. Accessories: Profiled to suit gutters and downspouts.

2.03 Accessories

- A. Anchorage Devices: Type recommended by manufacturer/fabricator.
- B. Downspout Supports: Brackets and straps.
- C. Fasteners: Stainless steel, with soft neoprene washers.

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- D. Primer: Zinc chromate type.
- E. Protective Backing Paint: Zinc chromate alkyd.

2.04 Fabrication

- A. Form gutters and downspouts of profiles and sizes indicated.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
- D. Hem exposed edges of metal.
- E. Fabricate gutter and downspout accessories; seal watertight.

2.05 Finishes

- A. Prepare surfaces in accordance with the requirements for Kynar 500 finishing.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of fifteen (15) mil.

PART 3 - EXECUTION

3.01 General Preparation

- A. Verify that surfaces are ready to receive work.

3.02 Installation

- A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.
- B. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.
- C. Slope gutters 1/32" per foot minimum.
- D. Seal metal joints watertight.

[END OF SECTION]

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SECTION 07710
MANUFACTURED ROOF SPECIALTIES

PART 1 - GENERAL

1.01 Description of Work

- A. This section includes the following:
 - 1. Gravel stops.
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Vapor Barriers - Section 07190
 - 3. Roof and Deck Insulation - Section 07240
 - 4. Asphalt Shingle Roofing - Section 07311
 - 5. Built-Up Bituminous Roofing - Section 07510
 - 6. Single-Ply Sheet Roofing - 07530
 - 7. Traffic Topping - Section 07570
 - 8. Metal Flashing and Trim - Section 07620
 - 9. Gutters and Down spouts - Section 07631
 - 10. Gravel Stops - Section 07660
 - 11. Sealants and Caulking - Section 07951
 - 12. Roof Drains - Section 15422

1.02 Quality Assurance - Comply with the following:

- A. ASTM D2822 - Asphalt Roof Cement.
- B. NRCA (National Roofing Contractors Association) - Roofing and Waterproofing Manual.
- C. SMACNA - Architectural Sheet Metal Manual.

1.03 Submittals

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimensions of components, adjacent construction, required clearances and tolerances, and other affected work.

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- D. Samples:
 - 1. Submit two samples, six (6) inches in size illustrating component shape, finish and color.

1.04 Delivery, Storage and Handling

- A. Deliver, store, protect and handle products in a manner that will ensure protection and prevent damage to the products.
- B. Stack performed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.05 Coordination

- A. Coordinate work of this Section with the work of related Sections indicated in paragraph 1.01.
- B. Coordinate work of this Section with interfacing and adjoining work for proper sequence of installation.

PART 2 - PRODUCTS

2.01 Manufacturer's

- A. Cheney Flashing Co., Model "Type 7" one piece gravel stop.
- B. W.P. Hickman Co., Model "Formed" gravel stop.
- C. M. M. Systems Corporation, Model "Form Line" gravel stop.

2.02 Components

- A. Gravel Stops: Formed aluminum, 0.050 inch thick, shaped as required, including special supports spaced per manufacturer's recommendations. Include cover plates to conceal and weather seal joints and attachment flanges.

2.03 Accessories

- A. Sealant: Manufacturer's standard type suitable for use with installation of system; non-staining, non-skinning, non-shrinking and non-sagging; ultra violet and ozone resistant.

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- B. Roofing Cement: As recommended by manufacturer.

2.04 Finishes

- A. Aluminum: Kynar 500 finish.

PART 3 - EXECUTION

3.01 Examination

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 Installation

- A. Install components in accordance with manufacturer's instructions
- B. Conform to SMAC - Architectural Sheet Metal Manual and NRCA - Waterproofing Manual drawing details.
- C. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- D. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

[END OF SECTION]

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SECTION 07951
SEALANTS AND CAULKING

PART 1 - GENERAL

1.01 Description of Work

- A. This Section includes the following:
 - 1. Joint Sealants.
- B. Related Work Described Elsewhere:
 - 1. Rough Carpentry - Section 06100
 - 2. Vapor Barriers - Section 07190
 - 3. Roof and Deck Insulation - Section 07240
 - 4. Asphalt Shingle Roofing - Section 07311
 - 5. Built-Up Bituminous Roofing - Section 07510
 - 6. Single-Ply Sheet Roofing - 07530
 - 7. Traffic Topping - Section 07570
 - 8. Metal Flashing and Trim - Section 07620
 - 9. Gutters and Down spouts - Section 07631
 - 10. Gravel Stops - Section 07660
 - 11. Sealants and Caulking - Section 07951
 - 12. Roof Drains-Section 15422

1.02 Quality Assurance

- A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- B. Installer Qualifications: Engage an experienced Installer who has completed Joint sealant applications similar to material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.
- C. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each difference product required.
- D. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers samples of materials that will contact or affect joint sealants for compatibility and adhesion testing as indicated below:

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- 1. Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion.

2. Schedule sufficient time for testing and analysis of results to prevent delay in the progress of the Work.
 3. Investigate materials failing compatibility or adhesion tests and obtain joint sealant manufacturer's written recommendations for corrective measures, including use of specially formulated primers.
 4. Testing will not be required when joint sealant manufacturer is able to submit joint preparation data required above that are acceptable to Architect and are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- E. Product Testing: Provide comprehensive test data for each type of joint sealant based on tests conducted by a qualified independent testing laboratory on current product formulations within four (4) month period preceding date of Contractor's submittal of test results to Architect.
1. Test elastomeric sealants for compliance with requirements specified by reference to ASTM C 920. Include test results for hardness, stain resistance, adhesion and cohesion of elasticity at 100 percent strain, effects of heat aging, and effects of accelerated weathering.
- F. Preconstruction Field Testing: Prior to installation of joint sealants, field test their adhesion to joint substrates as follows:
1. Locate test joints where indicated or as directed by County.
 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 3. Test Method: Test joint sealants by hand pull method described below:
 - a. Install joint sealants in 60 inches (1500 mm) joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed Work. Allow sealants to cure fully before testing.
 - b. Make knife cuts horizontally from one side of joint to the other followed by 2 vertical cuts approximately 2 inches (50 mm) long at side of joint and meeting horizontal cut at top of 2-inch (50-mm) cuts. Place a mark 1 inch (25 mm) from top of 2-inch (50-mm) piece.
 - c. Use fingers to grasp 2-inch (50-mm) piece of sealant just above 1-inch (25-mm) mark; pull firmly down at a 90-degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing

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adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.

4. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
5. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.03 Submittals

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data from manufacturers for each joint sealant product required.
 1. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
- C. Manufacturer's Material Safety Data Sheets: Submit with product data required under Section 01300.
- D. Samples for initial selection purposes in form of manufacturer's standard beam samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- E. Samples for verification purposes of each type and color of joint sealant required. Install joint sealant samples in 1/2-inch (13mm) wide joints formed between two 6-inch (150-mm) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- F. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.

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- G. Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and

recommendations for primers and substrate preparation needed to obtain adhesion.

- H. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified.
- I. Preconstruction field test reports indicating which products and joint preparation methods demonstrate acceptable adhesion to joint substrates.

1.04 Delivery, Storage and Handling

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi component materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.05 Project Conditions

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 - 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

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PART 2 - PRODUCTS

2.01 General

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealants to comply with the following:
 - 1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

2.02 Polyurethane Sealant

- A. Manufacturers' standard two (2) part, non-sag polyurethane rubber sealant conforming to ASTM C-920, Type M, Grade NS, Class 25, use NT, M, G, A and 0. Sealant to have 25% extension and 25% compression and to have a service temperature range of -20 to +180.
- B. Products: Subject to compliance with requirements, provide one of the following:
 - 1. "Dynatrol II" by PecoraCorp.
 - 2. "Chem-Calk 500" by Bostik Construction Products.
 - 3. "Dualthane" by W.R. Meadows

2.03 Joint Sealant Backing

- A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
 - 1. Flexible, compressible, closed-cell polyethylene foam of not less than ten (10) psi compression deflection (25%); except provide higher compression deflection strength as may be necessary to withstand installation forces and provide proper support for sealants. Polyethylene foam to be non-absorbent to liquid water and gas and non-outgassing in un-ruptured state.
 - 2. Bond Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer to prevent sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self adhesive tape where applicable.

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2.04 Miscellaneous Materials

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Marking Tape: Non staining, non absorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 Examination

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.02 Preparation

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.

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3.03 Installation

- A. General: Comply with joint sealant manufacturer's printed installation

instructions applicable to products and applications indicated, except where more stringent requirements apply.

- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials applications, and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
 - 1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.

3.04 Cleaning

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.05 Protection

- A. Protect joint sealants during and after during period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

[END OF SECTION]

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SECTION 15422
ROOF DRAINS

PART 1 - GENERAL

1.01 Description of Work

A. This Section includes the following:

1. Clamping Rings
2. Clamping Ring Fasteners
3. Dome Strainer
4. Flat Strainer

B. Related Work Described Elsewhere:

1. Rough Carpentry - Section 06100
2. Vapor Barriers - Section 07190
3. Roof and Deck Insulation - Section 07240
4. Asphalt Shingle Roofing - Section 07311
5. Built-Up Bituminous Roofing - Section 07510
6. Single-Ply Sheet Roofing - 07530
7. Traffic Topping - Section 07570
8. Metal Flashing and Trim - Section 07620
9. Gutters and Down spouts - Section 07631
10. Gravel Stops - Section 07660
11. Sealants and Caulking - Section 07951

1.02 Submittals

- A. Product Data: For each type of product specified, include details of construction relative to materials, dimensions of individual components, profiles and finishes.
- B. Shop Drawings: Indicate layout, joining, profiles, accessories, anchorage, flashing connections, and relationship to support structure and to adjoining roof and wall construction.
- C. Samples for Initial Selection: Manufacturer's sample finishes showing the full range of colors and textures available for units with factory-applied color finishes.
- D. Contractor is to verify size of connecting pipe in order to size the proper free strainer area called for above.

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PART 2 - PRODUCTS

2.01 Roof Drains

- A. Clamping Ring: Coated cast iron, non puncturing type compression ring with integral, notched gravel stop and dome locking receiver.
- B. Dome Strainer: Coated cast aluminum type, and cast iron flat at paved areas, with narrow vertical slotted openings, bayonet locking flange, secured with vandal resistant fasteners.

1. Minimum Dome Strainer Opening Area:

<i>Connecting Pipe Sized (in. nominal)</i>	<i>Dome Strainer Free Area (sq. inches)</i>
2	18
3	25
4	36
5	50
6	70

- C. Acceptable Drain Series: Josam 21500, Smith 1010, Wade W3000, and Zurn Z100.
- D. Contractor is to verify size of connecting pipe in order to size proper free strainer area called for above.

2.02 Fasteners

- A. Corrosion Resistant Fasteners: Brass, bronze or Type 302 or 304 Stainless Steel bolts acceptable.
- B. Vandal Resistant Fasteners: Alien or Torx head, both with center post.
- C. Anti-Seize Lubricant: Never-Seez, by Bostik Chemical Group, Broadview, IL; Molycote 1000, by Dow Coming Corp. Of Midland, MI: Anti-Seize Lubricant, by Loctite Corp., Newington, CT.

PART 3 - EXECUTION

3.01 Installation

- A. Install the Work of this Section in accordance with manufacturer's printed installation instructions, unless otherwise specified.

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- B. Coordinate clamping ring installation with roofing work.
- C. Fasteners:

1. Coat bolt threads with anti-seize lubricant before final installation.
2. Secure external components in place with vandal resistant fasteners or devices that cannot be removed without special tools.
3. Special tools:
 - a. Tools for Vandal Resistant Fasteners: One for each type and size.

[END OF SECTION]

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