PROJECT MANUAL
FOR
UPPER AND LOWER ROOFS REPLACEMENT
AT
HALL-ATWATER
AT
WESLEYAN UNIVERSITY
MIDDLETOWN, CT

WJE NO. 2014.1717.2
March 10, 2017

Prepared by

WISS, JANNEY, ELSTNER ASSOCIATES, INC.
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END OF SECTION
SECTION 00 02 00

INVITATION TO BID

Ms. Roseann Sillasen
Associate Director of Construction Services
Wesleyan University
170 Long Lane
Middletown, CT 06459

will receive bids for:

Upper and Lower Roofs Replacement
Hall-Atwater
Wesleyan University
Middletown, Connecticut

until: 11:00 a.m. local time April 3, 2017.

Providing all labor, materials, equipment and other items necessary to:

- Remove existing gravel, built-up roofing, insulation, flashings, drain bowls, and all appurtenances not scheduled to remain. Existing vapor retarder, if present and in good condition, shall remain.

- Install new drains, adhesively applied insulation and cover board, and torch applied modified bitumen roof assembly. All new flashings and transitions needed to provide a complete, functioning, and warrantable assembly must also be provided.

**Project Schedule:** Due to the operation of the facility, all work must be substantially during the summer recess.

Copies of the Bid Documents are available for review and may be obtained from the Architect/Engineer's office of Wiss, Janney, Elstner Associates, Inc., Two Trap Falls Road, Suite 502, Shelton, Connecticut 06484 (203) 944-9424.

Bidders must submit their bids in accordance with Instruction to Bidders.

The Owner will privately open and review the bids after the specified closing time. The Owner reserves the right to waive any irregularities and reject any or all bids.

END OF SECTION
SECTION 00 10 00

INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 BID DOCUMENTS

A. Bid Documents will be disseminated via email; they also are available to Bidders for review and may be obtained from the Architect/Engineer's office:

WISS, JANNEY, ELSTNER ASSOCIATES, INC.
Two Trap Falls Road, Suite 502
Shelton, Connecticut 06484

B. Bid Documents will not be available for distribution to sub-bidders.

1.2 EXAMINATION OF DOCUMENTS, SITE AND LOCAL CONDITIONS

A. The Bidders shall carefully examine and familiarize themselves with the Bid Documents. No extra compensation will be paid at a later date for lack of knowledge or neglect on the contractor's part.

B. The Bidders shall visit the site and fully acquaint themselves with conditions as they exist.

C. Bidders shall immediately report to the Architect/Engineer any errors, inconsistencies or ambiguities discovered.

1.3 INTERPRETATIONS OR CORRECTION OF BID DOCUMENTS DURING BIDDING

A. Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Architect/Engineer. No inquiry received within five (5) days of the date fixed for opening of the bids will be given consideration.

B. Any interpretation, correction or change of the Bidding Documents, if such is issued, will be sent as promptly as is practicable to all persons to whom the Drawings and Specifications have been issued. All such addenda shall become part of the Contract Documents. Failure of the Architect/Engineer to send or any Bidder to receive any such interpretation, shall not relieve any Bidder from any obligation under his Bid as submitted.
C. Interpretations, corrections or changes of the Bidding Documents made in a manner other than an addendum will not be binding, and Bidders shall not rely upon such interpretations, corrections or changes.

1.4 TIME OF COMPLETION

A. Time of completion of the project is of extreme importance to the Owner and will be considered in the award of a contract. Bidders shall complete work during the times outlined in the Invitation to Bid. The Bidder shall state on the Bid Form the number of calendar days he/she will require to substantially complete the project. Failure of the Contractor to substantially complete the project in the number of days indicated on his Bid Form, plus any adjustments authorized by the Owner in writing, will be considered a substantial violation of the Contract.

1.5 PREPARATION OF BIDS

A. Each Bid must be submitted on the form indicated in Section 00 30 00. The Bid Form may be obtained from the Architect/Engineer.

B. The Bid Form shall be submitted in a sealed envelope addressed as indicated below. Also, the outside of the envelope shall bear the designations, "BID PROPOSAL, the name of the project, and the name of the Bidder and the Bidder's address. In the event the Bid is forwarded by mail or messenger, the sealed envelope containing the Bid shall be enclosed in another envelope addressed to the Bid recipient at the designated location for opening of the Bid.

C. Bids shall be addressed to:

Ms. Roseann Sillasen  
Associate Director - Construction Services  
Wesleyan University  
170 Long Lane  
Middletown, CT  06459

D. Bids must be received by the above-noted addressee prior to the specified closing time. Bids received after this time may be returned unopened.

1.6 CONSIDERATION OF BIDS

A. The Owner will privately open and review the Bids after the specified closing time.

B. The Owner reserves the right to waive any irregularities and reject any or all Bids.
C. The Bidder shall also submit a properly executed Bid Form. All proposed subcontractors shall also be included.

D. A Pre-Bid Conference will be held at the building. Bidders will be notified of a time and specific location. Your company representative must be present and should be familiar with the project and any bid documents received and have any questions or comments ready for review at this time. Subcontractors with questions pertaining to interpretation or clarification of the bidding documents are invited to attend. The Owner and the Architect/Engineer will be represented. The Pre-Bid Conference is mandatory. Bidders not attending Pre-Bid Conference subject their bid to disqualification.

1.7 PERFORMANCE BOND AND MATERIAL PAYMENT BOND

A. Each Bidder shall qualify for a Performance Bond and Material Payment Bond each equaling 100 percent of the Bid. The costs associated in providing these bonds shall be indicated in the appropriate area of the Bid Form.

B. The Performance Bond must be in a standard form, such as AIA Document A312, from a satisfactory Surety made payable to the Owner.

C. The Payment Bond must be in a standard form, such as AIA Document A312, from a satisfactory Surety made payable to the Owner.

1.8 AWARD OF CONTRACT

A. A Contract shall be deemed as having been awarded when a formal notice of award has been duly served.


END OF SECTION
SECTION 00 30 00

BID FORM

BID TO: Hall-Atwater Upper and Lower Roofs Replacement
Wesleyan University
c/o Roseann Sillasen
170 Long Lane
Middletown, CT 06459

Submit bid no later than April 3, 2017 at 11:00 a.m.

BID FORM:

______________________________________________
(Bidder's Name)

______________________________________________
(Bidder's Address)

DATE: 

______________________________________________

THE UNDERSIGNED

1. Acknowledges receipt of:

A. Project Manual for:
   1. Upper and Lower Roofs Replacement at:
      Hall-Atwater
      Wesleyan University
      52 Lawn Avenue
      Middletown, CT 06459
      Dated: March 10, 2017

   2. Wesleyan Project Manual - Divisions 00 and 01, as provided by Wesleyan University.

B. Drawings: A-000, A-100 through A-101, A-200 through A-204

C. Addenda: No._______ Dated: ________________
   No._______ Dated: ________________
   No._______ Dated: ________________
   No._______ Dated: ________________

2. Has visited and examined the site of Work and has examined the Bidding Documents for the Work.

Hall-Atwater - Wesleyan University 00 30 00 - 1 Bid Form
WJE No. 2014.1717.2 March 10, 2017
3. Agrees:
   A. To hold the Bid Proposal open for not less than 45 days after the scheduled Bid Opening Date.
   B. To execute an Agreement, Performance Bond and Payment Bond (if required), and provide proof of insurance coverage with the Owner for the entire Work in accordance with the Contract Documents within seven (7) days after notice of award.

4. General Condition Costs
   A. Costs on the project, such as permit fees, mobilization, demobilization, scaffolding costs, fixed cost rentals, or fixed costs shall be considered General Condition Costs, and shall be included in all unit and lump sum prices.

5. Changes in the Work
   A. To address changes in the work, either an addition or deletion, not indicated under unit costs by the Contract Documents and Specifications, and upon written instructions of the Owner, the following prices shall prevail in accordance with the General Conditions.
      1. Labor - including all profit and overhead. All trades at their prevailing hourly rate plus ________________ percent (______ %) for profit and overhead.
      2. Material costs at cost plus _____FIVE______ percent (____ %) for profit and overhead.

6. Taxes
   A. The undersigned agrees that the Grand Total price includes all taxes applicable to the work of whatever character or description, which are levied by federal, state or municipal governments.

7. Rights Reserved
   A. In submitting this Proposal, the undersigned understands that the Owner reserves the right to reject any or all proposals submitted, in whole or in part, to waive any information therein, and to accept any proposal, as the Owner may consider to be in his/her interests.

8. Base Bid
   A. For all Work required to complete the project in its entirety, the contractor bids:
      GRAND TOTAL IN WORDS _______________________________ Dollars ($____________________)
      This bid includes all labor, materials, services and equipment necessary for completion of the Work specified.
   B. The contractor estimates he/she substantially complete the project in _____ days from award of contract.
C. The contractor shall provide the following roof membrane manufacturer and system specified in Section 07 50 30.

9. Alternates

A. Alternate No. 1: Install new vapor retarder at lower roof
B. Alternate No. 2: Remove and replace penthouse roof

10. UNIT PRICES

The unit prices included in the following schedule will be used for adjustments to the scope of work indicated on the drawings. The unit prices shall include labor and material costs and costs associated with required access.

**UNIT PRICE SCHEDULE**

<table>
<thead>
<tr>
<th>WORK ITEM</th>
<th>DESCRIPTION</th>
<th>UNIT</th>
<th>ADD/DEDUCT UNIT PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drain bowl replacement</td>
<td>Ea.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Additional walk pads</td>
<td>Ea.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Increase vent stack heights 6” minimum</td>
<td>Lump Sum</td>
<td></td>
</tr>
</tbody>
</table>

11. If the Owner exercises his/her right to require Bonds and Certificates as stipulated in the Contract Documents, add the following amount to the Base Bid:

   ____________________________________________________________ Dollars (__________)

12. Agrees to the following conditions:

A. Expedite all submittals and obtain any and all permits required to perform this Work.
B. Work at least five full working days per week, when weather permits.
C. Work hours to be as allowed by local ordinance.
D. Due to the operation of the facility, the entire project including punchlist must be completed prior to the end of summer recess.

13. Bidder's Subcontractors:
The Contractor submits for consideration the following subcontractors as appropriate, who are incorporated into the Bid Proposal and are intended to be used to complete this project.

<table>
<thead>
<tr>
<th>Work</th>
<th>Subcontractor</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>Sheet Metal</td>
<td></td>
</tr>
<tr>
<td>Demo</td>
<td></td>
</tr>
<tr>
<td>Abatement</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

14. Signature of Bidder

A. Firm Name: ____________________________________________
B. Address: _____________________________________________
C. Signatory: ___________________________________________
D. Title: _______________________________________________
E. Date: ________________________________________________
F. Witness: _____________________________________________

15. Bidders Resume

A. Provide the following information for at least three projects completed within the last five (5) years which are similar in scope and size as this project. Use additional sheets as/if required:

1. Client: ______________________________________________
   Structure: ___________________________________________
   Year Completed: ______________________________________
   Address: ____________________________________________
Contact and Phone:  

2. Client:  
Structure:  
Year Completed  
Address:  
Contact and Phone:  

3. Client:  
Structure:  
Year Completed  
Address:  
Contact and Phone:  

16. Contract  

A. If Undersigned is notified of acceptance of this Bid within 90 calendar days after due date of this Bid, he agrees to execute a standard AIA Document A101 (1997 Edition) – Standard Form of Agreement Between Owner and Contractor for the above work for the stated compensation.  

END OF SECTION
PART 1 GENERAL

1.1 AGREEMENT


PART 2 NOT USED

PART 3 NOT USED

END OF SECTION
SECTION 00 80 0

INDEX OF DRAWINGS

The following is the list of Drawings dated 10 March 2017, which are to be part of the Contract Documents.

A-000  Cover Sheet
A-100  Roof Plan
A-101  Taper Layout Plan
A-200  Roof Details
A-201  Upper Roof Details
A-202  Upper Roof Details
A-203  Lower Roof Details
A-204  Lower Roof Details

END OF SECTION
PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of this project consists of:

1. Removal of existing roofing, flashings, drains, blocking, and all other appurtenances to allow installation of all new work/materials noted in these plans and specifications

2. Clean, prime and otherwise prepare all existing substrates and surfaces to allow installation of new work/materials noted in these plans and specifications

3. Install new drains

4. Install new insulation, 2-ply SBS modified bitumen roof membrane assembly, and all necessary flashings, and miscellaneous materials as noted in these plans and specifications and as required by the material manufacturer to allow the specified warranty to be issued.

B. Contractor's Duties:

1. Except as specifically noted, provide and pay for:
   a. Labor, materials and equipment
   b. Tools, construction equipment and machinery
   c. Heat and utilities required for construction
   d. Other facilities and services necessary for proper execution and completion of the Work.

2. Secure and pay for, as necessary, for proper execution and completion of work, and as applicable at time of receipt of bids:
a. Permits
b. Government fees
c. Licenses.

3. Give required notices.

4. Comply with local codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of Work.

5. Promptly submit written notice to Architect/Engineer of observed variance of Contract Documents from legal requirements. It is not the Contractor's responsibility to make certain that drawings and specifications comply with codes and regulations.

   a. Propose appropriate modifications to Contract Documents for necessary changes.
   b. Assume responsibility for Work known to be contrary to such requirements, without notice.

6. Enforce strict discipline and good order among employees. Do not employ on Work:

   a. Unfit persons.
   b. Persons not skilled in assigned task.

1.2 CONTRACTS

A. This project will be constructed under a single contract under the direction of a single Contractor.

B. There shall be complete cooperation between Contractor and subcontractors to ensure satisfactory progress and performance of the Work.

C. The Owner reserves the right to award other contracts for additional work in connection with this project as required to install improvements, furnish, or equip the building.

1.3 WORK BY OTHERS

A. None anticipated.
1.4 WORK SCHEDULE AND SEQUENCE

A. The schedule of work hours at the jobsite shall be at the discretion of the Contractor to complete the Work within the time for substantial completion allowed in the Contract and within hours allowed by the Owner.

B. During the Work, the Contractor shall take all necessary precautions to avoid damaging the exterior paving, sidewalks, roofing, landscaping, walls and glass, as well as any personal property of the Owner. Any damage shall be promptly repaired by the Contractor at his/her own expense.

C. The Contractor shall restrict placement of equipment and storage of materials to those areas designated on the drawings, or as otherwise directed by the Owner.

1.5 OWNER-FURNISHED ITEMS

A. For construction purposes only, water and electricity may be taken from the existing building at locations designated by the Owner. All extensions or modifications required to provide water and electricity are to be done by the Contractor by licensed contractors, at no expense to the Owner.

1.6 ABBREVIATIONS

A. Reference to a technical society, institution, association, or governmental authority is made in the Specifications in accordance with the following abbreviations:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
</tr>
<tr>
<td>APA</td>
<td>Engineered Wood Association</td>
</tr>
<tr>
<td>ASLC</td>
<td>American Lumber Standard Committee</td>
</tr>
<tr>
<td>ASTM</td>
<td>ASTM International</td>
</tr>
<tr>
<td>AWPA</td>
<td>American Wood Preservers Association</td>
</tr>
<tr>
<td>BIA</td>
<td>Brick Industry Association</td>
</tr>
<tr>
<td>FM</td>
<td>Factory Mutual Global</td>
</tr>
<tr>
<td>FS</td>
<td>Federal Standard</td>
</tr>
</tbody>
</table>

Hall-Atwater - Wesleyan University 01 01 00 - 3 Summary of Work

WJE No. 2014.1717.2 March 10, 2017
NFPA      National Forest Products Association
NRCA      National Roofing Contractor’s Association
SFPA      Southern Forest Products Association
SMACNA    Sheet Metal and Air Conditioning Contractor's National Association.
UL        Underwriters Laboratories

END OF SECTION
PART 1 GENERAL

1.1 REQUIREMENTS INCLUDE

A. Prime Contractor (Contractor):
   1. Attend specified meetings
   2. Ensure attendance of subcontractors and suppliers when specified or directed.

1.2 PRECONSTRUCTION MEETING

A. The Contractor will schedule a preconstruction meeting within ten (10) business days after Notice of Award and a roofing kick-off meeting five (5) business days prior to application of roofing materials.

B. Attendance: Contractor, subcontractors, other contractors, manufacturer's representatives and Owners Representative.

C. Agenda:
   1. Designation of responsible personnel
   2. Emergency procedures, contact people and telephone numbers
   3. Relation and coordination of contractors
   4. Discuss list of contractors
   5. Tentative construction schedule
   6. Critical work sequencing
   7. Submittals, shop drawings, project data and sampling
   8. Use of Premises:
      a. Office and storage areas
      b. Owner's requirements
      c. Staging areas.
   9. Major equipment deliveries and priorities
   10. Processing of field decisions and Change Orders.
   11. Security procedures
   12. Housekeeping procedures
   13. Schedule of progress and coordination meetings, if necessary.

1.3 PROGRESS AND COORDINATION MEETINGS

A. Hold weekly meetings as progress of work dictates.

B. Location of Meetings: At the offices of the Owner's representative at the job site, or as otherwise designated.

C. Attendance: Contractor, subcontractor, other contractors, suppliers, manufacturer's representatives and other parties as required or requested by the building owner.

D. Minimum Agenda:
1. Review work progress since last meeting; review schedule
2. Review applications for payment.
3. Note field observations, problems and decision.
4. Identify problems which impede planned progress
5. Review status of submittals
6. Develop corrective measures and procedures, if necessary
7. Coordinate projected progress with other contractors.

END OF SECTION
SECTION 01 30 00
SUBMITTALS

PART 1 GENERAL

1.1 DESCRIPTION

A. Work includes submission of submittals to the Architect/Engineer as required by the Specifications and specified therein.

1.2 DEFINITIONS

A. Shop Drawings: Shop drawings are original drawings prepared by Contractor, Subcontractor, Sub-subcontractor, supplier or distributor, which illustrate some portion of the Work; showing fabrication, layout, setting or erection details.
   1. Prepared by qualified detailer
   2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
   3. Minimum sheet size 8 1/2 in. by 11 in.

B. Project Data:
   1. Manufacturer's standard schematic drawings:
      a. Modify to delete information which is not applicable to project
      b. Supplement standard information to provide additional information to project.
   2. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.
      a. Clearly mark each copy to identify pertinent materials, products or models.
      b. Show dimensions and clearances required.
      c. Show performance characteristics and capacities.
      d. Provide Safety Data Sheets (SDS) where required.

C. Samples: Physical samples to illustrate materials, equipment or workmanship, and to establish standards by which complete work is judged.
   1. Office Samples: Of sufficient size to clearly illustrate:
      a. Functional characteristics of product of materials, with integrally related parts and attachment devices
      b. Full range of color samples
      c. After review, samples may be used for construction of the project.

D. List of Manufacturers
   1. Tabulate list of each Specification Section
   2. For products specified under reference standards, include with listing of each product:
      a. Name and address of manufacturer
      b. Trade name
      c. Model or catalog designation
      d. Manufacturer's data.
         1) Performance and tests data.
   3. Reference standards
1.3 SUBMITTAL REQUIREMENTS

A. At time specified, submit all required submittals to Architect/Engineer with a copy of the transmittal letter to the Owner.

B. Submit the quantity of documents required for return plus two (2) copies; one copy will be retained by the Architect/Engineer, one copy will be forwarded to the Owner. If transmitting copies electronically, only one is required.

C. Accompany submittals with transmittal letter containing:
   1. Date
   2. Project title and number
   3. Contractor's name and address
   4. The number of each shop drawing, product data and sample submitted
   5. Notification of deviations from Contract
   6. Other pertinent data including lead time and impact on project schedule.

D. Submittals shall include:
   1. Date and revision dates
   2. Project title and number
   3. Identification of product or material
   4. Field dimensions, clearly identified as such
   5. Specification Section and page number
   6. Applicable Standards, such as ASTM number or Federal Specification
   7. A blank space 3 in. x 3 in., for Architect/Engineer's stamp
   8. Identification of deviation(s) from the Contract Documents
   9. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field conditions and measurements, and compliance with Contract.

E. The Architect/Engineer will check and review, with reasonable promptness, submittals only for conformance with the design concept of the project and compliance with the information given in the Contract Documents. The revised copies will be returned to the Contractor and any further distribution required will be the responsibility of the Contractor.

F. Samples shall be of sufficient size to show general visual effect. When samples must show range of color, texture, finish, graining, or other properties, submit in sets of three showing the full scope of this range. Each sample shall bear identifying labels stating project name, material, manufacturer, and location on project. Each sample or set of samples shall be accompanied by a transmittal.

G. Samples will be reviewed for conformance with only the design intent and specified approvals. Conformance to all requirements of the Contract Documents remains the responsibility of the Contractor.

H. Samples will be reviewed and the Contractor notified in writing if the sample conforms to the design concept and requirements of the Contract Documents.

I. Samples will be retained by the Architect/Engineer and will serve as the standard by which all material delivered to the job will be judged.
J. Certain samples may be incorporated into the Work when approved by the Architect/Engineer or may be retrieved by the Contractor at the completion of the Work where so stated in the Specifications.

1.4 RESUBMISSION REQUIREMENTS

A. Shop Drawings:
   1. Revise initial drawings as required and resubmit as specified for initial submittal.
   2. Indicate on drawings all changes which have been made other than those requested by Architect/Engineer.
   3. In the event the submittal is returned stamped "Amend and Resubmit or Rejected," a revised submittal of the shop drawings shall be resubmitted to the Architect/Engineer for review as above.
   4. Drawings received by the Architect/Engineer which do not bear the Contractor's stamp of approval or contain numerous errors indicating a superficial check on the part of the Contractor will be returned for resubmission and will not be reviewed by the Architect/Engineer. The Architect/Engineer's review of drawings or schedules shall not relieve the Contractor of the responsibility for deviations from the Contract Documents, unless he/she has in writing called the Architect/Engineer's attention to such deviations at the time of submission and secured his written approval, nor shall it relieve him/her of responsibility for errors of any kind.
   5. Shop drawings bearing the stamp "No Exceptions Taken" or "Make Corrections Indicated" and bearing the Architect/Engineer's signature shall be kept at the jobsite, and the Architect/Engineer will order the removal of any not so noted.

B. Product Data and Samples: Submit new data and samples as required for initial submittal.

C. Make resubmittal so as not to delay work. No extension of contract will be allowed for delays due to improper submittals.

1.5 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

A. The Architect/Engineer will distribute copies of submittals to the Owner.

B. The contractor shall distribute copies of submittals which carry the Architect/Engineer's stamp to:
   1. Contractor's file
   2. Jobsite file
   3. Record documents file
   4. Other Contractors
   5. Subcontractors
   6. Suppliers
   7. Fabricators.

1.6 CONTRACTOR RESPONSIBILITIES

A. Review shop drawings, product data and samples prior to submission.

B. Verify:
   1. Field dimensions
   2. Field construction criteria
3. Catalog numbers and similar data.

C. Coordinate each submittal with requirements of:
   1. The Work
   2. The Contract Documents
   3. The Work of other contractors.

D. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect/Engineer's review of submittals.

E. Notify Architect/Engineer, in writing at time of submissions, of deviations in submittals from Contract requirements, and adverse impact on the project schedule.

F. Contractor's responsibility for deviations in submittals from Contract Documents’ requirements is not relieved by Architect/Engineer's review of submittals.

G. Do not begin any work which requires submittals without having Architect/Engineer's stamp and initials or signature indicating approval.

H. After Architect/Engineer's review, make response required by the Architect/Engineer's stamp and distribute copies.

1.7 ARCHITECT/ENGINEER'S DUTIES

A. Review submittals with reasonable promptness (approximately 14 calendar days).

B. Review for:
   1. Design concept of Project
   2. Information given in Contract Documents.

C. Review of separate item does not constitute review of an assembly in which item functions.

D. Affix stamp, date and initials or signature certifying to review of submittal, and with instructions for Contractor response.

E. Return submittals to Contractor for response of distribution.

F. The Architect/Engineer will distribute copies of submittals to the Owner.

END OF SECTION
PART 1 GENERAL

1.1 REQUIREMENTS

A. All Bids shall be based upon providing all products exactly as specified.

B. Where, in the specifications, the materials, products or equipment of a certain manufacturer are indicated, it is done for the purpose of establishing a standard or required function, dimension, appearance and quality and is not intended to limit competition. Where "(or approved equal)" is stated, the Architect/Engineer shall be the approving party.

C. For products specified only by reference or performance standards, select any product which meets or exceeds standards, by any manufacturer, subject to the Architect/Engineer's approval.

1.2 SUBSTITUTIONS, BIDDER/CONTRACTOR OPTIONS

A. PRIOR TO BID OPENING: The Architect/Engineer will consider written requests to amend the Bidding Document to add products not specified provided such requests are received at least 7 calendar days prior to bid opening date. Requests received after that time will not be considered. When a request is approved, the Architect/Engineer will issue an appropriate addendum not less than five calendar days prior to bid opening date.

B. AFTER AWARD OF CONTRACT: No substitutions will be considered after Notice of Award except under one or more of the following conditions:
   1. Unavailability of specified products, through no fault of Contractor
   2. Subsequent information discloses inability of specified product to perform properly or to fit in designated space
   3. Manufacturer/fabricator refusal to certify or guarantee performance of specified product as specified
   4. When a substitution would be substantially to Owner's best interests.

1.3 SUBSTITUTION REQUIREMENTS

A. Submit the documents required to fully describe the requested substitution. Include in request:
   1. Complete data substantiating compliance of proposed substitution with Contract Documents
   2. For products:
      a. Product identification, including manufacturer's name and address.
      b. Manufacturer's literature:
         1) Product description
         2) Performance and test data
         3) Reference standards.
      c. Samples
      d. Name and address of similar projects on which product was used and date of installation.
   3. For construction methods:
a. Detailed description of proposed method
b. Name and address of similar projects on which product was used and date of installation.

4. Itemized comparison of proposed substitution with product or method specified
5. Data relating to changes in construction schedule
6. Identify:
   a. Other contracts affected
   b. Changes or coordination required.
7. Accurate cost data on proposed substitution in comparison with product or method specified.

B. In making request for substitution, Bidder/Contractor represents:
   1. He/she has personally investigated the proposed product or method and determined that it is equal or superior in all respects to that specified
   2. He/she will provide the same guarantee for substitution as for product or method specified
   3. He/she will coordinate installation of accepted substitutions into work, making all changes for work to be complete in all respects
   4. Cost data is complete and includes all related costs under his/her contract, but excludes:
      a. Costs under separate contracts
      b. Architect/Engineer's redesign
      c. Administrative costs of Architect/Engineer.
   5. Bidder/Contractor will assume full responsibility for all additional costs and expenses for Owner, Architect/Engineer, and other contractors.

C. Substitutions will not be considered when:
   1. They are indicated or implied on shop drawings or product data submittals without formal request submitted in accordance with Paragraph 1.03.
   2. Acceptance will require substantial revision of Contract Documents.

END OF SECTION
PART 1 GENERAL

1.1 CUTTING AND PATCHING

A. If the Project includes work that is affected by existing conditions, make adjustments in the Work as required to accommodate existing conditions, as directed by the Architect. Where products are to be installed in existing construction, perform cutting, removal of old products, installation of new products, rebuilding of adjacent construction, and other operations as required.
   1. Architect will issue prompt instructions when unanticipated conditions are encountered.
   2. If unanticipated conditions are such as to impose a hardship on Contractor as interpreted by Architect/Engineer, such as faulty structure that must be rebuilt, Architect/Engineer will issue Change Orders for approval by Owner. Work not in Contract Documents will not be ordered without Change Order for reasonable compensation.
   3. Make adjustments in the Work, other than those described in paragraph 2 above, without additional compensation.

B. "Cutting and patching" includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.
   1. Cutting and patching is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.
   2. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered to be "cutting and patching" under this definition. Drilling of holes to install fasteners and similar operations are also not considered to be "cutting and patching".
   3. "Demolition" and "Selective Demolition" are recognized as related-but-separate categories of work, which may or may not require cutting and patching as defined in this section; refer to "Demolition" and "Selective Demolition" sections of Division 2.

C. "Removals" includes disconnecting, physically relocating, or temporarily putting out of service existing items or assemblies which are in good condition, presently operating and otherwise functional at the time this Work is conducted, with the intent of protecting and storing for subsequent reinstallation at or near the original location.
   1. Items or assemblies scheduled under Selective Demolition for storage and future use are not "removals". Comply with specified crating and storage requirements.
   2. Salvageable products of demolition are not regarded as a "removal".

D. Other sections of these specifications describe specific cutting and patching, or removal requirements and limitations applicable to individual units of work.
E. Requirements for Structural Work: Do not cut and patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio. Prior to such work, obtain approval of Architect.

F. Do not remove equipment or assemblies without adequate gripping, stabilizing and lifting equipment. Verify that the path for removal has adequate structural capacity to support item being moved as well as the equipment to move it.

G. Visual Requirements: Do not cut and patch work exposed on the building's exterior or in its occupied spaces, in a manner that would, in the Architect's opinion, result in lessening the building's aesthetic qualities. Do not cut and patch work in a manner that would result in substantial visual evidence of cut and patch work. Replace work judged by the Architect to be cut and patched in a visually unsatisfactory manner.

H. If possible, retain the original installer or fabricator, or if not available, a recognized, experienced and specialized firm to cut and patch or remove work.

I. Use original shop drawings, manufacturers' instructions or similar authentic data prior to removing material or equipment.
   1. Confer with Owner's Administrative representative if removals affect University utility system. Schedule shut-downs well in advance.
   2. Obtain Owner’s approval before cutting into existing risers, mains, ductwork, etc.

J. Where prior approval of cutting and patching or removals is required, submit proposed procedures for this work well in advance of the time work will be performed and request approval to proceed. Include the following information in the submittal, as applicable:
   1. Describe nature of the work and how it is to be performed, indicating why cutting and patching cannot be avoided. Describe anticipated results of the work in terms of changes to existing work, including structural, operational and visual changes as well as other significant elements.
   2. List products to be used and firms including their qualifications, which will perform work.
   3. Give dates when work is expected to be performed.
   4. List utilities that will be disturbed or otherwise be affected by work, including those that will be relocated and those that will be out-of-service temporarily. Indicate how long utility service will be disrupted.
   5. When cutting and patching structural work, submit details and engineering calculations to show how additional reinforcement is integrated with original structure to satisfy requirements.
   6. Identify areas for test finishes, mock-ups or other full scale samples to establish the standards of the Work.

PART 2 PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

A. Except as otherwise indicated, or as directed by the Architect, use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal-or-better performance characteristics.
B. New Materials: As specified in individual Sections.

C. Match existing products and Work for patching and extending Work.

D. Determine type and quality of existing products by inspection and any necessary testing, and workmanship by use of existing as a standard. Presence of a product, finish, or type of work, requires that patching, extending, or matching shall be performed as necessary to make Work complete and consistent with the contiguous construction.

2.2 PRODUCTS FOR REMOVALS

A. Refer to the Section requiring Removal for specific product requirements. In general, use covers, plugs, caps or other protective measures which are chemically and electrolytically compatible to exclude contaminants from entering piping, building cavities or bond surfaces.

PART 3 EXECUTION

3.1 INSPECTION

A. Before cutting, examine the surfaces to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

1. Meet at the work site with all parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict between the various trades. Coordinate layout of the work and resolve potential conflicts before proceeding with the work.

2. Investigate and confirm the location of concealed services. Make probe holes prior to substantial cutting.

3.2 PREPARATION

A. Provide temporary support of work to be cut or removed.

B. Cut, move, or remove items as necessary for access to Work; replace and restore at completion.

1. Protect other work during Work of this Section to prevent damage. Provide protection from adverse weather conditions of that part of the project that may be exposed during cutting and patching operations.

2. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

C. Take precaution not to cut existing pipe, conduit or duct serving the building but scheduled to be relocated until provisions have been made to bypass them.

D. Whenever possible, employ the installing mechanics for cutting or disassembly. When unavailable, use journeymen skilled in such work.

E. Make cuts neatly. Use saws wherever possible. Do not use percussion tools without prior approval. When cutting monolithic, structural materials such as concrete, core-bore corners to receive termination of saw-cut. Do not overlap cuts or extend cut beyond the limit of the intended opening.
F. Remove material in easily handled units.

G. Layout cuts and prepare openings consistent with good installation practices. Plan for use of entire masonry units, full boards, or other whole components to facilitate restoration according to natural or customary joint lines.

H. Remove unsuitable material not marked for salvage, such as rotted wood, rusted metals, and deteriorated masonry and concrete; replace materials as specified for finished Work.

I. Remove debris and abandoned items from area and from concealed spaces.

J. Prepare surfaces and remove surface finishes to provide for proper installation of new Work and new finishes.

K. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity. Insulate ductwork and piping to prevent condensation in exposed areas.

3.3 INSTALLATION

A. Coordinate work to expedite completion sequentially and to accommodate Owner occupancy.

B. Install products for patching as specified in individual Sections.

C. Installation shall be complete in all respects, including operational mechanical, electrical, and related systems.

3.4 TRANSITIONS

A. Where new Work abuts or aligns with existing, make a smooth and even transition. Patched Work shall match existing adjacent work in texture and appearance.

B. When finished surfaces are cut so that a smooth transition with new Work is not possible, terminate existing surface along a straight line at a natural line of division and confer with Architect.

3.5 REPAIR OF DAMAGED SURFACES

A. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.

B. Repair substrate prior to patching finish.

3.6 FINISHES

A. Finish surfaces as specified in individual Sections to match adjacent surfaces.

B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest corners, edges or intersections with contrasting material.

END OF SECTION
SECTION 01 78 30
WARRANTIES AND BONDS

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Preparation and submittal.
B. Time and schedule of submittals.

1.2 RELATED SECTIONS
A. Contract for Construction: Performance bond and labor and material payment bonds, warranty, and correction of work, if requested.
B. Individual Specification Sections: Warranties required for specific Products or Work.

1.3 FORM OF SUBMITTALS
A. Bind in commercial quality 8-1/2 x 11 in. three D side ring binders with durable plastic covers.
B. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor; and name of responsible company principal.
C. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of Product or work item.
D. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

1.4 PREPARATION OF SUBMITTALS
A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
B. Verify that documents are in proper form, contain full information, and are notarized.
C. Co-execute submittals when required.
D. Retain warranties and bonds until time specified for submittal.
1.5 TIME OF SUBMITTALS

A. Make submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.

B. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

1.6 SCHEDULE OF SUBMITTALS

A. Performance and Payment Bond - Section 00 10 00, Section 00 30 00 and Section 00 40 00 (if requested by the Owner).

B. Contractor’s Guarantee - See individual specification sections.

C. Manufacturer’s Guarantee - See individual specification sections.

END OF SECTION
SECTION 02 08 30

DEMOLITION FOR NON-FRIABLE ASBESTOS ROOF REMOVAL

PART 1 GENERAL

1.1 WORK INCLUDES

A. Remove and dispose of existing roofing layers, including non-friable asbestos-containing materials in the existing roof membrane flashings. Asbestos-containing materials (ACM) are present on the building. Descriptions of roofing materials that are ACM will be outlined in the Owner ACM report.

B. By Owner
   1. Sign waste shipment record.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01010 - Summary of Work

B. Section 02050 - Demolition, Cutting and Patching

1.3 REGULATORY REQUIREMENTS

A. Prior to start of work, the Contractor must prepare and submit all filings, notifications, etc., required by all city, state and federal regulatory agencies having jurisdiction. Including providing an asbestos report performed by a Connecticut certified testing professional.

B. The Contractor shall comply with all city, state and federal rules, laws and requirements including but not limited to:
   1. NESHP – National Emissions Standards for Hazardous Air Pollutants
   2. OSHA – Occupational Safety and Health Administration
   3. Connecticut Department of Labor
   4. Connecticut Department of Environmental Protection

1.4 EXISTING CONDITIONS

A. Existing asbestos-containing materials will be outlined in the Owner ACM report.

B. Work Sequence: Prior to undertaking the roof replacement work specified within this Contract, the Contractor shall remove the existing roofs, including the asbestos-containing materials and install the specified roofing system or vapor retarder specified in Section 07 50 30 - Modified Bitumen Roofing.

1.5 QUALITY CONTROL

A. Air Monitoring:
1. Any air monitoring that may be required shall be conducted by an independent air sampling professional (ASP) employed by the Contractor to ensure that no employee is exposed to an airborne concentration of asbestos in excess of city, state or federal limits.

1.6 SUBMITTALS

A. Submit prior to beginning work.
   1. Plan of Action: Submit a detailed plan of the procedures proposed for use in complying with the regulation included in this specification. The plan shall include the location and layout of the sequencing of asbestos work, the interface of trades involved in the performance of the work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan, including location of approved disposal site, and a detailed description of the methods to be employed to control fiber release. Expand upon the use of any portable HEPA ventilation system, isolating the building’s HVAC system, method of removal to prohibit visible emissions in work area, and packaging of removed (loose) asbestos debris. The plan must be approved by the Owner’s Representative prior to commencement of work. A complete work schedule shall be submitted prior to beginning of work. Schedule shall be subject to approval by the Owner’s Representative.
   2. Make all submittals as required by law to the governing bodies.

1.7 WORK SEQUENCE

A. Do not remove existing roofing or flashing when precipitation is imminent
B. Do not remove more existing material than can be replaced with permanent roofing or the vapor retarder by the end of the work day.
C. Coordinate demolition and roof removal operations with new installation specified in Section 02 42 00 – Selective Demolition.
D. Conduct demolition and removal operations in a manner to minimize traffic over newly installed areas.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 PREPARATION

A. Shut down ventilation system and protect rooftop ventilation system intakes and exhausts as required. Coordinate with the Owner.
B. Protect existing items not indicated to be demolished.
C. Restricted Area:
   1. Establish a restricted area in all work areas where non-friable roofing ACM is to be removed. Post and limit access to the restricted area to authorized persons.
2. Allow no eating, drinking, smoking, tobacco or gum chewing or application of cosmetics.

3.2 NON-FRIABLE ASBESTOS REMOVAL

A. Remove all designated roofing materials in a careful manner.
B. Conduct air sampling.
C. Transport of ACM materials through the building is prohibited.
D. Legally dispose all materials in compliance with all city, state and federal laws, rules and regulations.

3.3 COORDINATION

A. Coordinate demolition and removal operations with new installation specified in Division Seven Specifications.
B. Do not remove more roofing than can be replaced with new materials and made watertight by the end of the work day.

3.4 CLEANUP

A. Upon completion of work, leave area in clean condition.

END OF SECTION
SECTION 02 11 00
SITE RESTORATION

PART 1 GENERAL

1.1 DESCRIPTION

A. Repair and/or replace areas of the site damaged during construction operations including, but not limited to canopies, landscaping, sidewalks, plaza, curbs, pavements, site furnishing, lighting fixtures, existing roofing, windows, etc., immediately after completion of all operations in that area. Repairs must, as a minimum standard, be equal to or exceed the condition which existed prior to the start of work under this Contract, in accordance with the requirements of General Conditions of the Contract and completely coordinated with the work of all other trades.

1.2 QUALITY ASSURANCE

A. Qualifications:
   1. Contractor shall employ subcontractors and/or tradesmen with a minimum of two (2) years experience in performing the work required.

1.3 SUBMITTALS

A. The Contractor shall submit to the Owner and Architect/Engineer for approval three (3) copies of a statement detailing the restoration work required.

   B. The statement shall as a minimum contain the following:
      1. Description of work
      2. Location and quantity of work
      3. Materials and standard for workmanship
      4. Schedule of operations.

   C. Approval of this statement by the Owner and/or Architect/Engineer shall not constitute approval of methods or materials. No work shall proceed until the Owner and/or Architect/Engineer has approved the statement.

PART 2 PRODUCTS

2.1 PAVING AND SURFACING

A. Replacement of all damaged paving, plaza, walks curbs and other surfacing on the site shall match the adjacent material to remain in color, shape, texture and durability.

2.2 LANDSCAPING

A. The Contractor shall guarantee the landscaping work against defects in materials and workmanship in accordance with the General Conditions, except that the guarantee period shall be one (1) planting season beyond the date of substantial completion.
1. This guarantee includes furnishing new plants as well as labor and materials for installation of replacements. All replacement plants shall be guaranteed and maintained for a period of one (1) year. Replacement stock must meet specifications and quality of original stock.

2. Contractor will not be held responsible for damages to or loss of plants caused by fire, flood, lightning storms, freezing rain, winds over 60 miles per hour, or vandalism.

3. Inspection of the planting will be made jointly by the Contractor and Architect/Engineer at the completion of planting. All plants not in a healthy, growing condition shall be removed and replaced with plants of like kind, size and quality as originally specified before the close of the next planting season.

4. At the end of the guarantee period, the Contractor shall remove all guying, staking, wrapping, saucers and mulch from the site.

B. Plant materials shall be replaced with the same species and size.

2.3 ROOFING

A. Replacement and/or repair of existing roofing scheduled to remain shall be performed by a manufacturer approved applicator and shall include any such repair and/or replacements determined necessary to bring the roof to its original state. This may also include removal and replacement of wet or moist insulation. These repairs will be determined by the Architect/Engineer and the roof membrane manufacturer.

PART 3 EXECUTION

3.1 PAVING AND SURFACING

A. Means and methods for the installation of replacement pavings, plaza, walks, curbs and other surfacing shall be in accordance with manufacturer's instructions, the project specifications and local construction standards for the type of work performed and shall be subject to the approval of the Owner and Architect/Engineer prior to the start of work.

3.2 LANDSCAPING

A. Plantings shall be set in appropriate pits, backfilled, mulched, guyed, staked or otherwise protected and installed in accordance with local construction standards for the type of plantings and subject to the approval of the Owner and Architect/Engineer prior to the start of Work.

3.3 ROOFING

A. Prior to commencing roof repairs, the contractor shall prepare a scope of work including details and specifications to the roof membrane manufacturer and Architect/Engineer for review.

B. The contractor’s work shall comply with the roof membrane manufacturer’s instructions and installation details. If such information is not available, the contractor shall comply with NRCA and SMACNA instructions and installation details.

END OF SECTION
PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: General administrative and procedural requirements for demolition and removal of existing roofing materials and related components.

1.2 REFERENCES

A. Definitions:
   1. Existing to remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
   2. Remove: Detach items from existing construction and legally dispose of off-site, unless indicated to be removed and salvaged or removed and reinstalled.
   3. Remove and reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
   4. Remove and salvage: Detach items from existing construction and deliver to Owner ready for reuse.

1.3 SUBMITTALS

A. Submit, prior to beginning demolition work, documentation of existing conditions of adjoining construction, including finish surfaces, which might be misconstrued as damage caused by demolition activities.

B. Submit identification codes and inventory of materials to be salvaged or reinstalled.

C. Permits and notices authorizing demolition.

D. Permits for transporting and disposing of debris.

1.4 QUALITY ASSURANCE

A. Codes: Conform to requirements and codes of the governing authorities.

B. Permits: Obtain and pay for all permits and fees for demolition, protection of public and property, and transportation and disposal of debris.

C. Certification: The Contractor shall issue a written certification to the Owner that all materials have been removed, handled, transported and disposed of in conformance with the requirements and codes of the governing authorities.
1.5 PROJECT CONDITIONS

A. Notify Architect/Engineer of discrepancies between Drawings and existing conditions before proceeding with Work.

B. Assume responsibility for actual condition of existing construction.

C. Occupancy: The building will remain in use for other construction activities during the work. No means of egress or access to the exterior shall be blocked without approval of the Owner and establishment of alternate means of egress.

D. Damages: Promptly repair any damage caused by demolition operations to structure and facilities to remain at no cost to the Owner. The Contractor shall promptly notify the Owner and Architect/Engineer in writing of any damage and the proposed method of repair.

E. Traffic:
   1. Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
   2. Conduct demolition and removal operations in a manner to minimize traffic over areas to remain.

F. Protection:
   1. Ensure safe passage of persons entering or exiting the building. Conduct operations to prevent injury to the structure, other facilities, and persons.
   2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of structures or building materials during demolition. Contractor shall design shoring as required.
   3. Provide temporary canopies, walls and signage to protect building users, and to maintain a safe condition at all times. Exits shall not be blocked at any time during the Work.
   4. Provide temporary protection of existing construction and interior stored materials from the weather until removed portions are completely replaced with new construction. Any damage associated with improper protection from weather and elements shall be repaired at Contractor's cost.

G. Pollution Control: The Contractor shall design, provide, and maintain a containment system to collect all of the dust and debris generated during the course of the work. This containment system shall prevent any dust or other fine particles from entering the building interior, the surrounding air or coming in contact with pedestrians and vehicles. Use water sprinkling, temporary enclosures, and other suitable methods. Comply with governing regulations pertaining to environmental protection.

1.6 WORK SEQUENCE

A. Do not remove existing materials when precipitation is imminent.

B. Do not remove more existing material than can be replaced with new material or made watertight by the end of the work day.

C. Conduct demolition and removal operations in a manner to minimize traffic over newly installed areas. Protect completed installation areas and installations in progress from damage resulting from ongoing demolition or removal operations.
PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 EXAMINATION OF EXISTING CONDITIONS

A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
   1. Inventory and record condition of items to be removed and salvaged or reinstalled.

B. Document with photographs or videotape, or both, existing conditions of adjoining construction, including finish surfaces, which might be misconstrued as damage caused by demolition activities.

C. Examination and Acceptance of Conditions: Before proceeding with each component of Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Verify compatibility with and suitability of substrates.
   2. Examine walls and roofs for suitable conditions where products and systems are to be installed.
   3. Provide written description of conditions detrimental to performance of Work, including substrates and unacceptable installation tolerances, and recommend corrections.
   4. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected. Proceeding with Work indicates acceptance of surfaces and conditions.

D. When unanticipated structural, electrical, or mechanical elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit written report to Architect/Engineer.

E. Survey existing conditions as Work progresses to detect hazards resulting from construction.

F. Provide access to Work areas and perform localized demolition as necessary for inspection of concealed underlying conditions by Architect/Engineer and Owner.

3.2 UTILITIES AND MECHANICAL AND ELECTRICAL SYSTEMS

A. Disconnect and seal or cap off indicated utility services and mechanical and electrical systems in Work areas.

B. Where existing utility services or mechanical or electrical systems are required to be removed, relocated, or abandoned, bypass such services/systems before beginning Work to prevent interruption to occupied areas.

3.3 OPERATIONS

A. Locate the dumpster(s) as directed by the Owner.

B. Stockpiling debris on the roof is not permitted without approval by the Architect/Engineer and the Owner.
C. Fully loaded dumpsters shall be promptly covered and removed from the job site.

D. At the end of the work day, all partially filled dumpsters shall be securely covered or removed from the job site.

3.4 SELECTIVE DEMOLITION

A. Demolish and remove existing construction and installations only as necessary and required for proper installation of Work indicated on Drawings and Specifications.
   1. Conduct removals carefully to avoid damaging existing construction and installations that will remain. Protect construction that will remain against damage and soiling. When permitted by Architect/Engineer, items may be removed to suitable, protected storage location during selective demolition and cleaned and reinstalled in original locations after selective demolition operations are complete.
      a. Neatly cut openings and holes plumb, square, and true to dimensions required.
      b. Cut or drill from exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
      c. Use cutting methods least likely to damage construction to remain.
      d. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
      e. Temporarily cover openings to remain.
   2. Provide and maintain shoring, bracing, and structural supports, as required to preserve stability and prevent movement, settlement, or collapse of construction or finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   3. Remedy damage to existing construction and installations caused by Contractor operations.
      a. Materials for use in repair of original surfaces, but not otherwise specified, shall conform to the highest standards of the trade involved, and be in accordance with approved industry standards and shall be as required to match existing surfaces.
      b. Workmanship for repair of existing material shall, unless otherwise specified, be equal to similar workmanship existing in or adjacent to the space where the work is being done.

B. Items to be Salvaged or Reinstalled.
   1. Carefully remove from building, clean, and mark with identifying code.
   2. Store in secure area and protect from damage.
   3. Replace damaged items to be reinstalled with new items to match undamaged originals.
   4. Items to be salvaged.
      a. Pack or crate, and label contents of containers.
      b. Store in secure area until delivery to Owner.
      c. Transport to Owner’s on-site storage area.
      d. Protect from damage during transport and storage.

3.5 ROOFING REMOVALS

A. Remove all roof membranes, insulation, fasteners, and asbestos containing flashings complete to metal or concrete substrates, as indicated in drawings.
B. All roofing materials containing asbestos and must be removed in compliance with all Federal, State, and local regulatory agencies. Additionally, the requirements of Wesleyan for the removal of asbestos containing materials must be satisfied.

3.6 DISPOSAL OF DEMOLITION MATERIALS

A. Unless noted otherwise, promptly remove demolition debris from site and dispose of legally. Do not burn.

3.7 CLEANING

A. Clean adjacent surfaces and structures of dust, dirt, and debris including the stored materials below. Return all areas to condition existing before Work began.

END OF SECTION
SECTION 06114
WOOD BLOCKING, CURBING AND SHEATHING

PART 1 GENERAL

1.1 DESCRIPTION OF WORK
   A. Furnish necessary labor, materials and equipment to install new treated wood consisting of
      blocking, curbing and sheathing as indicated on the construction documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 1 Specification Sections, apply to this Section.
   B. Related Sections include the following:
      1. Division 7 Specification Sections

1.3 REFERENCES
   A. ALSC - American Lumber Standard Committee: Softwood Lumber Standards
   B. APA - Engineered Wood Association: Grades and Standards
   C. FS TT-W-571 - Wood Preservation: Treating Practices
   D. NFPA - National Forest Products Association
   E. AWPA - American Wood Preservers' Association: Book of Standards
   F. SFPA - Southern Forest Products Association

1.4 QUALITY ASSURANCE
   A. Lumber Grading Agency: Certified by ALSC
   B. Plywood Grading Agency: Certified by APA

1.5 SUBMITTALS
   A. Provide technical data on wood preservative materials and application instructions.
   B. Submit technical data sheet on all lumber materials proposed for use.
PART 2 PRODUCTS

2.1 MATERIALS

A. Lumber Grading Rules: APA, NFPA, SFPA

B. Softwood Lumber: Southern Yellow Pine species, two grade, 19% maximum moisture content.

C. Plywood: APA Grade C-C, with waterproof glue, sanded

D. Nailable Insulation Board: Polyisocyanurate insulation board bonded to plywood on top face. Provide insulation thickness as required per drawings. Provide 3/4 inch thick plywood top face.

2.2 WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): CCA treatment only.

B. All wood specified in this section shall be pressure treated.

2.3 FASTENERS

A. For securing wood blocking to wood blocking, use rough hardware sized as required to allow penetration of one-half the dimension of the member being fastened into or 1-1/2 inches, which ever is less. Use hot-dipped galvanized steel or cement coated common nails.

B. For securing wood nailers, sheathing or blocking to masonry or concrete, use:
   1. Fastener type: Tapcon
   2. Head type: Flat head
   3. Diameter: 1/4 inch
   4. Embedment into substrate: 1-1/2 inches
   5. Material and Finish: fluropolymer
   6. Manufacturer: ITW Buildex
   7. Confirm anchorage into concrete by conducting pull out tests in the presence of the Architect/Engineer.

PART 3 EXECUTION

3.1 WOOD BLOCKING AND CURBING

A. Curb areas as shown on the drawings. Form corners by lapping side members alternatively.

B. Provide blocking and nailers where indicated or otherwise required to attach roofing membrane where indicated.

C. Install all wood blocking and curbing to resist a minimum lateral force of 200 lb per LF or greater if required by the roof membrane manufacturer.
3.2 CLEANING

A. Clean up debris promptly so that other operations may be performed in the work area.

END OF SECTION
SECTION 07 50 30
MODIFIED BITUMEN ROOFING AND FLASHINGS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Furnish all labor, materials and equipment to install insulation board, coverboard, torch-applied, multi-layer SBS modified bitumen membrane, modified bitumen and sheet metal flashings.

B. Description of Systems: Roofing shall consist of two (2) plies of prefabricated non-woven polyester reinforced SBS modified bitumen membrane (top ply granule surfaced, bottom ply smooth surfaced) over a prepared substrate.

1.2 REFERENCES

A. Membrane: Membrane manufacturer and specific products referenced shall be the only approved products for use.

1.3 SUBMITTALS

A. Specimen copy of Manufacturer’s roofing and waterproofing system warranty proposed for the Work. Submit prior to commencement of the Work.

1. Fully executed warranty, which shall be issued upon Manufacturer’s approval of the installation. In no event shall the effective date of the warranty predate the completion and acceptance by Owner of the roof membrane system and all associated work.

B. Product Data: Submit product data and general recommendations from roofing and waterproofing materials manufacturer, for types of roofing required. Submit manufacturers' instructions for use of all materials including sheet roofing, flashing material, and accessories. Provide for membrane materials, base flashings, and associated adhesives, cements, primers, sealants, water cut-off mastics, prefabricated accessories; cover strips, fasteners, anchor bars, and other related items.

C. For details not addressed by the project drawings, submit shop drawings for approval by the Owner prior to start of work. Shop drawings shall include: Outline of roof and roof size, location and type of penetrations, perimeter and penetration details, special details and list of materials.

D. A letter from the material manufacturer specifically referencing this project and stating their intention to provide the specified warranty.

E. The current published product and installation literature of the materials manufacturer shall be considered part of this specification. Any revisions to the published literature, prior to the date of installation of the product shall also be considered part of this specification.
F. Samples (minimum 6 inch by 6 inch) of each type of sheet roofing shall be submitted.

G. Prior to start of work, submit proposed detail for temporary watertight night cutoffs for review and approval, clearly indicating tie-in of new modified roofing to existing substrates at temporary daily terminations during the progress of the work.

1.4 QUALITY ASSURANCE

A. Contractor Requirements
   1. Contractor shall be approved by the manufacturer of the roofing materials and authorized to install the specified warranty system.
   2. Portions of these specifications may exceed the minimum requirements of the membrane material manufacturer. In no event shall less quality, less weight or a lesser number of plies or any other lesser requirements be acceptable than at least the minimum of such required by this Specification Section and those of the manufacturer.
   3. Maintain one copy of project documents on site at all times during work activities. Record all changes and provide an as-built drawing at the completion of the project.
   4. Membrane Manufacturer: Soprema or Approved Alternate
   5. Acceptable Applicator: Contractor shall be approved by the roofing materials manufacturer with a minimum of three (3) years experience installing the specified product. The Contractor shall submit written evidence, from the membrane manufacturer that they are an Approved Applicator and have been for three (3) years (minimum) and that they are eligible to install the specified system as necessary to qualify for the specified warranty. A copy of the guarantee proposal shall be submitted with the Bid.
   6. Technical Assistance: The contractor shall arrange for all required manufacturer support required to maintain eligibility for specified manufacturer’s warranty.
      a. Inspection: Prior to, during installation and at completion of the installation, an inspection shall be made by a representative of the manufacturer in order to ascertain that the roofing system has been installed according to their published specifications, standards and details.

B. Regulatory Requirements:
   1. Materials and application shall be such that the finished assembly, insulation and roofing membrane shall meet the requirements for FM Class I.
   2. Anchorage of roofing insulation and membrane shall meet design pressure of FM 1-105 wind uplift requirements.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original unopened containers.
B. Inspect materials delivered to the site for evidence of contact with moisture. Reject delivery of materials with stained or wet wrappers, or torn covers. Packaging labels must be readable, identify the material, and indicate conformance with the reference standard applicable to the material. Additionally, for roofing membrane sheet, adhesives/cements and sealant materials, labels shall indicate the date of manufacture and lot number.

C. Store all materials, including membrane, between 50 degrees F, and 80 degrees F. If exposed to lower temperature, restore to proper temperature before using. No roofing membrane or flashing membrane shall be installed unless the outdoor temperature is 40 degrees F and rising.

D. Store all materials in dry area and protect from moisture and physical damage. Damaged materials shall be removed from site and replaced at no additional cost to the Owner.

E. Materials shall be handled, transported and stored in a manner enabling undamaged material to be installed. Rolls or material displaying a flattened appearance shall be considered damaged and shall not be installed.

F. Materials requiring fire resistance classification shall be delivered to the job with labels from an appropriate independent laboratory attached and packaged as required by the labeling service.

G. Deliver materials in sufficient quantity to assure continuity of work. Handle rolled goods in a manner to prevent damage to edges or ends. Select and utilize handling equipment so as to avoid damage to materials handled, to applied roofing or to other construction.

H. Store rolled goods on ends. Protect materials from damage by construction traffic or other work. Roll goods which have been damaged by dropping, flattening or other mishandling, or have ends with embedded, foreign material shall not be incorporated into the work. Any such installations shall be removed and replaced at no additional cost to the Owner.

I. Do not overload the roof beyond the design loads with products or equipment.

J. Protect the existing roofing from damage due to traffic and material loading.

K. Use all materials within the time limits prescribed by the manufacturers.

1.6 PROJECT/SITE CONDITIONS

A. Do not install roofing during inclement weather, below the minimum ambient or surface temperatures recommended by the membrane manufacturer, or when relative humidity or wind speed is not within the range acceptable to the membrane manufacturer.

B. Contractor shall not proceed with or install roofing during inclement weather, except for temporary work necessary during inclement weather to protect materials that are already installed. Remove all temporary work before installing permanent materials.

C. Surfaces on which the insulation or membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper installation.
D. Waste products (petroleum, grease, oil and solvents - vegetable or mineral oil and animal fat - direct contact with steam venting) shall not be allowed to come in contact with the roof membrane system.

E. All membrane and substrate surfaces must be clean and dry.

F. Daily Seal: Care shall be exercised to ensure that moisture does not penetrate beneath any completed sections of the roofing by temporarily sealing the loose edge of the membrane at the end of each work day and prior to the arrival of inclement weather. The manufacturer's requirements shall be followed closely. Contractor shall inspect existing components for moisture intrusion along the tie-in after opening the daily seal on the next work day.

1.7 WARRANTY

A. Manufacturer's Warranty: The Contractor shall provide a twenty (20) year No Dollar Limit System Written Transferable Warranty from the date of acceptance of this work for the new low slope roof and waterproofing systems from the membrane manufacturer, or other approved entity as approved by the Owner, agreeing to replace/repair defective materials and workmanship at no additional cost to the Owner. Warranty shall include responsibility for removal and replacement of other work which conceals defective work or materials. Warranty shall cover Workmanship for the full twenty (20) years and all membrane materials also for the full twenty (20) years. Included in the 20 year warranty shall be the roofing membrane, flashing and insulation. Should the membrane manufacturer require materials not shown on the drawings or included in the specifications or flashing details that differ from those shown on the drawings to qualify for the specified warranty, the contractor shall comply with the requirements of the manufacturer at no additional cost to the owner.

B. Contractor Guarantee: Provide written (notarized) guarantee agreeing to replace/repair defective materials and workmanship at no additional cost to the Owner for a period of two (2) years after substantial completion. The guaranty includes responsibility for removal and replacement of other work which conceals roofing membranes. This guaranty shall include all work installed under this contract including membranes, flashings, drainage systems, metal work, insulation, fasteners and miscellaneous items.

PART 2 PRODUCTS

2.1 GENERAL

A. If insulation is provided by other than the membrane manufacturer, Contractor shall submit a letter of acceptance from the membrane manufacturer for approval of insulation proposed for use and verification that insulation shall be included in the system warranty.

B. All materials to be used in the work, including temporary cut-offs and tie-ins, shall be certified by the manufacturer to be free of asbestos.
C. Any asbestos containing material inadvertently installed under this contract by the Contractor, or their subcontractors, shall be removed and replaced with asbestos-free products at no additional cost to the Owner.

D. Top ply of modified bitumen roofing membrane shall be coated with ceramic granules. Granule color shall be black. Consult owner concerning preferred color prior to ordering.

E. Approved flashing system shall also be utilized for stripping over of sheet metal flanges except as may be otherwise noted on the drawings.

2.2 APPROVED ROOF MEMBRANE ASSEMBLY

A. For all low slope roof areas:

1. Manufacturer: Soprema

   a. Vapor Retarder (Alternate): Soprema Flam 180SP

      1) Description: Flashing membrane shall have a non-woven polyester reinforcement and modified elastomeric asphalt. Bottom side shall have a thermofusible plastic film and top side is to have a high brushed sanded surface. This membrane is to be applied by torching only.

      2) Components: Reinforcement shall be 3.68 lbs/sq. non-woven polyester. Elastomeric asphalt shall be a mix of selected bitumen and SBS thermoplastic polymer.

      3) Physical Properties:

         a) Tensile strength:

            Longitudinal - 119 lbs/in

            Transversal - 88 lbs/in

         b) Ultimate elongation:

            Longitudinal - 58%

            Transversal - 64%

         c) Static Puncture Strength - 67 lbs

         d) Low Temperature Flexibility - No Cracking @ 22 degrees F.

         e) SBS elongation - 1500%

         f) Load Strain Product

            Longitudinal - 6902

            Transversal - 5632
b. Base Ply: Soprema Flam 180SP

1) Description: Flashing membrane shall have a non-woven polyester reinforcement and modified elastomeric asphalt. Bottom side shall have a thermofusible plastic film and top side is to have a high brushed sanded surface. This membrane is to be applied by torching only.

2) Components: Reinforcement shall be 3.68 lbs/sq. non-woven polyester. Elastomeric asphalt shall be a mix of selected bitumen and SBS thermoplastic polymer.

3) Physical Properties:
   a) Tensile Strength:
      Longitudinal - 119 lbs/in
      Transversal - 88 lbs/in
   b) Ultimate elongation:
      Longitudinal - 58%
      Transversal - 64%
   c) Static Puncture Strength - 67 lbs
   d) Low Temperature Flexibility - No Cracking @ 22 degrees F.
   e) SBS elongation - 1500%
   f) Load Strain Product
      Longitudinal - 6902
      Transversal - 5632
   g) Approximate Roll Weight - 79 lbs
   h) Approximate thickness - 120 mils

c. Cap Ply: Soprema 250 FR GR

1) Description: Waterproofing membrane shall have a non-woven polyester reinforcement and thermofusible elastomeric asphalt, with a fire-retardant agent added. The top side shall be self-protected with colored granules. The underside shall be protected by a plastic film. This membrane is to be torch applied only.
a) Color to be either White or Black

2) Components: Reinforcement shall be 5.12 lbs/sq non-woven polyester. Elastomeric asphalt shall be a mix of selected bitumen and SBS thermoplastic polymer.

3) Physical Properties:
   a) Tensile Strength:
      Longitudinal - 163 lbs/in
      Transversal - 122 lbs/in
   b) Ultimate Elongation
      Longitudinal - 60%
      Transversal - 69%
   c) Static Puncture Strength - 55 lbs
   d) Low Temperature Flexibility - No cracking @ 22 degrees F
   e) SBS Elongation - 1500%
   f) Load Strain Product:
      Longitudinal - 9780
      Transversal - 8418
   g) Approximate Roll Weight - 84 lbs
   h) Approximate Roll Thickness - 160 mils

2.3 BASE PLY

A. Modified bitumen cements, adhesives, mastics, primers, ceramic granules, sealants, prefabricated accessories, fasteners, anchor bars, and other related items are to be furnished or recommended by the membrane material manufacturer unless otherwise indicated.

2.4 CAP PLY

A. Modified bitumen cements, adhesives, mastics, primers, ceramic granules, sealants, prefabricated accessories, fasteners, anchor bars, and other related items are to be furnished or recommended by the membrane material manufacturer unless otherwise indicated.
2.5 RELATED MODIFIED BITUMEN MATERIALS

A. Modified bitumen cements, adhesives, mastics, primers, ceramic granules, sealants, prefabricated accessories, fasteners, anchor bars, and other related items are to be furnished or recommended by the membrane material manufacturer unless otherwise indicated.

2.6 INSULATION, PROTECTION BOARD, EDGE STRIPS

A. Insulation for roof areas:
   1. Flat Polyisocyanurate Foam Insulation: Type II, Class 1, Grade 3 tapered Polyisocyanurate Board: 1/2 in. thick (minimum), 25psi compressive strength insulation boards adhered with Soprema High Velocity adhesive (HV2 or HV3) as recommended by Soprema.
   2. Cover Board: 5/8-in. thick Dens-Deck Prime roof board manufactured by G. P. Gypsum Corporation, Atlanta, Georgia. Adhere board to insulation with Soprema High Velocity adhesive (HV2 or HV3) as recommended by Soprema.

2.7 SHEET METAL

A. Copper: ASTM B370, 16 ounce per square foot for fascias and flashings, 20 ounce per square foot for cleats.
B. Stainless Steel: Type 304 stainless steel.
C. Solder: Composition of 50% tin and 50% lead for use with copper and stainless steel.
D. Flux: Muriatic acid killed with zinc or approved brand of liquid soldering flux. Acid shall be thoroughly neutralized and washed off after soldering.
E. Aluminum: 0.040 inch thick for fascias and flashings, 0.050 inch thick for cleats, 0.040 inch thick for metal wall panels, 0.40 inch thick for metal wall panel transition flashings. Baked on fluoropolymer coating system based on Kynar 500 resin. Color to be non-standard custom color, as selected by the Architect/Engineer.

2.8 SEALANTS

A. For masonry to masonry and masonry to metal - Soneborn NP-1 (or approved equal). Color to be selected by Architect/Engineer from standard color chart.
B. For metal to metal - Dow Corning 795 (or approved equal). Color to be selected by Architect/Engineer from standard color chart.

2.9 FASTENERS AND ACCESSORIES

A. Termination bar - Tru-Fast TB-100 aluminum termination bar (0.1 inch thick by 1 inch wide with pre drilled holes 8 inches on center), 800-443-9602.
B. Sheet metal counterflashing securement to sheet metal receivers - Hi-Tech fasteners 410 stainless steel self-drilling screws, No. 8 - 18 x 3/4 inch with Philips pan head, 800-858-7341 -OR- 1/8” closed end stainless steel pop rivets.

2.10 LUMBER

A. All wood nailers, blocking and cants:
   1. Species and Grade for nailers and blocking: Douglas Fir or Southern Yellow Pine; WWPA Structural Joist and Plank Class, No. 2 Grade.
   2. Preservative treatment: Treatment conforming with AWPB (American Wood Preservers Bureau) Specification LP-2 Standard for lumber and timber. This treatment is commonly referred to as pressure treated or “Wolmanized”.
   3. Each piece of treated lumber delivered to the site must bear the stamp of the AWPI (American Wood Preservers Institute), Quality Mark, indicating compliance with the requirements of the AWPI Quality Control Program.
   4. Each piece of treated lumber must bear a stamp that it is kiln dried before the delivery of product, and indicating conformance with AWPB Specifications, Section 3.1.2.
   5. Treated lumber shall be dried by supplier after treatment. Provide documentation from treatment supplier that the lumber has been air dried after treatment, back to 19% or less moisture content by weight.
   6. Dimensions: As required by conditions encountered and as shown on project details.

B. Plywood

1. Standards: Comply with PS 1/ANSI A199.1 for plywood panels. All panels shall be 5-ply (min). For products not manufactured under PS 1 provisions, comply with American Plywood Association “Performance Standard and Policies for Structural-Use Panels”, Form E445.
2. Trademark: Factory-mark each construction panel with APA trademark evidencing compliance with grade requirements and AWPI trademark evidencing compliance with treatment requirements.
3. Preservative treated with waterborne preservative with minimum 0.25 lb/ft.³ retention. Treated plywood shall be air dried by supplier after treatment. Provide documentation by treated plywood supplier that plywood dried back to 18% or less moisture content by weight.
4. Grades:
   a. Plywood shall be thickness as noted on the drawings for any parapet wall sheathing, and for installation on top of any indicated parapet walls and APA (American Plywood Association) Rated Sheathing Exterior Exposure (C-C Exterior). Note:
“CDX” and Exposure 1 plywood do not comply with this specification and are not approved for use on low slope roofing details where treated plywood noted. For steep sloped roof sheathing, Exposure 1 plywood shall be used. Additional plywood thicknesses as may be noted on the drawings.

2.11 WALKPADS

A. Traffic topping shall be Sopralene Flam 350.

2.12 INTERIOR PROTECTION

A. Interior Protection

1. Contractor to provide interior protection in all the lab spaces directly below the footprint of the lower roof. Contractor is to coordinate with Owner the extent of protection to adequately protect and keep clean the finishes and contents of the building interior.

PART 3 EXECUTION

3.1 INSPECTION

A. The installer shall examine the areas and conditions under which the roofing is to be installed, and notify the Owner, in writing, of conditions detrimental to the proper and timely completion of this phase of the work. Contractor shall not begin work until the substrates have been prepared as specified and as necessary, and are ready and acceptable to have materials installed. By beginning work, the Contractor acknowledges that the substrates are satisfactory.

B. Prior to the start of work, the substrate shall be relatively smooth and free of debris, sharp edges and other surface irregularities, as determined by Architect/Engineer that will be detrimental to or prevent the proper installation of the system.

C. All codes having jurisdiction shall be observed strictly in the construction of the project, including all applicable state, city, and county building, zoning, electrical, mechanical, plumbing and fire codes. Contractor shall verify all code requirements before commencement of construction and bring any noted discrepancies between code requirements and the construction documents to the attention of the Architect/Engineer in writing.

D. Details and sections on the drawings are shown at specific locations and are intended to show general requirements throughout. Details noted “typical” imply all conditions treated similarly. Modifications shall be made by Contractor to accommodate minor variations.

E. All areas, dimensions, and conditions shown and indicated are approximate. Contractor shall verify existing conditions prior to the start of work. Additional compensation shall not be granted for conditions encountered after the start of work that are different from those listed.
F. All drawings and conditions shall be fully coordinated by Contractor to verify all dimensions, conditions, slopes, drains, outlets, recesses, reglets, bolt settings, sleeves, etc.

G. Contractor shall bring errors and omissions noted by the Contractor which may occur in Contract Documents to the attention of the Architect/Engineer in writing and written instructions shall be obtained before proceeding with the affected work.

H. Verify that all drains, sleeves, curbs or other roof penetrations are rigidly secured.

I. The Contractor shall verify all dimensions and job conditions at the job site sufficiently in advance of work to be performed to assure the orderly progress of the work.

3.2 PREPARATION OF SUBSTRATE

A. Protect adjacent surfaces not designated to receive roofing.

B. The Contractor shall provide and install all curbing, expansion joints, and wood nailers at all edges, projections and openings, as indicated on the Drawings, and where metal flanges or flashing are to be installed.

C. Before installation of roofing or insulation materials, all deck surfaces shall be dry, sound, clean (broom swept), smooth, primed, and free of debris, loose material or defects which would have an adverse affect on the roofing or insulation or their performance, and provide substrate acceptable to the roof membrane manufacturer.

D. Adjust accessory items to proper height to be compatible with finished height of new insulation and roofing system.

E. Apply primer over all concrete, masonry, and sheet metal substrates to receive new membrane materials in accordance with the recommendations of the membrane manufacturer.

3.3 INSTALLATION

A. General:

1. Comply with manufacturer's instructions for handling and installation of roofing materials except where more stringent requirements are indicated in the specifications and drawings. Any changes to these specifications, based on recommendations by the material manufacturer, shall be approved in writing by the Architect/Engineer prior to the start of work.

2. Schedule installation to minimize period of exposure of substrates.

3. The Contractor shall not phase in the installation of the base ply and top ply roof membranes.

4. Contractor shall not use the existing or new roofs as work or storage platforms, without adequate protection.
5. Daily Seal: Provide temporary watertight cut-offs and tie-ins prior to arrival of inclement weather and at the end of each work day, as necessary to prevent moisture intrusion below the new and existing membrane and into the new roof and/or building. Remove all temporary work at the beginning of the next work day and verify that water has not breached the permanent work.

6. Should conditions be uncovered or created which would be detrimental to the proper conduct of specified work, immediately notify the Owner Representative of these conditions for resolution.

7. Extend roofing membranes and flashings as shown to provide complete membrane over area(s) indicated to be roofed. Seal to all equipment projections through membrane and seal all membrane and flashing seams. Ensure complete bonding to vertical surfaces and, where shown or recommended by material manufacturer, to horizontal surfaces.

   a. Contractor shall perform all testing and other examination of deck surface as recommended by the roofing materials manufacturer and as recommended by manufacturer of the roof deck materials. Responsibility for determination of moisture content of deck being suitable for application of roofing materials shall be the sole responsibility of the Contractor. The proposed roof membrane manufacturer shall inspect the wood deck condition and water content and state in writing it is acceptable to install new roof membrane materials.

   b. Contractor shall follow manufacturer's recommendations for unrolling the membrane to allow to “relax” and flatten at application temperatures to assure that the top and bottom plies have stabilized and are ready for incorporation into the roof.

   c. Except as otherwise required by unusual circumstances or as otherwise may be indicated in these specifications, begin installation of the roof membrane system at the low point of the roof and proceed upslope. Install membrane plies shingle style, perpendicular to the slope.

3.4 VAPOR RETARDER/BARRIER

   A. Existing is to remain at lower roof, protect from damage.

   B. Install new vapor retarder at upper roof as described below:

      1. Starting at the low point of the roof, install approved vapor retarder membrane perpendicular (at right angle) to the slope.

      2. Fully bond the vapor retarder to the prepared substrate, applying each sheet directly behind the heat applicator.

      3. Provide 3 inch minimum side and end laps and stagger end laps a minimum of 3 feet.

      4. At end laps, cut “dog ear” angles from underlying sheet at the finish edge and the overlapping selvage edges. Using a clean trowel, apply top pressure to top seal t-laps immediately following sheet application.
5. Do not apply heat directly to deck or substrate.

3.5 ROOF INSULATION COVER BOARD

A. Polyisocyanurate Board: 4 in. thick (minimum), Type II, Class 1, Grade 3, 20psi compressive strength insulation boards adhered to the concrete deck or vapor retarder with High Velocity adhesive as recommended by Soprema. Provide two layers of two inch thick insulation boards.

3.6 ROOFING MEMBRANE

A. General:
   1. Install the roofing membrane in accordance with the latest printed application requirements of the roofing membrane manufacturer except where the requirements of these project specifications are more stringent as determined by the Architect/Engineer. In such instances, the more-stringent requirement shall apply.
   2. Traffic: Keep foot traffic and equipment movement to the absolute minimum during application of the roof membrane while the bitumen is hot and fluid. In addition, minimize traffic over new roofing prior to application of the final top ply.
   3. At locations where drawings indicate that membrane or flashings shall be turned down the outside face of walls, the portion turned down the walls shall be installed “dry” (without asphalt, mastic, or adhesive).

B. Roofing Construction Safety Precautions
   1. Torch Safety Precautions
      a. General: All torch-applied membranes shall be installed in accordance with recommendations provided in Factory Mutual Property Loss Prevention Data Sheet 1-33, "Safeguarding Torch Applied Roof Installations" and shall comply with all Federal, State, and Local Fire Prevention Codes.
      b. Installation Safeguards
         1) Torches used to secure membranes should be used in accordance with manufacturer's recommendations. The flame from a hand-held torch should be constantly moved from side to side. To prevent smoldering orignition of membranes, they should not be overheated.
         2) Caution should be used when working around openings, penetrations or flashings. Wood decking, wood nailers, cant strips and metal flashing should not come in direct contact with the flame of the torch. Small torches should be used to heat the underside of the membrane away from these areas before securement. The torch should not be used in areas where the flame impingement cannot be fully viewed. Open flames should not be left
unattended. Roof openings/vents should be covered with a stable noncombustible cover to prevent ignition of building components or contents.

   a) Extreme caution should be used near penetrations such as exhaust vents to prevent ignition of accumulated flammable discharges. Such accumulations should be cleaned/removed before roofing work begins.

   b) Air conditioning units and ventilating fans should be shut down before torch work is done in surrounding areas.

   c) Expansion joints should be filled with mineral wool or ceramic fiber with a steel cover plate below.

3) A torch stand should be used to direct the flame upward when momentarily not in use. The cylinder valve should be closed to burn off propane in the line before shutting off the torch head. The gas supply should be shut off whenever a propane odor is detected.

4) Installations should be coordinated with concerned parties, and close supervision should be provided.

5) Torches should not be used near gas lines, electrical wires or flammable liquids during roof construction.

6) The torch flame should not be applied to a combustible substrate when installing the membrane. All combustible substrates and materials in the vicinity of heat welded membranes shall be covered with a glass fiber base sheet before the torch applied membrane is installed. Torch flames should not come in contact with exposed plastic roofing cement or other combustible materials.

7) The operator of the torch shall remain on the premises to perform a fire watch for a minimum of one (1) hour after the torch is utilized. All roof areas worked on should be checked for "hot spots" and signs of smoldering. The inside of the building should also be inspected for signs of fire or smoke. All "hot spots" or fires shall be extinguished and reported to the Architect/Engineer.

c. Equipment Safeguards

   1) Proper equipment should be used to heat roofing membranes. Torches should be equipped with a pilot adjustment, flame height adjustment, 25 to 50 feet of approved or listed hose, pressure gauge and regulator. A spark ignitor should be used.

      a) Safety caps should be tied to all propane cylinders and installed on the valve whenever cylinders are not in use. Carts used to transport propane cylinders should be stable. Tall, narrow, standing cylinders should be chained against walls or in proper carts.
2) The propane cylinder should be adequately sized for the torch used. If frost buildup occurs on the propane cylinders and the rate of vapor withdrawal is no longer adequate for operating conditions, the cylinder should not be placed on its side or heated with the torch flame. The hose should be disconnected and a larger cylinder used. Liquid propane cylinders may be of either the vapor withdrawal or liquid withdrawal type.

   a) Liquid withdrawal cylinders are preferred due to frost buildup associated with vapor withdrawal cylinders. However, when vapor withdrawal cylinders are used, or if temperatures are below 20 degrees F, 40 or 100 lb. Cylinders should be used with larger torches (such as those used on the field of the roof).

3) Equipment should be thoroughly inspected and repaired as needed. Propane cylinders should be inspected for dents. If dents larger than 1" in diameter are found, the cylinder should be replaced. Torch and cylinder connectors should be visually inspected and checked for leaks with a soap and water solution. An open flame should not be used to test for leaks.

   a) Leaky equipment should not be used. Regulator adjustments and pressure gauges should be checked to assure they are operable. The vent on the regulator should be checked to ensure it is not blocked. If an unstable flame occurs (one which roars loudly and tends to blow itself out), the equipment should be repaired or replaced immediately.

4) A fire watch of all equipment utilized for the torching application should be conducted for at least one (1) hour after torch work has been completed.

d. Fire Extinguishing Equipment

   1) The Contractor shall provide, on the roof, at least one (1) portable fire extinguisher with a minimum 4-A rating, two (2) portable fire extinguishers with a minimum 2-A rating each, or a water hose connected to a water supply at the building where the torching is being done. In addition, there should be at least one 10-lb. multipurpose dry chemical portable extinguisher within 20 feet horizontal travel distance of torch-applied roofing equipment.

e. Fuel Handling Safeguards

   1) Fuel containers, burners and related appurtenances of roofing equipment in which liquefied petroleum gas is used for heating should comply with Factory Mutual Data Sheet 7-50; "Compressed Gases in Cylinders" and NFPA 58; "Standard for the Storage and Handling of Liquefied Petroleum Gases".

   a) All fuel containers should be located at least 10 feet from the burner flame or at least 2 feet away when properly insulated from heat or flame.
b) Storage of LPG cylinders or containers on rooftops is prohibited. All LPG cylinders or containers shall be removed from the rooftop and placed in a secure area, protected against tampering, at the end of each work shift.

c) Propane cylinders shall not be hoisted by their valves. Straps placed around the cylinders should be utilized.

C. Safety Considerations

1. The Contractor shall follow all established safety procedures as defined by OSHA or other governing agencies.

2. It is the Contractor's responsibility to insure safety at the project work area at all times.

3.7 CANT AND TAPERED EDGE STRIPS

A. Install cants and tapered edge strips where noted on drawings. Cants shall be set into asphalt plastic cement. Tapered edge strips shall be mechanically attached to the concrete deck.

3.8 APPLICATION OF MODIFIED BITUMEN ROOFING MEMBRANE

A. Base Ply

1. Starting at the low point of the roof, install approved bottom ply membrane perpendicular (at right angle) to the slope.

2. Fully bond the bottom plies to the prepared substrate, applying each sheet directly behind the heat applicator.

3. Provide 3 inch minimum side and end laps and stagger end laps a minimum of 3 feet.

4. At end laps, cut “dog ear” angles from underlying sheet at the finish edge and the overlapping selvage edges. Using a clean trowel, apply top pressure to top seal t-laps immediately following sheet application.

5. Do not apply heat directly to deck or substrate.

B. Top Ply

1. Fully bond top ply parallel to the base ply, applying sheet directly behind the heat applicator.

2. Provide 3 inch minimum side and end laps and stagger end laps a minimum of 3 feet.

3. At end laps, cut “dog ear” angles from underlying sheet at the finish edge and the overlapping selvage edges. Using a clean trowel, apply top pressure to top seal t-laps immediately following sheet application.
4. Stagger side lap seams between top ply 12 to 18 inches from the side lap seams of the bottom ply.

### 3.9 ROOFING FLASHINGS

**A. Walls and Curbs:**

1. Neatly flash vertical walls and curbs in strict compliance with the roofing membrane manufacturer's specifications for Alsan RS Reinforced Liquid Membrane Flashing and as noted in the project details and these specifications. The wall and curb flashings shall extend a minimum of 8-inches above the roof surface and 4-inches out onto the field of the roof past the base of cants and tapered edge strips.

2. Begin all wall and curb flashing installations at the low point of the wall or curb and proceed up slope to avoid back water seams which buck water.

3. Extend flashing to the top of all curbs and into new or existing reglets as indicated on drawings for incorporation into new roof system. Unless otherwise indicated or not possible due to existing conditions encountered, flashing height shall be 8 inches (minimum) above the finished roofing surface.

4. Secure upper edges of wall and curb base flashings at 6 to 8-inches (max) on center and within 2-inches of the end of each section of base flashing. Extruded termination bar with bent edges shall be installed at the top of all base flashings to mechanically attach the new and underlying existing base flashings in place. Refer to project details and approved manufacturer’s requirements. In no instance, even if approved by membrane manufacturer, shall base flashing attachment exceed 8-inches on-center.

**B. Equipment Penetrations**

1. Flash all penetrations (pipes, conduits, etc.) passing through the membrane as detailed. Where not detailed, install in strict accordance with the manufacturer's details and recommendations.

2. Where recommended by roof membrane manufacturer, apply approved sealant along base of equipment penetration to seal equipment to edge of flashing membrane.

### 3.10 WALKWAYS

A. Install walkways in the areas indicated on the roof plans. Walkways are to consist of Sopralene Flam 350 fully adhered to the roof membrane. Embed cap ply granules prior to walkway installation.

### 3.11 QUALITY CONTROL

A. The roof membrane and flashing systems after installation shall be free of the following defects:
1. Factory splices in the top ply shall be cut out before the roll is applied. As an alternate, the
   splices may be covered with a full width section of top ply membrane which extends a
   minimum of 6-inches beyond both sides of the splice.

2. Contractor shall ensure that the top ply is continuously welded and fully bonded to the
   bottom ply without air pockets, wrinkles, fishmouths or tears.

3. Contractor shall evaluate all lap seams in the top and bottom plies to identify any deficient
   conditions which require repair to ensure continuous bonding of the laps.

4. Contractor shall keep foot traffic and equipment movement over newly installed roof
   membrane top and bottom plies to the absolute minimum during application of the roof
   membrane while the bitumen is hot and fluid.

5. All vertical end terminations in wall base flashings shall be covered with metal flashing or
   counterflashing and secured in accordance with the project documents.

6. All roof drains shall be cleaned out and free of roofing debris and tested for watertightness
   and free flowing operation prior to acceptance of roof.

7. Owner shall reject any work not found to be in conformance with good roofing practice or
   these specifications.

8. Roof cement, unless specifically approved by the roof membrane manufacturer in standard
   published details, shall not be incorporated into the roof membrane or flashing. Use of
   roof cement will not be permitted at the following conditions:

   a. Sealing of laps in membrane or flashing.

   b. Surface or stripping flashing at equipment penetrations or drains.

   c. Repairs of the membrane or flashing.

9. All roof cement found on the exposed roof shall be removed and area repaired at no
   additional cost to the Owner.

10. Loose granules shall be embedded in asphalt bleed out at side and end laps which exceeds
    one quarter (1/4) inch in width and at asphalt spillage, drippage, marring, etc. on finished
    membrane surfaces.

3.12 SHEET METAL - GENERAL

A. The Contractor shall examine the areas and conditions under which the flashing and sheet metal
   is to be installed, and notify the Owner in writing of conditions detrimental to the proper and
   timely completion of this phase of the work. Do not proceed with this phase until the
   unsatisfactory conditions have been corrected. Commencement of work shall be construed as
   acceptance of the conditions.
B. Workmanship shall conform to the best trade standards. Soldering shall be performed slowly with heavy well heated soldering coppers of blunt design, properly tinned before use. Tin edges of each item to be soldered, 1-1/2 inches on both sides, with rosin as flux.

C. Extend counterflashings 4 inches (minimum) over base flashings or as noted on drawings if more stringent requirements noted.

D. Installation of items not shown in detail or not covered by specifications shall meet the applicable requirements of the latest edition of the Architectural Sheet Metal Manual of the Sheet Metal and Air Conditioning Contractors National Association, Inc. and/or the requirements of the material or equipment manufacturer.

E. Apply modified plastic cement compound, approved for use by roof membrane manufacturer, between embedded metal flashings and bituminous membrane flashings.

F. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

G. Surfaces of new metal flashing which will come into contact with dissimilar metal shall receive a heavy protective coating per the metal producer's or supplier's recommendations to provide protection against galvanic corrosion.

3.13 SHEET METAL INSTALLATION

A. General:
   1. Installation shall comply with the drawings.
   2. Where not specifically indicated on the drawings, installation shall comply with the recommendations of the SMACNA Manual or with the manufacturer's requirements for premanufactured flashings.
   3. The flashing and sheet metal work shall be permanently watertight and shall not deteriorate in excess of published limitations of the manufacturer.

B. Thermal expansion shall be provided for in all exposed sheet metal work exceeding 15 feet in running length, except where otherwise indicated:
   1. On flashing and trim, expansion capability shall be provided every 10 feet maximum and located 18 inches from corners and intersections.

C. Fasteners and expansion provisions shall be concealed wherever possible.

D. Provide continuous weathertight sheet metal closures and/or end dams at all end terminations, end joints and corners in wall and curb sheet metal counterflashings.

E. The following shall apply to all termination bar installations:
1. In addition to fastener pattern noted on drawings, secure bar within 2 inches of each end of the bars.

2. Provide 1/8 to 1/4 inch gap between adjacent sections of the bar.

3. Use only continuous straight sections of bar – do not wrap around corners.

3.14 SHEET METAL CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

B. Protection: Contractor shall protect flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

C. Neutralize corrosive soldered joint flux materials immediately upon completion of the work at each soldered joint or seam.

3.15 CLEANING AND PROTECTION

A. Daily clean up, and removal from the site, of all wrapping, empty containers, loose particles and other debris resulting from these operations is required. Remove any loose pieces from the drain areas and protect the drains from blockage by debris. Remove drain protection at the end of each work day and prior to arrival of inclement weather to ensure that all drain lines are open.

B. Schedule sequence of work so that traffic over new membrane is minimized. Institute required procedures for protection of completed membrane during installation of work over membrane and throughout remainder of construction period. Contractor shall not allow excessive or concentrated traffic over unprotected membrane.

3.13 SPECIAL ROOFING INSTALLER’S WARRANTY

A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <Insert name of Owner.>
2. Address: <Insert address.>
3. Building Name/Type: <Insert information.>
4. Address: <Insert address.>
5. Area of Work: <Insert information.>
6. Acceptance Date: <Insert date.>
7. Warranty Period: [Two] <Insert number> years.
8. Expiration Date: <Insert date.>

B. AND 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,

C. 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.

D. 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. peak gust wind speed exceeding 105 mph;
c. fire;
d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
e. faulty construction of skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
f. vapor condensation on bottom of roofing; and
g. 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 have been paid by Owner or by another responsible party so designated.

3. 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, 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. 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.

E. Two years after substantial completion the Roofing Installer shall return to the site and replace all broken and missing slates at no cost to the owner.

F. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.

Authorized Signature: <Insert signature.>

Name: <Insert name.>

Title: <Insert title.>

END OF SECTION
SECTION 07 56 00
FLUID APPLIED MEMBRANE

PART 1 GENERAL

1.1 SUMMARY
A. This section specifies all labor, materials, transportation, equipment and services necessary to assemble a complete reinforced fluid applied roofing membrane as shown on the Drawings and described herein.
   1. This specification describes installation of Decothane, an aliphatic, moisture curing cold fluid applied urethane membrane for use over limited areas of stonework and other substrates.

B. Related Sections
   1. N/A

1.2 REFERENCES
A. Factory Mutual (FM Global) - Approval Guide
B. American Society for Testing and Materials (ASTM) - Annual Book of ASTM Standards
C. National Roofing Contractors Association (NRCA)
D. American Society of Civil Engineers (ASCE)

1.3 DEFINITIONS
A. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Roofing Manual for definitions of roofing terms related to this section.

1.4 PERFORMANCE REQUIREMENTS
A. Provide an installed membrane that does not permit the passage of water, and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.

B. A single manufacturer shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

1.5 SUBMITTALS
A. Provide product data sheets for each type of product indicated in this section.

B. Provide manufacturers standard details and approved shop drawings for all detail conditions that exist at the site for the specified system.
C. Installer shall provide written documentation from the manufacturer of their authorization to install the system, and eligibility to obtain the warranty specified in this section.

D. Certification showing full time quality control of production facilities and that each batch of material is tested to ensure conformance with the manufacturer's published physical properties.

E. Manufacturer’s certification that all roofing system products meet current Volatile Organic Compound (VOC) regulations as established by the State in which they are being installed; and stating total VOC content, in grams per litre, for all system components (i.e. primers, adhesives, coatings, etc.).

F. Mock-Up:
   1. Contractor shall provide a minimum of five (5) mock-ups of the complete fluid applied membrane.
   2. Contractor shall provide an additional five (5) mock-ups of the complete fluid applied membrane to allow the Owner to select the color.
   3. Each Mock-Up shall be a minimum of 2’x 2’.

1.6 QUALITY ASSURANCE

A. Manufacturer’s Qualifications: Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:
   1. Membrane Manufacturer must show evidence that the specified membrane has been manufactured by the same organization or direct affiliate for fifteen (15) years.
   2. Membrane Manufacturer shall have available an in-house technical staff to assist the contractor, when necessary, in application of the products and final inspection of the assembly.

B. Installer’s Qualifications: The Contractor shall demonstrate qualifications to perform the work of this Section by submitting the following documentation:
   1. Certification or license by the roofing membrane manufacturer as an authorized applicator of the product the installer intends to use.

C. Source Limitations: All components listed in this section shall be provided by a single manufacturer or approved by the primary roofing manufacturer.

D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation
   1. Build mockup as shown on Drawings, including attachments, and accessories.
   2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Final Inspection: Manufacturers representative shall provide a comprehensive final inspection after completion of the roofing system. All application errors must be addressed and final punch list completed.
1.7 PRE-INSTALLATION CONFERENCE

A. Prior to scheduled commencement of the roofing installation and associated work, conduct a meeting at the project site with the installer, architect, owner, membrane manufacturer representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions and agreements reached (or disagreements), and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to roofing work.

1.8 REGULATORY REQUIREMENTS

A. All work shall be performed in a safe, professional manner, conforming to all federal, state and local codes.

B. All roofing system components shall meet current VOC regulations as established by the State in which they are being installed; and stating total VOC content, in grams per litre, for all system components (i.e. primers, adhesives, coatings, etc.)

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver all roofing materials to the site in original containers, with factory seals intact.

B. Store all pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.

C. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.

D. Materials shall be stored above 55°F (12.6°C) a minimum of 24 hours prior to application.

1.10 PROJECT CONDITIONS

A. Weather
   1. Proceed with roofing only when existing and forecasted weather conditions permit.
   2. Membrane application can proceed when precipitation is imminent if specifically allowed by the material manufacturer. Written confirmation of this fact is required prior to acceptance of the installed materials and any blemishes due to precipitation, either aesthetic or functional, must be repaired.
   3. Ambient temperatures must be above 32°F (0°C) when applying the system.
   4. Ambient temperatures must be more than 5°F above the dew point when applying the system.

B. All surfaces to receive the membrane shall be free from visible water, dew, frost, snow and ice.

C. Application of membrane must be conducted in well ventilated areas.

D. Over its service life, do not expose membrane to a constant temperature below -140°F (-40°C) or in excess of 140°F (60°C) (i.e., hot pipes and vents or direct steam venting, etc.).

E. Consult container or packaging labels and Material Safety Data Sheets (MSDS) for specific safety information.
F. Any exposure to foreign materials or chemical discharges must be presented to membrane manufacturer for evaluation to determine any impact on the waterproof membrane assembly performance prior to warranty issuance.

1.11 WARRANTY

A. Special Manufacturer’s Warranty: Manufacturer’s standard form in which waterproofing manufacturer agrees to repair or replace waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
1. Warranty does not include failure of waterproofing due to failure of substrate prepared and treated according to requirements or formation of new joints and cracks in substrate that exceed 1/16 inch (1.6 mm) in width.
2. Warranty Period: Twenty years from date of Substantial Completion.

B. Special Installer’s Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of two years.

PART 2 PRODUCTS

2.1 ACCEPTABLE PRODUCTS

A. Liquid Plastics, Inc. - Decothane
Liquid Plastics, Inc.
79 Bradley Street
Middletown, CT 06457
Attn: Frank Dippolito
Phone: 201-739-9698
Fax: 201-768-9420

B. Substitutions: As Submitted and Approved prior to bid. No alternates will be considered after bid due date.

2.2 SUBSTRATE REPAIR

A. N/A

2.3 ADHESIVES, SEALANTS AND PRIMERS

A. Metal, Concrete, Masonry or Wood:
   1. Primer as recommended by material manufacturer.

B. One part polyurethane sealant suitable for sealing reglet terminations, cracks and providing a suitable transition between the roofing system and roof penetrations prior to the installation of the membrane system. Meets or exceeds ASTM C-920-87, Type S, Grade NS, Class 25

2.4 FLUID APPLIED MEMBRANE MATERIALS

A. Random woven fiberglass mat for total reinforcement of the roofing membrane system, which provides impact resistance and resistance to excessive thermal and structural movement while maintaining elasticity and membrane film integrity.

B. Cold, fluid applied membrane meeting the following physical properties:
<table>
<thead>
<tr>
<th>Physical Property</th>
<th>ASTM</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength (break)</td>
<td>ASTM D-412</td>
<td>270 lb. / in.2 (Dumbbell)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,000 lb. / in.2 (Straight)</td>
</tr>
<tr>
<td>Elongation (maximum)</td>
<td>ASTM D-412</td>
<td>210% (Dumbbell)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>180% (Straight)</td>
</tr>
<tr>
<td>Accelerated Weathering (3,000 hours)</td>
<td>ASTM G-53</td>
<td>No effect</td>
</tr>
<tr>
<td>Water Vapor Transmission</td>
<td>ASTM E-96</td>
<td>0.033 perm-inches</td>
</tr>
<tr>
<td>Flexibility (1/8” Mandrel Bend)</td>
<td>ASTM D-522</td>
<td>62%</td>
</tr>
<tr>
<td>Tear Strength</td>
<td>ASTM D-624</td>
<td>33 lb. / in.</td>
</tr>
<tr>
<td>Taber Abrasion Resistance</td>
<td>ASTM D-4060</td>
<td>89 mg.</td>
</tr>
<tr>
<td>Hardness (Durometer)</td>
<td>ASTM D-2240</td>
<td>82 (Shore A)</td>
</tr>
</tbody>
</table>

2.5 FLASHING MATERIALS

A. The fluid-applied membrane system is seamless and self-flashing.

PART 3 EXECUTION

3.1 INSPECTION

A. Verify that the surfaces and site conditions are ready to receive work.

B. Verify that the substrate is supported and secured.

C. Verify that the substrate is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters.

D. Verify that the substrate surfaces are dry and free of ice or snow.

E. Verify that all penetrations through the substrate are solidly set.

3.2 SUBSTRATE PREPARATION

A. Existing Materials
   1. Suitable materials for recover shall be free of dust, dirt, debris, and any contaminants that may adversely affect the performance of the new roof. Areas of substantial deck deflection or membrane imperfections shall be corrected prior to installing any new roofing.
   2. Manufacturer must provide written acknowledgment that existing roofing roofing and sealant materials may remain. If no written documentation is provided, all existing roofing and sealant materials must be removed.
   3. Contact material manufacturer for written approval and technical requirements prior to beginning installation of material.
3.3 INSTALLATION - GENERAL

A. Install roofing system according to all current application requirements in addition to those listed in this section.

3.4 FLUID APPLIED MEMBRANE APPLICATION

A. Surface Preparation:
   1. Metal
      a. All exposed metal surfaces to be coated must be cleaned by power tool cleaning (SSPC SP-3) or abrasive blasting methods (SSPC SP-10) to remove all corrosion deposits back to a clean, bright metal.
      b. Fill any gaps or voids at the juncture of the deck penetrations with a single component polyurethane sealant, and allow to cure per manufacturer’s instructions prior to overcoating with the roofing system.

B. Priming
   1. Existing Roofing Materials
      a. Roofing membrane may be applied to a multitude of substrates including, but not limited to old bituminous based waterproofing materials, modified bitumens, plywood, EPDM, PVC, TPO, metal, et. al. Do not apply over coal tar pitch, unless previously approved, in writing, material manufacturer.
      b. Metallic
         a. Apply primer to previously prepared metal by brush, roller or airless spray at a rate of 175-200 SF/gallon, to achieve an overall wet film thickness of 6-8 mils. High porosity and roughness of the substrate will decrease coverage rates.
         b. Allow to cure and dry in accordance with manufacturer’s instructions.

3.5 MEMBRANE APPLICATION INCLUDING ANTI-SKID FINISH

A. The following Decothane system is specified for this project:

<table>
<thead>
<tr>
<th>Delta 25 Year System</th>
<th>Film Thickness (wet mils)</th>
<th>Est. Coverage Rate (sf/gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decothane SP Base Coat</td>
<td>45</td>
<td>28-32*</td>
</tr>
<tr>
<td>Decothane SP Intermediate Coat</td>
<td>30</td>
<td>45-50*</td>
</tr>
<tr>
<td>Decothane SP Top Coat</td>
<td>30</td>
<td>45-50*</td>
</tr>
</tbody>
</table>

* Note: Coverage rates do not include wastage. Rough and textured substrates can affect coverage rates.

1. The Decothane embedment coat shall be applied to all horizontal and vertical surfaces by 1/2” - 3/4” nap roller, brush or airless spray to achieve minimum wet film thicknesses as outlined below.

<table>
<thead>
<tr>
<th>Delta 25 Year System</th>
<th>Film Thickness (wet mils)</th>
<th>Est. Coverage Rate (sf/gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decothane SP Base Coat</td>
<td>45</td>
<td>28-32*</td>
</tr>
</tbody>
</table>
2. While the Decothane embedment coat is still wet, immediately lay precut lengths of Reemat Premium conformable reinforcing scrim into the wet Decothane embedment coat, and using a short nap roller with the appropriate roller frame and handle, roll the scrim to force the wet coating up through the scrim to achieve full saturation and embedment. Add additional material, if necessary, to ensure that the mesh is fully saturated without any visible pinholes.

3. Minimum overlap of the Reemat Premium reinforcement mesh shall be 2” in all directions. Reinforcement shall turn up all adjacent wall surfaces, etc. until the termination point is accomplished according to the project details and specifications. Membrane terminations should be finalized prior to project start-up and documented in shop drawings, but in general, terminations should occur in raked out mortar joints, saw cut terminations, and where feasible, under installed counter-flashing materials. Tape lines must always be used to achieve a straight and professional looking edge detail.

4. Allow the Decothane embedment coat to cure and dry prior to the next application procedure.

5. Apply Decothane intermediate coat by 1/2” - 3/4” nap roller, brush or airless spray to achieve minimum wet film thicknesses, as outlined below.

<table>
<thead>
<tr>
<th>Delta 25 Year System</th>
<th>Film Thickness (wet mils)</th>
<th>Est. Coverage Rate (sf/gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decothane SP Int. Coat</td>
<td>30</td>
<td>45-50*</td>
</tr>
</tbody>
</table>

6. Apply Decothane top coat by 1/2” - 3/4” nap roller, brush or airless spray to achieve minimum wet film thicknesses, as outlined below.

<table>
<thead>
<tr>
<th>Delta 25 Year System</th>
<th>Film Thickness (wet mils)</th>
<th>Est. Coverage Rate (sf/gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decothane SP Top Coat</td>
<td>30</td>
<td>45-50*</td>
</tr>
</tbody>
</table>

3.6 FLASHINGS

A. Ducts/Pipes/Conduits/etc...:
   1. Terminate the fluid applied membrane at a tape-line to ensure a clean edge.
   2. Metal counterflashings are to be installed as shown in the contract documents.

3.7 ROOF PROTECTION

A. Protect all partially and fully completed roofing work from other trades until completion.

B. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas.
C. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed roof areas from traffic and point loading during the application process.

D. Temporary tie-ins shall be installed at the end of each workday and removed prior to commencement of work the following day.

3.8 CLEAN-UP

A. All work areas are to be kept clean, clear and free of debris at all times.

B. Do not allow trash, waste, or debris to collect on the roof. These items shall be removed from the roof on a daily basis.

C. All tools and unused materials must be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.

D. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.

E. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.

F. Clean and restore all damaged surfaces to their original condition.

END OF SECTION
PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Supply, fabrication, and installation of flashings as shown in the drawings, including but not limited to:
1. Gravel Stop
2. Leaders
3. Scupper

B. Related Sections:
1. Division 7 Sections

1.2 REFERENCES

1. ASTM International:
   c. B601: Classification for Temper Designations for Copper and Copper Alloys-Wrought and Cast.
2. Sheet Metal and Air Conditioning Contractors’ National Association (SMACNA).
3. Copper and Common Sense by Revere Copper Products, Inc.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordinate Work to ensure that adjacent areas are not adversely affected. Coordinate:
1. With Owner’s Representative.
2. With other trades:
   a. To ensure that work done by other trades is complete and ready for sheet-metal Work.
   b. To avoid or minimize work on, or in immediate vicinity of, sheet-metal Work in progress.
   c. To ensure that subsequent work will not adversely affect completed sheet-metal Work.
3. With interfacing and adjoining construction to provide leakproof, secure, and non-corrosive installation. Coordinate:
   a. Installation of roof drainage system with installation of roof perimeter flashing.
   b. Counterflashing installation with base flashing installation.
   c. Installation of roof-penetration flashing with installation of roofing and other items penetrating roof.

B. Samples: For each type of sheet-metal flashing and trim. Construct typical lap splice or seam for mechanically-jointed systems, and solder lap or seam for field-solderable systems.
C. Installer Qualifications: If requested, evidence that Installer’s existing company has minimum five years of continuous experience in similar sheet-metal Work; list of at least five representative, successfully-completed projects of similar scope and size, including:
   1. Project name.
   2. Owner’s name.
   3. Owner’s Representative name, address, and telephone number.
   4. Description of work.
   5. Sheet-metal members installed.
   6. Project supervisor.
   7. Total cost of sheet-metal work and total cost of project.
   8. Completion date.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Experienced firm that has successfully completed sheet-metal work similar in material, design, and extent to that indicated for Project. Must have successful installations of specified materials in local area in use for minimum of five years.
   1. Employ foreman with minimum five years of experience as foreman on similar projects, who is fluent in English, to be on Site at all times during Work. Do not change foremen during the course of the Project except for reasons beyond the control of the Installer; inform Architect/Engineer in advance of any changes.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Sheet-Metal Members: Deliver, store, and handle materials in such a manner as to prevent damage to materials or structure.

B. Sealants, Coatings, and Miscellaneous Materials:
   1. Deliver materials to Site in original containers and packaging with seals unbroken, labeled with manufacturer’s name, product brand name and type, date of manufacture, lot number, and directions for storing.
   2. Keep materials dry and do not allow materials to be exposed to moisture during transportation, storage, handling, and installation. Reject and remove from Site new materials which exhibit evidence of moisture during application, or have been exposed to moisture.
   3. Store materials in original, undamaged containers in clean, dry, protected location on raised platforms with weather-protective coverings, within temperature range required by manufacturer. Protect stored materials from direct sunlight. Manufacturer’s standard packaging and covering is not considered adequate weather protection.
   4. Handle materials to avoid damage.
   5. Conspicuously mark damaged or opened containers or containers with contaminated materials, and remove from Site as soon as possible.
   6. Remove and replace materials that cannot be applied within stated shelf life.

C. Limit stored materials on structures to safe loading capacity of structure at time materials are stored, and to avoid permanent deck deflection.

1.6 PROJECT CONDITIONS

A. Verify existing dimensions and details prior to start of sheet-metal Work. Notify Architect/Engineer of conditions found to be different than those indicated in the Contract.
Documents. Architect/Engineer will review situation and inform Contractor and Installer of changes.

B. Comply with Owner’s limitations and restrictions for Site use and accessibility.

C. Environmental Limitations: Install sheet-metal members when existing and forecast weather conditions permit sealants, coatings, and miscellaneous materials to be installed according to sealant, coating, or miscellaneous material manufacturer’s written instructions and warranty requirements.

D. Handle and install materials in strict accordance with safety requirements required by sheet-metal manufacturer; GHS or Material Safety Data Sheets; and local, state, and federal rules and regulations. Maintain GHS or Material Safety Data Sheets with materials in storage area and available for ready reference on Site.

1.7 CHANGES IN WORK

A. During rehabilitation work, existing conditions may be encountered which are not known or are at variance with the Contract Documents. Such conditions may interfere with the Work and may consist of damage or deterioration of the substrate or surrounding materials that could jeopardize the integrity or performance of the Work.

1. Notify Architect/Engineer of conditions that may interfere with the proper execution of the Work or jeopardize the performance of the Work prior to proceeding with the Work.

1.8 SUBMITALS

A. Required prior to the commencement of work:

1. Detailed shop drawings or full-sized mockups, 12 in. wide minimum, of all new sheet metal. Shop drawings shall include details of all erection and connection methods, expansion joint location and detail, and accessories for all new items required under this Specification.

2. 6” x 6” samples of all materials specified in this section shall be provided for approval.

3. Approval of shop drawings will be for details, and arrangements of the various parts. Verification of job dimensions shall be the sole responsibility of the Contractor.

B. Required after the completion of work:

1. Contractor's warranty per paragraph 1.9.

1.9 WARRANTY

A. Contractor’s Warranty:

1. Written warranty, signed by Contractor, including:

1) Replace sheet-metal Work that does not comply with requirements; that has corroded surface, coating that fails cohesively or adhesively, or other surface defects or imperfections; or that deteriorates in a manner not clearly specified by material supplier’s data as an inherent quality of the material for the application indicated. Warranty includes all materials, labor, tools and equipment necessary for repair, restoration, or replacement of all new work damaged as a result of defects, imperfections, or faults in materials and workmanship.
2) Corrections of defects, imperfections, and faults shall not relieve the Contractor from his/her responsibility for additional corrective work during the remaining time period.

2. Remove and replace sealant that has failed cohesively or adhesively; or that deteriorates in a manner not clearly specified by sealant manufacturer’s data as an inherent quality of the material for the application indicated.

3. Repair or replacement, to satisfaction of Owner, of other work or items which may have been displaced or damaged as consequence of defective Work.

4. Warranty does not include deterioration or damage from changes in sheet-metal environment from that reasonably anticipated at Substantial Completion, or physical damage from adjacent activities.

5. Warranty Period: Two years after Substantial Completion date.

B. Warranty on Aluminum Finish
1. Kynar finish on aluminum shall be guaranteed against fading, cracking and peeling for a period of five years.

PART 2 PRODUCTS

2.1 SHEET METAL

A. Copper
1. Copper shall be cold rolled temper in conformance with ASTM B370.
   b. Step Flashings for Slate Roofing: 20 oz.

B. Lead Coated Copper:
1. Lead coated copper shall be Type I, Class A, conforming to ASTM B101.
   b. Counter Flashing at Roofing: 16 oz.
   c. Metal Aprons and Crickets: 20 oz.
   d. Chimney Cap: 20 oz.
   e. Gutters: 20 oz.
   g. Flat Seam Roofing and Wall Panels: 20 oz.
   h. Flashing at Slate Ridge: 16 oz.
   i. Flashing at Slate Hips: 16 oz.

C. Aluminum
1. Kynar-coated aluminum Baked on fluoropolymer coating system based on Kynar 500 resin. Color to be non-standard custom color, as selected by the Owner and Architect/Engineer.
   a. Cap flashings at existing curbs: 0.050 inch.
   b. Gravel stop and fascia: 0.050 inch.
   c. Cleats: 0.063 inch

D. LEAD
1. Lead alloy shall contain 4-6 percent Antimony.
   a. Vent Stack Flashing: 4 lb.
   b. Wedges for use in counter flashing shall be formed of 2.5 lb. sheet lead, specifically for the application intended.
2.2 AUXILIARY MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items required for installation.

B. Underlayment Materials:

C. Fasteners: Wood screws, annular-threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads. Size fasteners to provide penetration into substrate of at least 1 1/4 inches for nails and 3/4 inches for wood screws.
   1. Use stainless-steel fasteners, except that copper or hardware bronze fasteners may be used with copper sheet metal.
   2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
   3. Blind Fasteners: High-strength, closed end, stainless-steel rivets. Rivets to receive a dab of solder to insure water tight installation.

D. Butyl Sealant: ASTM C1311, single-component, solvent-release, butyl-rubber sealant; polyisobutylene-plasticized; heavy-bodied for hooked-type expansion joints with limited movement.

E. Solder: Solder for use with copper and lead coated copper: 50/50 tin and lead. ASTM B32.
   1. Flux for copper and lead coated copper: LA-CO MA Stainless Steel Flux.

F. Solder for use with stainless steel: 60/40 tin and lead.
   1. Flux for stainless steel: LA-CO MA Stainless Steel Flux.

2.3 SHEET METAL FABRICATION

A. Custom fabricate to comply with recommendations in SMACNA’s Architectural Sheet Metal Manual, that apply to design, dimensions, metal, and other characteristics of item indicated. Conform to dimensions and profiles shown in SMACNA’s Architectural Sheet Metal Manual, unless requirements that are more stringent are indicated.
   1. Obtain field measurements for accurate fit before fabrication.
   2. Shop fabricate items where practicable.

B. Fabricate without excessive oil canning, buckling, or tool marks that are visually objectionable in opinion of Architect/Engineer, and true to line and levels indicated, with exposed edges folded back to form hems.
   1. Seams: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

C. Expansion Provisions: Use lapped or bayonet-type expansion provisions where possible; otherwise, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

D. Conceal fasteners and expansion provisions, where possible, on exposed-to-view sheet-metal flashing and trim, unless otherwise indicated.
E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, non-corrosive metal, and in thickness not less than that of metal being secured.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions with Installer for compliance with requirements and other conditions affecting performance of sheet-metal flashings and trim.
   1. Ensure that work done by other trades is complete and ready for sheet-metal Work.
   2. Verify that areas and conditions under which sheet-metal Work is to be performed permit proper and timely completion of Work.
   3. Notify Architect/Engineer in writing of conditions which may adversely affect installation or performance of sheet-metal Work and recommend corrections.
   4. Do not proceed with installation of sheet-metal flashings and trim until adverse conditions have been corrected and reviewed by Architect/Engineer.
   5. Commencing sheet-metal Work constitutes acceptance of Work surfaces and conditions.

3.2 PROTECTION

A. Take precautions to ensure safety of people, including building users, passers-by, and workmen, and animals, and protection of property, including adjacent building elements, landscaping, and motor vehicles.

B. Prevent construction debris and other materials from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

C. Protect paving and sidewalks, and adjacent building areas from mechanical damage due to scaffolding and other equipment.

D. Limit access to Work areas.

E. Erect temporary protective canopies, as necessary, over walkways and at points of pedestrian and vehicular access that must remain in service during Work.

F. Assume responsibility for injury to persons or damage to property due to Work, and remedy at no cost to Owner.

3.3 SHEET METAL INSTALLATION

A. General: Install sheet-metal flashings and trim according to recommendations in SMACNA’s Architectural Sheet Metal Manual and as indicated.

B. Install sheet-metal flashing and trim to fit substrates and to result in watertight performance.
   1. Install true to line and levels indicated.
   2. Where exposed, install without excessive oil canning, buckling, or tool marks.
   3. Provide uniform, neat seams with minimum exposure of solder, welds, or sealant.
   4. Do not torch cut sheet metal.

C. Provide for thermal expansion of exposed flashing and trim.
   1. Space movement joints no more than 10 feet apart, with no joint within 24 inches of corner or intersection.
2. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

D. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

E. Anchor sheet-metal flashing and trim and other components of Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required.
   1. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners

F. Soldered Joints: All seams of copper and lead coated copper materials shall be soldered. Soldering shall be done in accordance with the recommendations in ‘Copper and Common Sense’. All soldered seams must be soldered with an iron. The use of torches without an iron is reason for immediate rejection of all soldering work. All soldered seams on inclined surfaces shall be laced after seam is fully sweated.

G. Seal all cut edges of self-adhered membrane underlayment with manufacturer’s recommended compatible sealant or mastic.

3.4 CLEANING

A. At the end of each workday, clean Site and Work areas and place rubbish, empty cans, rags, and other discarded materials in appropriate containers.

B. After completing sheet-metal Work:
   1. Clean spillage and soiling from adjacent surfaces using cleaning agents and procedures recommended by manufacturer of affected surface. Exercise care to avoid scratching or damage to surfaces.
   2. Repair surfaces stained, marred, or otherwise damaged during roofing Work.
   3. Clean up debris and surplus materials and remove from Site.

3.5 PROTECTION

A. Protect sheet-metal flashings and trim from damage and wear during remainder of construction period.

END OF SECTION
PART 1 - GENERAL

1.1 WORK INCLUDED

A. Prefabricated equipment mounting supports

1.2 RELATED WORK

A. Section 06114 - Wood Blocking and Curbing
B. Section 07503 - Modified Bitumen Roofing and Flashings

1.3 SUBMITTALS

A. Submit shop drawings and product data.
B. Indicate on shop drawings, configuration and dimension of components, adjacent construction, required clearances and tolerances and other affected work.
C. Provide product data on shape of components, materials and finishes, anchor types and locations.
D. Submit two samples. Samples should be a minimum of 3 x 5 in. in size and illustrate the components’ shape, finish and color where representative of a larger area.
E. Submit manufacturer’s installation instructions.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Prefabricated equipment mounting supports:
   1. ThyCurb Model TEMS-1
   2. Or approved equal

2.2 ACCESSORIES

A. Sealants: As recommended by the manufacturer.
B. Adhesives: As recommended by the manufacturer.

2.3 FINISHES
A. Steel: standard color and finish.

PART 3 - EXECUTION

3.1 INSPECTION

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

B. Beginning of installation means acceptance of existing conditions.

3.2 INSTALLATION

A. Install components in accordance with manufacturer’s instructions.

B. Provide watertight closures at all terminations at adjacent walls.

C. Coordinate sheet waterproofing membrane and base flashings with installation of components of this section.

D. Coordinate installation of sealants with work of this section to ensure watertightness.

END OF SECTION
SECTION 07 92 00
JOINT SEALANTS AND WEATHER CAPS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes joint sealants for following applications, including those specified by reference to this Section and indicated on the drawings:

B. Related Sections include the following:
   1. Division 7 Sections

1.2 SUBMITTALS

A. Product Data: For each joint-sealant product and related products indicated. Product data should include material descriptions, installation instructions, and manufacturer’s recommendations and specifications.

B. Samples for Initial Selection: Manufacturer’s color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:
   1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.
   2. Contractor shall install each type of backing material, sealant, primer and other related products at the building for evaluation. The sample shall be accessible or located as indicated by the Owner or Owner’s Representative. The mock-up(s), when approved by the Owner or Owner’s Representative, shall become the standard for the duration of the contract.
   3. No joint-sealant installation shall be performed on the building (structure), until the above specified mock-up is accepted by the Owner’s Representative.

1.3 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside below 40 degrees F (5 degrees C), or expected to be below 40 degrees F within 12 hours.
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
5. When joint preparation, which may include cleaning substrate surfaces, removing inclusions, and repairing substrate surfaces have not been performed or performed adequately.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, primers 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 on similar projects, preconstruction testing for this project and field experience.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each cured single- or multicomponent cold applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Joint Sealant in Contact with Masonry: Single-component, Non-sag, Non-staining Silicone Sealant to be used at non-paintable surfaces. Provide the following or approved equal.
   1. 756 Silicone Building Sealant, manufactured by Dow Corning Corporation. Color selected by Owner or A/E.

C. Metal/Glass Joint Sealant: Silicone, Grade NS, Type S, Class 50 conforming to ASTM C920. Provide the following or approved equal.
   1. 795 Silicone Building Sealant, manufactured by Dow Corning Corporation. Color selected by Owner or A/E.

2.4 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.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.


D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or
joint surfaces at back of joint where such adhesion would result in three-sided adhesion. Provide self-adhesive tape where applicable.

2.5 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 joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.


D. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 EXECUTION

3.1 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. Installation of sealant materials constitutes the Installer’s acceptance of the joint conditions.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer’s written instructions 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, moisture, surface dirt, and frost. Verify that substrates are dry. Provide measures to prevent the wetting of the joint substrates prior to the installation of the sealant.

2. Clean 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 after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   a. Concrete.
   b. Masonry.
   c. Wood products

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass.

B. Joint Priming: Prime joint substrates based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer’s written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces. Substrates should be primed prior to the installation of the backer rod.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer’s written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Use the proper size backer rod. Do not braid multiple back rods together to form a larger diameter backer rod.
   4. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
   5. Install backer rod with a device that will provide a consistent depth between the face of the substrate and the outer surface of the backer rod. Adjustable tools are available for installing backer rod to various depths.
   6. Use the appropriate sized backer rod for each joint width. Do not place multiple backer rods; or braided backer rods into joints to accommodate joints that are wider than the backer rod on hand.

C. Install bond-breaker tape at back of joints where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Joints should be tooled with a concave surface, compressing the sealant into the joint.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3.4 INSTALLATION OF LEAD WEATHERCAPS

A. Install lead T Caps in full compliance with manufacturer’s printed instructions. Select type and size according to manufacturer’s recommendations.
   1. Rake back and cut out joint to a depth to accommodate backer rod and T cap + 1/4 inch.
   2. The raked joint and adjacent stonework shall be clean, dry and free of all mortar, dust and old caulk or sealant. Prepare as per normal sealant joint as specified above.
   3. Mark off width of selected T cap on stone and apply masking tape prior to installation.
   4. Notch, pre-fit, and contour T cap in stone. Lift out and prime same as required.
   5. Seat backer rod at specified depth. Prime stone as required.
   6. Fill joint solidly to an excess of 1/8 inch above adjacent masonry surface. Seat pre-contoured T cap and press down to a firm bed so that bonding grooves on the underside are solidly filled and no voids exist.
   7. Strip off excess sealant and, when set, remove masking tape.

B. Install type ‘A’ lead T caps at all cross joints on horizontal ledge, cornice, and parapet locations indicated on the Drawings. Carry T caps down at least one inch onto vertical front faces or to first change in contour if within three inches.

C. Install type ‘B’ lead T caps at joints between horizontal and vertical masonry surfaces where indicated on the Drawings.

3.5 CLEANING

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

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants 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 installations with repaired areas are indistinguishable from original work.

END OF SECTION
SECTION 22 14 23  
ROOF DRAINAGE  

PART 1 GENERAL  

1.1 SUMMARY  
A. The principal items of work are related to removal and replacement of existing roof drains, installation of new drains at new locations, work called for by the Drawings, and performing other work necessitated by these operations, including roof deck cutting and patching resulting from these operations.  

1.2 RELATED WORK  
A. Section 07 50 30 - Modified Bitumen Roofing  
B. Section 02 42 00 - Selective Demolition  

1.3 SUBMITTALS  
A. Submit list of all materials proposed for use. Submit technical data sheet for each manufactured product.  

1.4 QUALITY ASSURANCE  
A. All work shall be performed by journeymen skilled in the particular task being performed. Where licensing is required such journeymen shall hold valid licenses.  

1.5 REFERENCE STANDARDS  
B. Cast Iron Soil Pipe Institute:  
C. American National Standards Institute:  

1.6 DELIVERY, HANDLING AND STORAGE  
A. Handle products carefully to avoid damage to hubs, ends or roof drain components.
PART 2 PRODUCTS

2.1 PIPE AND FITTINGS

A. Pipe and fittings shall be Service Class, gray cast iron.
   1. Pipe for replacement of existing pipe shall match size of existing.
   2. Pipe ends shall be hubless.

B. Jointings:
   1. Lead/Oakum caulked joints at drain bowl connection shall comply with governing regulations for use in the service required.
   2. Hubless jointings, complying with CISPI 310-90: No-Hub Coupling Assembly, manufactured by Tyler Pipe/Soil Pipe Division, sized to fit the application.

2.2 ROOF DRAINS

A. Drains:
   1. Zurn Z100 15 inch diameter roof drain
   2. Approved Equal

B. Diameter of drain outlet: Match diameter of existing leaders.

C. Drain components and accessories:
   1. Cast Iron Dome
   2. Flashing Clamp
   3. Under-Deck Clamp
   4. Sump Receiver Pan

D. Outlet shall be Inside Caulk using lead and oakum.
   1. Inside rubber gasket connections for hub and spigot pipe ends are not permitted.

2.3 ACCESSORY MATERIALS

A. Pipe insulation: Match existing on adjacent similar pipe.

PART 3 EXECUTION

3.1 GENERAL

A. Perform removal of existing and installation of new drains from above and below the deck to complete the required operations.

B. Coordinate with the Owner when interior access for drain work is necessary. Notify the Owner 48 hours prior to such work.

C. Extreme care shall be taken not to damage interior finishes in any way. If damaged, the Contractor shall make all repairs required to the acceptance of the Owner at no expense to the Owner.
3.2 ROOF DRAIN INSTALLATION

A. Remove existing roof drains and receiver pans.
   1. Remove vertical leader to next connection only if necessary.

B. Fasten new receiver pan in place.
   1. Set new drain in place level with the metal deck using a new sump receiver and secure in place with underdeck clamp.

C. Furnish and install the flashing clamp and dome of the drain.

3.3 PIPING OF ROOF DRAIN - LEAD JOINTS

A. For connection between drain bowl and outlet pipe.

B. Tightly pack the joint with Oakum. Do not permit packing to enter bore of the finished joint. Clean joint after packing.

C. Fill remaining joint space with one pouring of lead to a minimum one-inch depth measured from face of bell. Surface shall not be depressed more than 1/8-inch below the rim of the hub. After lead has cooled, caulk joint tightly with hammer and caulking iron.

3.4 PIPING OF ROOF DRAIN - NO-HUB COUPLING

A. For connection between outlet pipe and existing drain line.

B. Clean the external surface of the ends of the pipe and/or fitting to be joined so they are free of foreign material.

C. Install the no-hub coupling in accordance with manufacturer's instructions, summarized below.
   1. Place the gasket on the end of one pipe or fitting and the stainless steel clamp assembly on the end of the other pipe or fitting.
   2. Firmly seat the pipe or fitting ends against the integrally molded shoulder inside the rubber gasket.
   3. Slide the clamp assembly into position over the gasket and tighten the bands as described below.
   4. Torquing Bands: Use a properly calibrated torque wrench, set at the torque recommended by the coupling manufacturer.

3.5 PIPING OF ROOF DRAIN - PIPE INSTALLATION

A. Remove vertical leader to next connection and install new pipe section to connect drain to drainage piping.

3.6 CLEANING DRAIN LEADERS

A. Upon completion of drain replacement and tie-in to the roofing system, conduct cleaning of drain lines to ensure any blockages or narrowing of the drain leaders have been cleared.

B. Cleaning shall be done by a professional plumbing contractor using specialized equipment specifically designed for drain cleaning by hydro jetting and/or rooting.
C. Upon completion of cleaning, contractor shall certify that drains have been cleaned. The contractor shall report to the Owner/Architect/Engineer any deficiencies with the roof leader plumbing system that might affect drainage or flow of water through the drainage system.

3.7 WATER TEST
A. Water test new piping and joints upon completion of drain installation.
   1. Plug drain line at nearest location in existing pipe that was unaffected by drain replacement.
   2. Fill pipe with water and let stand for minimum two hours.
   3. Check for leaks.
   4. If leaks occur, disassemble and form new joint prior to retesting. Repeat steps 1-3 above until the installation is leak free.

3.8 CLEANING
A. Keep the roof clean of rubbish and unused materials. At the end of each day's work remove all rubbish, debris and surplus materials caused by the work of this Section.

END OF SECTION