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PART 1 - GENERAL

1.1 SUMMARY

- A. This Section discusses the minimum requirements necessary for general coordination and precautionary measures which are to be undertaken by the Contractor during the progression of work generally specified as follows.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 PROJECT COORDINATION AND SCHEDULING

- A. The Contractor shall coordinate all construction activities with the Owner, including but not limited to demolition and window and siding installation, as necessary to minimize disruption with facility operations. Sufficient notice shall be provided by the Contractor as necessary for the Owner to make the necessary arrangements to relocate personnel and tenants surrounding areas of work. Notifications shall be provided minimum of 48 hours prior to the scheduled work.
- B. Prior to the commencement of work, the Contractor shall submit a construction schedule to the Owner establishing the sequencing of work. Construction operations shall be scheduled in such a manner to accommodate the Owner and minimize disruption to facility operations.

3.2 PRECAUTIONARY MEASURES

- A. The Contractor shall undertake all necessary precautions to avoid interference and/or disturbance of existing construction to remain. Any damage shall be repaired at the Contractor's expense.

3.3 PROTECTION AND CLEANING

- A. The Contractor shall maintain an uninterrupted means of building egress and roadway access at all times until completion of the work.
- B. The contractor shall attend weekly job progress meetings with the Owner to discuss construction scheduling.

END OF SECTION 01051

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PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section shall be governed by the Contract Documents. Provide materials and services necessary to furnish and deliver the work of this Section as specified herein, and/or as required by job conditions.

1.2 SHOP DRAWINGS AND PRODUCT DATA

- A. Definitions
  1. Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, Manufacturer, Supplier or Distributor to illustrate some portion of the work.
  2. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the work.
  3. Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the work will be judged. See Schedule of Samples under each Section of the Specifications.
- B. The Contractor shall review, approve and submit, within seven (7) days after receipt thereof and in such sequence as to cause no delay in the Work or in the Work of the Owner or any separate contractor, all Shop Drawings, Product Data, Samples and Certificates required by the Contract Documents.
- C. By approving and submitting Shop Drawings, Product Data Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated with information contained within such submittal with the requirements of the Work of the Contract Documents.
- D. The Contractor shall "not be relieved of responsibility" for any deviation from the requirements of the Contract Documents by the Engineers review of Shop Drawings, Product Data or Samples unless the Contractor has specifically informed the Engineer in writing of such deviation at the time of submission and the Engineer has given written notice to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Engineer's review thereof Contract Documents indicate the work to be performed.

SECTION 01300  
SUBMITTAL, PRODUCTS, SUBSTITUTIONS

- E. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples to revisions other than those requested by the Engineer on previous submittal.
- F. No portion of the Work requiring submission of a Shop Drawing, Product Data or Samples shall be commenced until the submittal has been reviewed by the Engineer. All such portions of the Work shall be in accordance with reviewed submittal.

1.3 SUBMISSION PROCEDURES

- A. After the date specified for commencement of work the Contractor, within a mutually agreed to time with Engineer and Owner, -shall submit a shop Drawing Schedule to the Engineer, This schedule shall be broken down into the various items of work and shall list a "Begin" date and a "Complete" date for Shop Drawing Submission.
- B. Submit to the Engineer Shop Drawings, Product Data and Samples in sufficient time to allow at least fifteen (15) working days for review. Submittal shall be checked and signed by the Contractor prior to submission to indicate that the Contractor has coordinated the work and that it conforms to the Contract Documents.
- C. When catalog cuts, brochures, product data or other printed data are sent to the Engineer for review, a minimum of four (4) copies of each shall be submitted.
- D. The quantities and types of samples are listed in each Section of the Specifications.
- E. Each Shop Drawing shall contain a title block with provisions for the following:
  - 1. Number and title of drawing.
  - 2. Date of drawing and revision
  - 3. Name of project building or facility.
  - 4. Name of Contractor or Subcontractor submitting drawing.
  - 5. Specification Section title and number,
  - 6. Space for Engineer's stamp and received stamps (511x511').
- F. Each Shop Drawing shall have listed on it all contract reference drawing numbers plus shop drawing numbers on related work by other Subcontractors if available. The Engineer's drawings may not be reproduced and submitted as Shop Drawings, unless consent is obtained from the Engineer in writing prior to such use.

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- G. Each Shop Drawing submission shall have indicated on the Drawing a submission number (whether first, second, third, etc.) and each submission after the first submission shall be clear of all previous stamps.
- H. Shop Drawings for work of one trade shall be checked by Subcontractors of related trades if available, and shall have received their stamp of approval, before being submitted to the Engineer.
- I. Shop Drawings which involve change or variances with Contract Documents shall be so noted by the Contractor, and the Owner and Engineer shall be advised in writing of the recommended change and reasons for such changes.

1.4 ENGINEER'S ACTION

- A. After the completion of his checking, the Engineer will return the (2) two copies of shop drawings to Contractor marked in one of the following ways. As explained below.

With notation as follows:

corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the Contract Documents, The Contractor is responsible for confirming and correlating all quantities and dimensions- selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades-, and performing his work in a safe and satisfactory manner.

B. EXPLANATION OF COMMENTS

- 1. No Exceptions Taken: No corrections, contractor may proceed with the work; only these drawings should be used for fabrication and in the field.
- 2. Comment Attached, Resubmit: minor amount of corrections; all items can be fabricated in accordance with notes; review is completed; record copy incorporating the minor changes, must be submitted and shall not be considered as a re-submission.
- 3. Rejected: Drawings and/or catalogs are rejected as not in accordance with design concept of the project and information given in the contract documents.
- 4. Remarks: See note on shop drawings review stamp. Changes in shop drawings, other than those noted by Engineer shall be brought to Engineer's attention in writing.

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- C. Shop Drawings that are returned: "Revise and Resubmit" or "Rejected" shall be corrected and resubmitted to the Engineer promptly.
- D. The review of a specific item shall not imply review of an entire assembly of which the item is a component unless the whole assembly is submitted and approved.
- E. Engineer may withhold review on any Shop Drawing until Shop Drawings indicating all related items have been submitted. Submit (and Resubmit) Shop Drawings for such related items as approximately the same date to permit coordinating checking,

1.5 SAMPLES

- A. Submit for review, to the Engineer, samples of materials listed under each Section of the Specification. Samples shall be properly labeled for identification, consisting of the following information-. Job Titles, Sample No, and Submission No.
- B. Do not commence work under Sections of the Specifications until the Engineer's review in writing is obtained for all listed samples.
- C. Do not construe review of advance samples as total guarantee of acceptance of materials. Materials will be submitted to field inspections, from time to time, as work progresses.
- D. Samples of Specific manufactured product shall be accomplished with appropriate manufacturers literature at time of submission.

1.6 PROGRESS SCHEDULE

- A. The Contractor shall prepare a construction schedule in a form acceptable to the Engineer and Owner within two (2) weeks from the execution date of the Contract for the Engineer's and Owner approval.
- B. The progress schedule shall be in the form of a network schedule chart.
- C. The progress schedule shall be updated at least once a month or more frequently, if necessary, should the Project be faced with the threat of delay for any reason. Should changes that have occurred since previous submission of updated schedule, indicate progress of activity, show completion dates.
- D. Furnish the Engineer and the Owner with sufficient copies of the original schedules and all updated schedules as the Owner or Engineer may require.

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- E. After approval of the schedule, the Contractor shall be responsible for seeing that it is adhered to, and for ascertaining that proper coordination is maintained between all work of the Contract.

1.7 SCHEDULE OF VALUES

- A. The Contractor shall submit to the Engineer and Owner a Schedule of Values, on form supplied by Owner, at least ten (10) days prior to submitting the first application for payment
- B. The Schedule of Values shall list the breakdown of the work generally following the Table of Contents of this Specification, with identification of project, issue date, Contractors name and address.
- C. Each item shall be accompanied by a dollar value rounded off to the nearest ten dollars. As requested by the Engineer support values given with data that will substantiate their correctness.
- D. The use of the Schedule of Values shall be only as a basis for Contractor's Application for Payment.
- E. Sum total of all costs of items listed in the Schedule shall be equal to the total contract sum.
- F. The Schedule of Values shall be submitted each month along with the Application for the payment.

1.8 MATERIAL AND EQUIPMENT LIST

- A. Within appropriate time after the date of award of the Contract, the Contractor shall submit for approval a complete list of suppliers, materials and equipment proposed for use in connection with the Project.
- B. After a material piece of equipment has been approved, no change in brand or make will be permitted unless satisfactory written evidence is presented and approved by the Engineer that the manufacturer cannot make scheduled delivery of approved material, or that material delivered has been rejected and the substitution of a suitable material is an urgent necessity, or that other conditions have become apparent which indicate that the approval of such other material is in the best interest of the Owner.

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1.9 PRODUCT ACCEPTANCE STANDARDS

- A. Where the words "or and acceptable equal" or other synonymous terms are used, it is expressly understood that they shall mean that the acceptance of any such submission is vested in the Engineer, whose decision shall be final and binding upon all concerned. All submissions are subject to such review.
- B. The intent of this article is to encourage and permit competition on qualified products by reputable and qualified Contractors, suppliers and manufacturers, whose product, reputation and performance warrant review for the conditions, intent of design and performance considerations.
- C. When descriptive catalog designations including manufacturers name, product brand name, or model number are referred to in the Contract Documents, such designations shall be considered as being those found in industry publications of current issue at date of first invitation to bid.
- D. When standards of the Federal Government, Trade Societies, or Trade Associations are referred to in the Contract Documents by specific date of issue, these shall be considered a part of this contract. When such references do not bear a date of issue, the current published edition at date of first invitation to bid shall be considered as part of this contract, Suppliers need not be a member of such trade societies or associations referred to in the Specifications.
- E. Whenever any product is specified or shown by describing proprietary items, model numbers, catalog numbers, manufacturer, trade names or similar reference, the bidder obligates himself to submit proposals and accepts awards of contract based upon the use of such products. Use of such reference is intended to establish the measure of quality which the Engineer has determined as requisite and necessary for this project, Where two or more products are chosen or specified, the bidder has his option of which to use, provided the product used meets all requirements of specifications and design criteria. The right is reserved to review proposed deviations of design, function, construction or similar differences which will effect the design intent

1.10 SUBSTITUTIONS

- A. Requests for substitution will NOT be considered prior to Bid.
- B. After the Contract has been executed, the Engineer will consider a formal request for the substitution of products in place of those specified under the following conditions:
  - 1. The request is accompanied by complete data an the proposed substitution substantiating compliance with the Contract Documents including product identification and description, performance and test

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SUBMITTAL, PRODUCTS, SUBSTITUTIONS

- data, references and samples where applicable, and an itemized comparison of the proposed substitution with the products specified or named by addenda, with data relating to Contract time schedule, design and artistic effect where applicable.
2. The request is accompanied by accurate cost data on the proposed, substitution in comparison with the product specified, whether or not modification of the Contract Sum is to be a consideration.
- C. Requests for substitution based on paragraph (1) above, when forwarded by the Contractor to the Engineer and Owner, are understood to mean that the Contractor.
1. Represents that he has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.
  2. Will provide the same guarantee for the substitution that he would for that specified.
  3. Certified that the cost data presented is complete and Includes all related costs under this contract, and that he waives all claims for additional costs related to thin substitution which subsequently become apparent and
  4. Will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects, at no additional cost to the Owner and at no extension of the contract completion date.
- D. Substitutions will not be considered if:
1. They are indicated or implied on shop drawings submissions without the formal request required in paragraph (1) above; or
  2. for their implementation they require a substantial revision of the Contract Documents in order to accommodate their use,

END OF SECTION - 01300

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section requires the selective removal and subsequent offsite disposal of all items on the contract drawings as required to complete the work.

1.2 SUBMITTALS

- A. Submit schedule indicating proposed sequence of operations for selective demolition work to the Owner for review prior to start of work.
- B. Take photographs of existing conditions of building surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to the removal operations. File with the Owner prior to start of work.

1.3 JOB CONDITIONS

- A. Occupancy: The units will be occupied during this project. Conditions satisfactory to the building tenants and the Owner must be maintained throughout the work.
- B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.
  - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner insofar as practical.
- C. Partial Demolition and Removal: Items indicated to be removed, but not salvaged but of salvageable value to the Contractor may be removed as the work progresses. Transport salvaged items from site as they are removed.
  - 1. Extended storage or sale of removed items on site will not be permitted.
- D. Protections: Provide temporary barricades and other forms of protection to protect building tenants and the general public from injury due to selective demolition work.
  - 1. Provide protective measures as required to provide free and safe passage of building tenants and the general public to the occupied portions of the buildings.
  - 2. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of any element to be demolished and adjacent facilities or work to remain.
  - 3. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
  - 4. Remove protections at completion of the work.
- E. Damages: Promptly repair damages caused to adjacent facilities by demolition work

SECTION 02070  
SELECTIVE DEMOLITION

- F. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, or other occupied or used facilities.
  - 1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- G. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
- H. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
  - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

- A. General:
  - 1. Cease operations and notify the Engineer immediately if safety of the structure appears to be endangered. Take precautions to support structure until determination is made as to continuing operations.
  - 2. Locate, identify, stub off, and disconnect utility services that are to be removed.

3.2 DEMOLITION

- A. General: Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on the Contract Drawings in accordance with governing regulations.

3.3 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from the building site, all debris, rubbish, and other materials resulting from demolition operations, on a daily basis. Transport and legally dispose off site.
  - 1. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
  - 2. Burning of removed materials is not permitted on the project site.

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3.4 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean. Return elements of construction and surfaces to remain too a condition existing prior to the start of operations. Repair adjacent construction or surfaces soiled or damaged by the selective demolition work.

END OF SECTION 02070

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all materials, labor, equipment and services necessary to furnish, deliver and install rough carpentry and related work herein specified generally as follows:
  - 1. Wood blocking and curbing.
  - 2. Wood Sheathing

1.2 PRODUCT STORAGE

- A. Store lumber a minimum of 6" off the ground/roof in a dry, well-ventilated place, protected from the weather. Lumber material sections directly exposed to moisture shall not be acceptable for use with work and shall be subject to approval by the Engineer.

1.3 SUBMITTALS

- A. Submit manufacturers technical literature of proposed lumber and associated fasteners, for review and approval.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Lumber:
  - 1. Wood Blocking: Shall be No. 2 or better yellow pine, pressure treated by salt preservatives (Wolman or Osmose Process). Pressure treated wood shall conform to the requirements of AWWPA (American Wood Preserves Association) Standard C2 (above ground).
  - 2. Wood Sheathing: Shall be 5/8" Exterior plywood sheathing, suitable for exposure to wetting and drying. Sheathing shall conform to existing codes and standards.
- B. Fasteners used in conjunction with rough carpentry work shall be corrosion and rust resistant nails, expansion anchors, toggle-bolts, and/or screws and shall be staggered in application as detailed on the Contract Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide blocking as required to support other work solidly as indicated on the

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SECTION 06100  
ROUGH CARPENTRY

Contract Drawings or as required by the roofing manufacturer.

- B. Install the work straight in line and true in plane unless otherwise indicated. Remove any existing surface irregularities. Provide wood shims if necessary to maintain work level/plumb.
- C. Provide fasteners of adequate size and of sufficient numbers to securely anchor the materials in place as generally detailed on the Contract Drawings.
- D. The wood blocking thickness at perimeter metal edge flashings; i.e., gravel stop, (where indicated on the Contract Drawings) shall be minimum 4" higher than the top surface of the insulation. Install plywood blocking if necessary to maintain blocking height as indicated. Contractor shall field verify.
- E. Fasteners used to anchor wood blocking and continuous hook strip to wood substrates shall have a minimum fastener head diameter of (3/8) inch and a minimum embedment of (1-1/4) inches.

END OF SECTION 06100

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PART 1 - GENERAL

1.1 DESCRIPTION

- A. In general, work involves but not limited to the removal of existing asphalt roof shingles, felt underlayment, drip edges and flashings. Flat roof membrane, insulation and any built up roofing down to existing sheathing. See contract documents for further requirements.
- B. Work also includes the disposal of removed materials and protection of all roofing over which traffic from these operations will move as generally specified herein.

1.2 PROTECTION

- A. Provide barriers, fences, chutes, and the like to protect pedestrians, building personnel, the existing structure, site, and vehicles while performing work. Provide ample notification prior to any protective devices being installed.

1.3 ASBESTOS REMOVAL

- A. Owner to provide Contractor with asbestos report and/or asbestos abatement requirements.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 REMOVALS

- A. Prior to the commencement of any work, the location of trash chutes and receptacles shall be coordinated with the Owner.
- B. Materials resulting from this work must be removed from the roofs. No stacking will be permitted.
- C. Additional Requirements:
  - 1. Debris receptacle locations shall be where so directed and must be coordinated with the Owner.
  - 2. Receptacles are to be removed from the site as soon as they are filled and the contents disposed of off the premises.
  - 3. All dust and debris resulting from these operations that might have fallen or been blown onto buildings, roofs, equipment and the grounds must be thoroughly cleaned up at the end of each day's work.

SECTION 07100  
REMOVAL OF EXISTING ROOFING

4. Any damage to the building structure and/or site caused from removal of debris, shall be restored to its original condition at the Contractor's expense.
5. The Contractor shall undertake all necessary precautions to minimize disturbance of existing electrical conduit, cables, wire, etc., which are at present routed directly over the roof surface in various building sections. Temporarily disconnect these items as necessary to successfully complete the work. Restore to previous operational condition when work is complete. Any damage incurred to these items as a result of this work shall be repaired/replaced at the Contractors own expense. Refer to drawings for any electrical components indicated for removal or relocation.

END OF SECTION 07100

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PART 1 - GENERAL

1.1 GENERAL NOTES

- A. All terms and conditions specified in Part 1.01 General Notes of 07530 EPDM Roofing apply.

1.2 WORK INCLUDED

- A. Work under this section covers the installation of a new FULLY ADHERED EPDM ROOFING SYSTEM . Contractor shall include all related items of work as noted herein or indicated on the drawings or otherwise required to complete the specified elements or work
  - 1. Remove Existing roof membrane, flashings, and roof insulation; then prepare surface to receive new materials.
  - 2. Manufacturer of insulation shall be same as roofing membrane.

1.3 RELATED SECTIONS

- A. Section 07530 Fully Adhered Standard Adhesive EPDM Roofing System.

1.4 DEFINITIONS

- A. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.
- B. American Society for Testing and Materials ( ASTM ):
- C. EVT: Bitumen temperature at 75 centipoise for mechanical applicator and at 125 centipoise for hand mopping.

1.5 SUBMITTALS

- A. Product Data:
  - 1. Submit copies of Technical Information Sheets (TIS) for roof insulation and insulation fasteners.
- B. Samples:
  - 1. Submit samples of roof insulation and insulation fasteners.
- C. Drawings:
  - 1. Submit manufacturers shop drawing for insulation.
    - a. Shop drawings shall show complete layout of the insulation system and shall comply with the drainage patterns required. Only the manufacturer's insulation shop drawings will be acceptable.

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- D. Submit mechanical fastener product data, required spacing, and installation instructions for the specified wind uplift standards.

#### 1.6 QUALIFICATIONS

- A. As outlined in Section 07530 Fully Adhered EPDM Roofing System.

#### 1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable code for roof assembly fire hazard requirements.
- B. Underwriters Laboratories, Inc. (UL): Class A Fire Hazard Classification.
- C. Factory Mutual Engineering Corporation (FM): Roof Assembly Classification, in accordance with FM Construction Bulletin 1-28, meeting minimum requirements of FM 1-90.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products according to general requirements for materials and equipment and Part 3 of this Section.
- B. Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.
- C. Store roof insulation in weather protected environment; keep dry during application. Outdoors, keep clear of ground and moisture.

#### 1.9 ENVIRONMENTAL REQUIREMENTS

- A. Install roof insulation only when surfaces are dry and free of snow or ice.
- B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

#### 1.10 WARRANTY

- A. As outlined in Section 07530 Fully Adhered Standard Adhesive EPDM Roofing System.

### PART 2 - PRODUCTS

#### 2.1 NAILERS FOR ROOF INSULATION (AND OVERLAYMENT)

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SECTION 07220  
ROOF INSULATION

- A. Description: Structural Grade No. 2 or better Southern Pine, Douglas Fir, or Exterior Grade plywood. All wood shall be pressure treated for rot resistance.
  - 1. Nailer width: Minimum 3 1/2 in. (nominal) wide or as wide as the nailing flange of each roof accessory.
  - 2. Nailer thickness: Thickness of roof insulation.
- B. Reference Standards:
  - 1. Southern Pines: PS 20; SPIB Grading Rules.
  - 2. Western Woods: PS 20; WWPA Grading Rules.
  - 3. Plywood: PS 1; APA Grade Stamps.
  - 4. Pressure preservative treatment: AWPB LP2.

## 2.2 POLYISOCYANURATE ROOF INSULATION

- A. Description: Roof insulation consisting of closed cell polyisocyanurate foam core and a perforated black glass reinforced mat laminated to the face.
  - 1. Thickness: Tapered as indicated.
  - 2. Nominal Size: 48 in x 96 in
- B. Reference Standards:
  - 1. FS HH-I-1972/Gen.
  - 2. FS HH-I-1973/3.
  - 3. ASTM C 209 - Water Absorption.
  - 4. ASTM E 96 - Water Vapor Transmission of Materials.
  - 5. ASTM D 1621 - Compressive Strength.
  - 6. ASTM D 1622 - Density.
  - 7. ASTM D 2126 - Dimensional Stability.
  - 8. ASTM E 84 - Flame Spread

## 2.3 POLYISOCYANURATE ROOF INSULATION FASTENERS

- A. Description: Heavy duty threaded fastener with 3-coat waterborne fluorocarbon polymer coating and drill point tip capable of penetrating 20-gauge steel. Fastener shall meet minimum thread size of .260" and 13 threads per inch. Length shall be sufficient to penetrate deck a minimum of 3/4" for steel and 1" for wood and concrete. Structural concrete decks must be pre-drilled with a 7/32" carbide drill bit to a depth 1/2" deeper than the fastener engagement.

## 2.4 POLISOCYANURATE ROOF INSULATION ADHESIVE

- A. Description: Two-component low-rise polyurethane adhesive designed for anchoring acceptable roof insulation to specific deck types where allowed. Part "A" is the Isocyanate pre-polymer side; Part "B" is the polyol side.

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PART- 3 EXECUTION

3.1 PREPARATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Examine roof deck to determine that it is sufficiently rigid to support roofers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.
- C. Examine roof deck to determine that surface is in a suitable condition for roofing work. Do not start roof application until defects have been corrected.
- D. Examine roof deck to verify it is properly sloped to drains.
- E. Deck dryness test for structural concrete decks:
  - 1. Use approximately 1 pint of bitumen specified for use in roof membrane, heated to a temperature that will ensure an application temperature of 400°F.
  - 2. Pour bitumen on surface of deck. If bitumen foams, deck is NOT dry enough to roof.
  - 3. After bitumen has cooled, make an attempt to strip bitumen from deck surface. If bitumen strips clean from deck, deck is NOT dry enough to roof.
  - 4. Retest until bitumen ceases to foam and bitumen adheres firmly to deck.
- F. The condition of surface to receive roof insulation shall be firm, clean, smooth, and dry.

3.2 PROTECTION OF OTHER WORK

- A. Protect metal, glass, plastic, and painted surfaces within wind-borne range of bitumen application. Protect neighboring work, properties, cars, and persons from spills and wind-borne bitumen.

3.3 NAILERS

- A. Provide wood nailers. Mechanically attach nailers securely to structure to resist loads imparted from roof insulation, roof membrane, roof accessories, and other roof components.

3.4 STORAGE OF MATERIALS

- A. Keep materials used in construction of roofing systems dry before and during application. Store roll goods on end. Use breather type coverings such as canvas.

3.5 ROOF INSULATION APPLICATION: GENERAL

- A. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- B. Seal deck joints, where needed, to prevent bitumen drippage.
- C. Lay roof insulation in courses parallel to roof edges.
- D. Neatly fit insulation to all penetrations, projections, and nailers. Insulation shall be fit tightly, with gaps not greater than 1/4". All gaps greater than 1/4" shall be filled with acceptable insulation. Under no circumstances shall the roofing membrane be left unsupported over a space greater than 1/4". Cricket insulation shall be installed around roof drains so as to provide proper slope for drainage. Miter roof insulation edges at ridge, valley and other similar non-planar conditions.
- E. When installing multiple layers of insulation, all joints between layers shall be staggered at least 6 in.

3.6 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed as required.
- B. Correct identified defects or irregularities.

3.7 PROTECTION

- A. Protect building surfaces against damage from roofing work.
- B. Where traffic must continue over finished roof membrane, protect surfaces.

3.8 CLEAN UP

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this Section, consult manufacturer of surfaces for cleaning advice and conform to their instructions.

SECTION 07220  
ROOF INSULATION

- C. Remove excess materials, trash, debris, equipment, and parts from the Work.
- D. Repair or replace defaced or disfigured finishes caused by roofing work.

END OF SECTION - 07220

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PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Granule surfaced asphalt shingle roofing.
- B. Moisture shedding underlayment, eaves, valley and ridge protection.
- C. Associated metal flashing.

1.2 RELATED SECTIONS

- A. Section 06100 – Rough Carpentry.
- B. Section 07600 – Flashing and Sheet Metal.

1.3 REFERENCES

- A. ASTM A 653/A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron-Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM B 209 – Standard Specification for Aluminum, and Aluminum-Alloy Sheet and Plate.
- C. ASTM B 370 – Standard Specification for Copper Sheet and Strip for Building Construction.
- D. ASTM D 225 – Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules.
- E. ASTM D 226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- F. ASTM D 1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials used as Steep Roofing Underlayment for Ice Dam Protection.
- G. ASTM D 3018 - Standard Specification for Class A Shingles Surfaced with Mineral Granules.
- H. ASTM D 3161 – Standard Test Method for Wind Resistance of Asphalt Shingles (Fan-Induced Method).
- I. ASTM D 3462 - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.

SECTION 07311  
ASPHALT SHINGLES ROOFING SYSTEM

- J. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- K. ASTM D-4869 - Standard Specification for Asphalt-Saturated Organic Felt Shingle Underlayment Used in Roofing.
- L. ASTM D 6757 - Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products.
- M. ASTM E 108 – Standard Test Methods for Fire Test for Roof Coverings.
- N. ASTM G 21 – Determining Resistance of Synthetic Polymers to Fungi.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide manufacturer's printed product information indicating material characteristics, performance criteria and product limitations.
- C. Manufacturer's Installation Instructions: Provide published instructions that indicate preparation required and installation procedures.
- D. Certificate of Compliance: Provide Certificate of Compliance from an independent laboratory indicating that the asphalt fiberglass shingles made in normal production meet or exceed the requirements of the following:
  - 1. ASTM E 108/UL 790 Class A Fire Resistance
  - 2. ASTM D 3161/UL 997 Wind Resistance.
  - 3. ASTM D 3462
- E. Shop Drawings: Indicate specially configured metal flashing, jointing methods and locations, fastening methods and locations and installation details as required by project conditions indicated.

1.5 QUALITY ASSURANCE

- A. Installer Minimum Qualifications: Installer shall be licensed or otherwise authorized by all federal, state and local authorities to install all products specified in this section. Installer shall perform work in accordance with NCRA Roofing and Waterproofing Manual. Work shall be acceptable to the synthetic slate roof tile manufacturer.
- B. Mock Up: Provide a mock-up evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Engineer.

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ASPHALT SHINGLES ROOFING SYSTEM

2. Do not proceed with remaining work until workmanship, color and pattern are approved by Engineer.
  3. Remove Mock-Up area as required to produce acceptable work.
- C. Maintain one copy of manufacturers application instructions on the project site.
- D. Verify that manufacturer's label contains references to specified ASTM standards.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials and materials used with solvent based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Deliver shingles to site in manufacturer's unopened labeled bundles. Promptly verify quantities and conditions. Immediately remove damaged products from site.

1.7 PROJECT CONDITIONS

- A. Anticipate and observe environmental conditions (temperature, humidity and moisture) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions manufacturer's absolute limits.
- B. Provide 500 square feet of extra shingles of each color specified.
- C. Take special care when applying Waterproofing Shingle Underlayment and shingles when ambient or wind chill temperature is below 45 degrees F (7 degrees C). Tack Underlayment in place if it does not adhere immediately to the deck.

1.8 WARRANTY

- A. Manufacturer's Warranty: Furnish shingle manufacturer's warranty for the product listed below:
1. Lifetime Limited Warranty
- B. Warranty Supplement: Provide manufacturer's supplemental warranty to cover labor and materials in the event of a material defect for the following period after completion of application of shingles:
1. First Ten Years
- C. Warranty Transferability Clause: Make available to Owner shingle manufacturer's standard option for transferring warranty to a new owner.

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ASPHALT SHINGLES ROOFING SYSTEM

- D. Wind Warranty of 110 mph with grade to 130 mph for first 15 years provided all manufacturer's conditions and instructions are met by contractor.
- E. Refer to manufacturer's warranty for adjustments for commercial applications.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. CertainTeed Corporation.
- B. GAF
- C. Owens Corning
- D. Substitutions: Engineer Approved Equal.

2.2 ASPHALT FIBERGLASS SHINGLES

- A. CertainTeed Landmark Pro: Conforming to ASTM D 3018 Type I – Self-Sealing; UL Certification of ASTM D 3462, ASTM D 3161/UL997 80-mph Wind Resistance and UL Class A Fire Resistance; glass fiber mat base; ceramically colored algae resistance granules across entire face of the shingle; two-piece laminated shingle.
- B. Weight: (250 pounds) per square (100 square feet) (14.6 kg/sq m).
- C. Color: Selected by Owner.

2.3 SHEET MATERIALS

- A. Eaves Protection: CertainTeed "WinterGuard"; ASTM D1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement and "split" back plastic release film; provide material warranty equal in duration to that of shingles being applied.
  - 1. CertainTeed WinterGuard Granular.
  - 2. Engineer Approved Equal.
- B. Underlayment: ASTM D 4869, Asphalt saturated felt.

2.4 FLASHING MATERIALS

- A. Sheet Flashing: ASTM B 209; 0.025(0.63mm) thick aluminum, finish.
- B. Bituminous Paint: Acid and alkali resistant type; color by Owner.
- C. Tinner's Paint: Color as selected by Owner.

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2.5 ACCESSORIES

- A. Nails: Standard round wire type roofing nails, corrosion resistant; hot dipped zinc coated steel, aluminum or chormated steel; minimum 3.8 inch (9.5mm) head diameter; minimum 11 or 12 gage (2.5mm) shank diameter; shank to be sufficient length penetrate through the roof sheathing or ¾ inch (19mm) into solid wood, plywood or non-veneer wood decking.
- B. Asphalt Roofing Cement: ASTM D 4586, Type I or II.

2.6 FLASHING FABRICATION

- A. Form flashing to profiles indicated on Drawings and to protect roofing materials from physical damage and shed water.
- B. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions under provisions of Section 01051.
- B. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surfaces.
- C. Verify deck surfaces are dry and free of ridges, warps or voids.

3.2 ROOF DECK PREPARATION

- A. Follow shingle manufacturer's recommendations for acceptable roof deck material.
- B. Broom clean deck surfaces under eave protection and underlayment prior to their application.

3.3 INSTALLATION – EAVE ICE DAM PROTECTION

- A. Place eave edge and gable metal edge flashing tight with fascia boards. Weather-lap joints 2 inches (50mm). Secure flange with nails spaced 8 inches (200 mm) on center.
- B. Apply CertainTeed "WinterGuard" Waterproofing or approved equal Shingle Underlayment as eave protection in accordance with manufacturer's instructions.

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- C. Extend eave protection membrane minimum 24 inches (640 mm) up slope beyond interior face or exterior wall.

3.4 INSTALLATION – PROTECTIVE UNDERLAYMENT

- A. Install one layer of asphalt felt shingle underlayment perpendicular to slope of roof and lap minimum 4 inches (100 mm) over eave protection.
- B. Weather-lap and seal watertight with asphalt roofing cement items projecting through or mounted on roof. Avoid contact or solvent-based cements with WinterGuard or approved equal.

3.5 INSTALLATION – VALLEY PROTECTION

- A. For “closed-cut”, “woven” and “open” valleys, first place on ply of WinterGuard or approved equal, minimum 36 inches (910 mm) wide, centered over valleys. Lap joints minimum of 6 inches (152 mm) Follow instructions of shingle and waterproofing membrane manufacturer.

3.6 INSTALLATION – METAL FLASHING

- A. Weather-lap joints minimum 2 inches (50 mm).
- B. Seal work projecting through or mounted on roof with asphalt roofing and make weather tight.

3.7 INSTALLATION – ASPHALT SHINGLES

- A. Install shingles in accordance with manufacturer’s instructions for product type and application specified.

3.8 FIELD QUALITY CONTROL

- A. Field inspection will be performed by Owner and Engineer
- B. Visual inspection of the work will be provided by Owner. If conditions are unacceptable, Owner will notify the Engineer.

3.9 PROTECTION OF FINISHED WORK

- A. Protect finished work under provisions of Section 01051.
- B. Do not permit traffic over finished roof surface.

END OF SECTION 07311

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PART 1 - GENERAL

1.01 GENERAL NOTES

Preceding job start up, contractor shall decide to his satisfaction that all specifications contained herein are workable.

Contractor will perform all work by competent, trained, and properly equipped personnel in strict accordance with good roofing practices and applicable industry standards.

Contractor will observe all published safety prevention policies and practices relating to application of roofing system and related work. All federal, state, and local codes shall be followed.

Contractor will follow application, safety, and etc. information as published in the most current edition of the Firestone RubberGard EPDM Roofing System Technical Specifications or those of engineer approved equal.

Design base components shall be Firestone products, or Engineer approved equal.

1.02 WORK INCLUDED

- A. Work under this section covers the installation of a new FULLY ADHERED EPDM ROOFING SYSTEM at Trumbull Library located at 33 Quality St, Trumbull, CT 06611. In addition, contractor shall include all related items of work as noted herein or indicated on the drawings or otherwise required to complete the specified elements of work and provide the necessary warranties for this work.
- B. Contractor will dispose of all materials properly.

1.03 SECTION INCLUDES

- A. Substrate preparation.
- B. Wood nailer installation.
- C. Membrane installation
- D. Membrane flashing installation.
- E. Roof Insulation.

1.04 DEFINITIONS

- A. Roofing Terminology: Refer to ASTM D1079 for definition of terms related to roofing work not otherwise defined in the section.
- B. Firestone: Firestone Building Products Co., Headquarters, 525 Congressional Blvd., Carmel, IN 46032-5607
- C. American Society for Testing and Materials (ASTM): 1916 Race St., Philadelphia, PA 19103

1.05 SYSTEM DESCRIPTION

Roof Replacement at  
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## FULLY ADHERED STANDARD ADHESIVE EPDM ROOFING SYSTEM

## A. System Assembly:

Construction: Complete tear-off down to steel deck

Insulation Type and Installation: 1.5" minimum Firestone 1/4" Tapered ISO 95+ GL – mechanically fastened with Firestone Heavy Duty Fasteners to steel roof deck

Membrane Type and Installation: Firestone .060 LSFR – Fully Adhered

## 1.06 SUBMITTALS

## A. Product Data:

1. Submit copies of Manufacturer's Technical Information Sheets (TIS) for primary products used including roof membrane, splice tape, fasteners, and batten strip.

## B. Samples:

1. Submit samples of roof membrane, fasteners, and walkway pads

## C. Application Information:

1. Submit copy of Manufacturer's application specification.
1. Submit copy of job related Manufacturer's details including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, drains, and any other relevant details

## D. Warranty: Submit warranty sample.

## E. Pre Installation Notice:

1. Submit copy of Firestone Pre Installation Notice (PIN) that has been accepted and approved by Firestone. Or mfg approved copy of engineer approved equal manufacturer.

## F. Drawings:

1. Submit manufacturers shop drawing for tapered insulation.
  - a. Shop drawings shall show complete layout of the tapered system and shall comply with the drainage patterns required. Only the manufacturer's tapered insulation shop drawings will be acceptable.
    1. The responsibility of providing shop drawings for this project lies solely with the manufacturer of the tapered insulation system. Shop drawings by others will not be acceptable.
    2. Shop drawings shall include: Outline of roof, location of drains, scuppers or gutters, profile of tapered insulation components, indications of minimum and maximum insulation thicknesses, and the average "R" value for the completed insulation system.
    3. The roofing contractor shall verify all roof dimensions and drain locations and confirm same with the manufacturer.
    4. Approved shop drawings shall be returned to the manufacturer before insulation is delivered to the jobsite.

## 1.07 QUALITY ASSURANCE

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- A. Manufacturer:
  - 1. Company specializing in manufacturing the roofing membrane specified in this Section with ten years of manufacturing experience.
  - 2. System supplier must have ISO 9002 certification.
  - 3. Manufacturer must be able to provide the project with the membrane and Isocyanurate insulation that is produced in their facilities.
- B. Applicator:
  - 1. Shall be approved, licensed, or authorized applicator of the manufacturer.

1.08 REGULATORY REQUIREMENTS

- A. Conform to applicable local building code requirements.

1.09 QUALITY INSPECTION/OBSERVATION

- A. Inspection by Manufacturer: Provide a final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer.
  - 1. Technical representative shall not perform any sales functions.
  - 2. Contractor shall complete any necessary repairs required for issuance of warranty.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in manufacturer's original containers dry, undamaged, seals and labels intact and legible.
- B. Store all materials clear of ground and moisture with weather protective covering.
- C. Keep all combustible materials away from ALL ignition sources.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice.
- B. Do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application. Consult Firestone Technical Specifications on cold weather application.

1.12 WARRANTY

- A. Type/Term:
  - 1. Provide 20, year Firestone Red Shield Roofing System Limited Warranty (Red Shield Warranty). Warranty shall include membrane, roof insulation and membrane accessories.

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## FULLY ADHERED STANDARD ADHESIVE EPDM ROOFING SYSTEM

2. Warranty does not cover the cost of removal, repair, or replacement of overburden that is installed over Firestone Roof System. Overburden Waiver must be signed by building owner before construction starts.
  3. Provide 20 year roofing system warranty of engineer approved manufacturer.
- B. Coverage
1. Red Shield Warranty:
    - a. Limit of liability: No Dollar Limitation
    - b. Scope of coverage  
Repair any leak in the Firestone EPDM Roofing System caused by the ordinary wear and tear of the elements, manufacturing defect in Firestone brand materials, and the workmanship used to install these materials.

PART 2 - PRODUCTS

## 2.01 NAILERS FOR FLANGES AND ROOF ACCESSORIES

- A. Description: Structural Grade No. 2 or better Southern Pine, Douglas Fir or Exterior Grade plywood. All wood shall be pressure treated for rot resistance.
1. Nailer width: Minimum 3-1/2 in. (nominal) wide or as wide as the nailing flange of each roof accessory.
  2. Nailer thickness: Thickness of roof insulation.
- B. Reference Standards:
1. Southern Pines: PS 20; SPIB Grading Rules.
  2. Western Woods: PS 20; WWPA Grading Rules
  3. Plywood: PS 1; APA Grade Stamps.
  4. Pressure preservative treatment: AWPB LP2.

## 2.02 MANUFACTURERS - MEMBRANE MATERIALS

- A. Firestone Adhered single-ply membrane system: .060 LSFR elastomeric sheet roofing that is adhered to acceptable substrate with manufacturers bonding adhesive.
- B. Engineer approved equal.

## 2.03 ELASTOMERIC SHEET ROOFING AND FLASHING MEMBRANE

- A. Description: Non-reinforced, cured, synthetic single-ply membrane composed of Ethylene Propylene Diene Terpolymer (EPDM) conforming to the following physical properties:

1. Membrane Type: .060 LSFR

Property:

Specification:

Specific Gravity

1.15 +/- 0.05

Tensile Strength, Minimum, psi ( Mpa )

1425 (9.8)

Elongation, Minimum, %

475

Tear Resistance, lbf / in (N / M)

210 ( 933)

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## FULLY ADHERED STANDARD ADHESIVE EPDM ROOFING SYSTEM

|                                                                                         |             |
|-----------------------------------------------------------------------------------------|-------------|
| Ozone Resistance, 166 hours @ 100 pphm @ 104°F<br>with 50% extension                    | No Cracks   |
| Heat Aging, 28 days @ 240°F                                                             |             |
| Tensile Strength, Minimum psi ( Mpa)                                                    | 1415 ( 9.8) |
| Elongation, Minimum %                                                                   | 310         |
| Brittleness Point, max., °F, °C                                                         | -49 ( -45)  |
| Water Absorption, change in weight after<br>immersion in water for 166 hours @ 158°F, % | < 2.0       |
| Tolerance On Nominal Thickness, %                                                       | +/- 10      |
| Water Vapor Permeability, Perm-Mils                                                     | 2.0         |

## B. Reference Standards:

1. ASTM D4637-96: Standard Specification for EPDM Sheet used in single-ply roof membrane
2. ASTM D297: Methods for Rubber Products, Chemical Analysis.
3. ASTM D412, Die C: Test Methods for Rubber Properties in Tension.
4. ASTM D471: Test Methods for Rubber Property, Effect of Liquids.
5. ASTM D573: Test Method for Rubber, Deterioration in an Air Oven.
6. ASTM D624, Die C: Test Method for rubber property-Tear Resistance
7. ASTM D746: Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
8. ASTM D751: (Grab Method) Method of Testing Coated Fabrics.
9. ASTM D816: (Modified) Methods of Testing Rubber Cements.
10. ASTM D1149: Test Method for Rubber Deterioration, Surface Ozone Cracking in a Chamber.
11. ASTM D2240: Test Method for Rubber Property - Durometer Hardness.
12. ASTM E96: Test Methods for Water Vapor Transmission of Materials.

## C. Product/Producer:

1. RubberGard® EPDM membrane by Firestone.

## 2.04 POLYISOCYANURATE ROOF INSULATION FASTENERS

## POLYISOCYANURATE ROOF INSULATION

A Description: Roof insulation consisting of closed cell polyisocyanurate foam core and a perforated black glass reinforced mat laminated to the face.

C. Product/Producer: ISO 95+ Polyisocyanurate Insulation by Firestone.

D. Engineer approved equal.

## POLYISOCYANURATE ROOF INSULATION FASTENERS

1. Description: Heavy duty threaded fastener with 3-coat waterborne fluorocarbon polymer coating and drill point tip capable of penetrating 20-gauge steel. Fastener shall meet minimum thread size of .260" and 13 threads per inch. Length shall be

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sufficient to penetrate deck a minimum of ¾" for steel and 1" for wood and concrete. Structural concrete decks must be pre-drilled with a 7/32" carbide drill bit to a depth ½" deeper than the fastener engagement.

2. Product/Producer:
  - Heavy Duty (HD) fasteners by Firestone.
  - Engineer approved equal.

## 2.05 ELASTOMERIC SHEET ROOFING SYSTEM COMPONENTS

- A. Roof Flashing (Gravel Stops):
  1. Description: Semi-cured 45 mil EPDM membrane laminated to 35 mil EPDM tape adhesive
  2. Product/Producer:
    - a. QuickSeam™ Flashing by Firestone.
    - b. Engineer approved equal.
- B. Elastomeric Uncured Flashing:
  1. Description: Non-reinforced, self curing, synthetic, single-ply flashing composed of Ethylene Propylene Diene Terpolymer (EPDM) conforming to the following physical properties as indicated by ASTM D4811-90 standard specification for Non-vulcanized rubber sheet used as roof flashing.
    - a. Nominal Thickness: .060 inch

| Property:                                     | Specification: |
|-----------------------------------------------|----------------|
| Thickness                                     | 0.055          |
| Green Strength Modulus 100% @ 75°F(psi)       | 25-250         |
| Elongation, (Ultimate), %                     | 400            |
| modulus 100% @ 122°F(psi)                     | 12             |
| Elongation (Ultimate) %                       | 200            |
| Shelf Stability: Modulus 100% at 75°F(psi)    | 250            |
| Elongation, min, %                            | 400            |
| Vulcanizability: Tensile strength, min, (psi) | 406            |
| Elongation, min, %                            | 400            |
| Tensile Set: min, %                           | 80             |
| Dimensional Stability, max, %                 | +/- 10         |
| Weatherability , no cracks or crazing         | pass           |
| Water Vapor Permeability, Perm-Mils           | 2.0            |

## Reference Standards:

1. ASTM D412:Test Methods for Rubber Properties in Tension
2. ASTM D471:Test Methods for Rubber Property-Effect of liquids
3. ASTM D573:Test Methods for Rubber-Deterioration in Air oven
4. ASTM D624:Test Methods for Rubber Property-Tear Resistance
5. ASTM D1149:Test Method for Rubber Deterioration-Surface Ozone Cracking in a chamber

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6. ASTM D1204: Test Method for Linear Dimensional Changes on a Non-rigid Thermoplastic Sheeting or Film at Elevated Temperatures
  7. ASTM D2137: Test Methods for Rubber Property-Brittleness Point of Flexible Polymers and Coated Fabrics
2. Product/Producer:
    - a. EPDM FormFlash™ flashing membrane by Firestone.
    - b. Engineer approved equal.
- C. Lap Splice Tape:
1. Description: 35 mil EPDM-based, formulated for compatibility with EPDM membrane and high-solids primer.
  2. Product/Producer:
    - a. QuickSeam™ Splice Tape by Firestone.
    - b. Engineer approved equal.
- D. Adhesive Primer:
1. Description: High-solids, butyl based primer formulated for compatibility with EPDM membrane & tape adhesive.
  2. Product/Producer:
    - a. QuickPrime™ by Firestone.
    - b. Engineer approved equal.
- E. Batten Covers:
1. Description: Cured 60 mil EPDM membrane laminated to 35 mil EPDM tape adhesive.
  2. Product/Producer:
    - a. QuickSeam™ Batten Cover by Firestone.
    - b. Engineer approved equal.
- F. Splice Adhesive:
1. Description: Butyl-based, formulated for compatibility with EPDM membrane.
  2. Product/Producer:
    - a. RubberGard® Splice Adhesive by Firestone.
    - b. Engineer approved equal.
- G. Bonding Adhesive:
1. Description: Neoprene-based, formulated for compatibility with EPDM membrane & a wide variety of substrate materials, including masonry, wood, and insulation facings.
  2. Product/Producer:
    - a. RubberGard® Bonding Adhesive by Firestone.
    - b. Engineer approved equal.
- H. Pourable Sealer:
1. Description: 2-Part urethane, 2-color for reliable mixing.
- I. Seam Plates, Batten Strips and Insulation Plates:
1. Description: Steel with a Galvalume® coating.
  2. Reference Standard: Corrosion-resistant to meet FM-4470 criteria.
- J. Termination Bar:
1. Description: 1.3" X 0.10" thick aluminum bar with integral caulk ledge.
  2. Product/Producer:

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- a. Termination Bar by Firestone.
- b. Engineer approved equal.
- K. Roof Walkway Pads:
  - 1. Description: EPDM Walkway Pads, 0.30" X 30" X 30" with EPDM tape adhesive strips laminated to the bottom.
  - 2. Product/Producer:
    - a. QuickSeam™ Walkway Pads by Firestone.
    - b. Engineer approved equal.

## 2.06 METAL FLASHING

- A. Edge Metal and/or Coping:
  - 1. Description: Provide manufactured .040 Aluminum with Kynar finish in manufacturer's standard colors to be selected by owner.

PART 3 - INSTALLATION

## 3.01 EXAMINATION

- A. Examine roof deck to determine that it is sufficiently rigid to support roofers and their mechanical equipment and that deflection will no strain or rupture roof components or deform deck.
- B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- C. Start work with sealants and adhesives at 60° - 80° F.
- D. Fumes from adhesive solvents may be drawn into the building during installation through rooftop intakes. Appropriate measures must be taken to assure that fumes from adhesive solvents are not drawn into the building through air intakes.
- E. For reroofing applications only: remove existing roof system components as specified.
- F. The surface must be clean, dry, smooth, free of sharp edges, fins, loose or foreign materials, oil, grease and other materials that may damage the membrane, all roughened surfaces, which could cause damage, shall be properly repaired before proceeding.
- G. All surface voids of the immediate substrate greater than 1/4" wide must be properly filled with an acceptable insulation or suitable fill material.

## 3.02 PROTECTION OF OTHER WORK

- A. Protect metal, glass, plastic, and painted surfaces from adhesives and sealants.
- B. Protect neighboring work, property, cars, and persons from spills and overspray from adhesives, sealants and coatings and from damage related to roofing work.
- C. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trade.

## 3.03 MATERIAL STORAGE AND HANDLING

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- A. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.
- B. Consult container labels and material Safety Data Sheets (MSDS) for specific safety instructions.
- C. Deliver materials to job site in their original containers as labeled by the manufacturer.

3.04 WOOD NAILER LOCATION AND INSTALLATION

- A. Total wood nailer height shall match the total thickness of insulation being used and shall be installed with a 1/8" gap between each length and at each change of direction.
- B. Wood nailers shall be firmly fastened to the deck. Mechanically fasten wood nailers to resist a force of 200 lbs. per linear foot.

3.05 ROOF INSULATION APPLICATION: GENERAL

- A. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- B. Seal deck joints, where needed, to prevent bitumen drippage.
- C. Lay roof insulation in courses parallel to roof edges.
- D. Neatly fit insulation to all penetrations, projections, and nailers. Insulation shall be fit tightly, with gaps not greater than 1/4". All gaps greater than 1/4" shall be filled with acceptable insulation. Under no circumstances shall the roofing membrane be left unsupported over a space greater than 1/4". Tapered insulation shall be installed around roof drains so as to provide proper slope for drainage. Miter roof insulation edges at ridge, valley and other similar non-planar conditions.
- E. When installing multiple layers of insulation, all joints between layers shall be staggered at least 6 in.

3.06 MEMBRANE PLACEMENT AND ATTACHMENT

- A. Beginning at the low point of the roof, place the Firestone RubberGard membrane without stretching over the acceptable substrate and allow to relax a minimum of 30 minutes before attachment or splicing.
- B. After making sure the sheet is placed in its final position, fold it back evenly onto itself so as to expose the underside.
- C. Sweep the mating surface of the membrane with a stiff broom to remove excess dusting agent (if any) or other contaminants from the mating surface.
- D. Apply Bonding Adhesive at about the same time to both the exposed underside of the sheet and the substrate to which it will be adhered so as to allow approximately the same drying time. Apply Bonding Adhesive so to provide an even and uniform film thickness. Do not apply bonding adhesive to areas that will be subsequently spliced.
- E. Allow Bonding Adhesive to flash off until tacky. Touch the Bonding Adhesive surface with a clean, dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, pushing straight down to check for stringing, also push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If

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## FULLY ADHERED STANDARD ADHESIVE EPDM ROOFING SYSTEM

either motion exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating.

- F. Starting at the fold, roll the previously coated portion of the sheet into the coated substrate slowly and evenly so as to minimize wrinkles.
- G. Compress the bonded half of the sheet to the substrate with a stiff push broom.
- H. Fold the unadhered half of the membrane sheet back onto itself, and repeat the bonding procedure to complete the bonding of the sheet.

## 3.07 MEMBRANE LAP SPLICING

## A. General:

1. Position the sheet at the splice area by overlapping membrane 5 inches. Once the membrane is in place, mark the bottom sheet 1/2" to 3/4" from the edge of the top sheet every 4 to 6 feet. Tack the sheet back with Firestone QuickPrime at 5' centers and at factory splices or as necessary to hold back the membrane at the splicing area.
2. Remove excess amounts of dusting agent on the sheet and at factory splices using a stiff push broom. Stir Firestone QuickPrime thoroughly before and during use. Dip the QuickScrubber into the bucket of QuickPrime, keeping the QuickScrubber flat. Apply the QuickPrime using long back and forth type strokes with pressure along the length of the splicing area until surfaces become a dark gray in color. Apply QuickPrime to both surfaces at the same time to allow the same flash off time. Change the scrub pad each 200 feet of 3 inch field splice, or when the pad will no longer hold the proper amount of QuickPrime. Additional scrubbing is required at areas that may have become contaminated or have excess amounts of dusting agent, and at all factory splices.
3. Position the QuickSeam Splice Tape on the bottom sheet, aligning the edge of the release paper with the markings. Immediately roll the splice tape with a 3"-4" wide silicone or silicone sleeved steel hand roller or a short nap 3" paint roller.
4. When the QuickSeam Splice Tape has been installed for the entire splice length allow the top sheet to rest on top of the tape's paper backing. Trim the top sheet as necessary to assure that 1/8"-1/2" of the QuickSeam Splice Tape will be exposed on the finished splice.
5. To remove the paper backing from the tape, first roll back the RubberGard membrane sheet, then peel the paper backing off the QuickSeam Splice Tape by pulling against the weight of the bottom sheet at approximately a 45 degree angle to the tape and parallel with the roof surface. Allow the top sheet to fall freely onto the exposed QuickSeam Splice Tape. Broom the entire length of the splice as the release paper is being removed.
6. Roll the splice using a 1-1/2"-2" wide silicone or silicone sleeved steel hand roller, first across the splice, and then along the entire length of the splice.

## 3.08 MEMBRANE SECUREMENT Standard Adhesives

## FULLY ADHERED STANDARD ADHESIVE EPDM ROOFING SYSTEM

- A. Secure membrane at all locations where the membrane terminates or goes through an angle change greater than 2" in 12" except for round pipe penetrations less than 18" in diameter and square penetrations less than 4" square.
- B. Mechanically fasten Reinforced Perimeter Fastening Strips per Firestone recommendations.

## 3.09 FLASHING - PENETRATIONS

- A. General:
  - 1. Flash all penetrations passing through the membrane.
  - 2. The flashing seal must be made directly to the penetration.
- B. Pipes, Round Supports, etc
  - 1. Flash with Firestone Pre-Molded EPDM Pipe Flashings where practical.
  - 2. Flash using FormFlash when Pre-Molded EPDM Pipe Flashing is not practical.
- C. Structural Steel Tubing:
  - 1. Use a field fabricated pipe flashing detail provided that the minimum corner radius is greater than 1/4" and the longest side of the tube does not exceed 12". When the tube exceeds 12" use a standard curb detail.
- D. Roof Drains:
  - 1. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl.
  - 2. Taper insulation around the drain to provide a smooth transition from the roof surface to the drain. Use pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope. Slope shall not exceed Firestone recommendations.
  - 3. Position the RubberGard membrane, then cut a hole for the roof drain to allow 1/2" -3/4" of membrane extending inside the clamping ring past the drain bolts.
  - 4. Make round holes in the RubberGard membrane to align with clamping bolts. Do not cut the membrane back to the bolt holes.
  - 5. Place Water Block Seal on top of drain bowl where the clamping ring seats below the membrane
  - 6. Install the roof drain clamping ring and clamping bolts. Tighten the clamping bolts to achieve constant compression.
- E. Pipe Clusters and Unusual Shaped Penetrations:
  - 1. Fabricate penetration pockets to allow a minimum clearance of 1" between the penetration and all sides.
  - 2. Secure penetration pockets per Manufacturer Details
  - 3. Fill penetration pockets with Pourable Sealer, so as to shed water. Pourable Sealer shall be a minimum of 2" deep.
- F. Hot Pipes:
  - 1. Protect the rubber components from direct contact with steam or heat sources when the in-service temperature is in excess of 180° F. In all such cases flash to an intermediate insulated "cool" sleeve per Manufacturer details.
- G. Flexible Penetrations:
  - 1. Provide a weathertight gooseneck set in Water Block Seal and secured to the deck.
  - 2. Flash in accordance with Manufacturer Details.

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## FULLY ADHERED STANDARD ADHESIVE EPDM ROOFING SYSTEM

- H. Scuppers:
  - 1. Set welded watertight scupper in Water Block Seal and secure to the structure.
  - 2. Flash in accordance with Manufacturer Details.
- I. Expansion Joints:
  - 1. Install as shown on roof drawings in accordance with Manufacturer details.

### 3.10 FLASHING - WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, SKYLIGHTS, ETC.

- A. General:
  - 1. Using the longest pieces practical, flash all walls, parapets, curbs, etc., a minimum of 8" high per Manufacturer Details.
- B. Evaluate Substrate:
  - 1. Evaluate the substrate and overlay per Manufacturer specifications as necessary.
- C. Complete the splice between flashing and the main roof sheet with Splice Adhesive before adhering flashing to the vertical surface. Provide lap splices in accordance with Manufacturer Details.
- D. Apply Bonding Adhesive at about the same time to both the flashing and the surface to which it is being bonded so as to allow approximately the same flash off time. Apply Bonding Adhesive in a uniform coating.
- E. Allow Bonding Adhesive to flash off until tacky. Touch the Bonding Adhesive surface with a clean, dry finger to be certain that the adhesive does not stick or string. While touching the adhesive, pushing straight down to check for stringing, also push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating. Flash off time will vary depending on ambient air conditions.
- F. Roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles.
- G. Ensure proper contact of flashing by brooming in place.
- H. Provide termination directly to the vertical substrate as shown on roof drawings.
- I. Install T-Joint covers at field and flashing splice intersections as required by Manufacturer.
- J. Install intermediate flashing attachment as required by Manufacturer Specifications and Details.

### 3.11 FLASHING - GRAVEL STOPS OR ROOF EDGE METALS

- A. Apply QuickPrime to the metal edging and membrane as described in Manufacturer Specifications.
- B. Place the roll of QuickSeam Flashing on the roof a few feet ahead of the application starting point, positioned so that it unrolls from the top of the roll. Remove approximately 2'-3' of release paper and apply to the metal flange and RubberGard membrane. Lap adjacent rolls of QuickSeam Flashing a minimum of one inch.
- C. With a 2"-3" wide silicone or silicone sleeved steel hand roller, roll the QuickSeam Flashing ensure proper adhesion. Additional attention must be given to factory splice intersections and to any change in plane.

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## FULLY ADHERED STANDARD ADHESIVE EPDM ROOFING SYSTEM

- D. Apply 6" length of QuickSeam Flashing, a QuickSeam Joint Cover, or 6"x6" FormFlash to the inside edge of the QuickSeam Flashing at all overlaps.
- E. Apply 6" length of QuickSeam Flashing, a QuickSeam Joint Cover, or 6"x6" FormFlash at all intersections between the QuickSeam Flashing and field fabricated splices.
- F. Where QuickSeam Flashing will not completely cover the metal flange, an additional piece of QuickSeam Flashing must be applied to the metal edge laps. Apply Seam Edge Treatment at the intersections of the flashing sections.
- G. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, an additional piece of QuickSeam Flashing shall be applied over the metal lap to the top of the gravel stop, after the initial application of QuickSeam Flashing. SeamEdge Treatment shall be applied at the intersections of the two flashing sections.
- H. When the roof slope is greater than 1 in 12, apply Seam Edge Treatment along the back edge of the QuickSeam Flashing.

## 3.12 TEMPORARY CLOSURE

- A. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.

## 3.13 SHEET METAL WORK

- A. Install Firestone sheet metal as shown on roof drawings.
- B. Follow current industry guidelines for installation or Manufacturer requirements, whichever is more stringent.

## 3.14 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed as required by the manufacturer
- B. Correct identified defects or irregularities.

## 3.15 CLEAN-UP

- A. Clean all contaminants from building and surrounding areas.
- B. Remove trash, debris, equipment from project site and surrounding areas.
- C. Repair or replace damaged building components or surrounding areas to the satisfaction of the building owner.

END OF SECTION 07530

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all labor, materials, equipment and services necessary to furnish, deliver and install all flashing, sheet metal and related work required by the Contract Drawings and/or herein specified, generally as follows:
  - 1. Aluminum Rake Trim
  - 2. Aluminum Closure Trim
  - 3. Aluminum Counter Flashing

1.2 SUBMITTALS

- A. The Contractor shall submit, for approval, color and "mock-up" samples of the work included herein. No work for which such samples are required shall proceed until they have been approved.

PART 2 - PRODUCTS

2.1 FLASHINGS

- A. Roofing flashings: including, edge flashing, counterflashing, drip edge flashing, and miscellaneous flashings shall be fabricated from aluminum or copper of the sizes and configurations detailed on the Contract Drawings.
- B. All metal flashings at rakes, closures, and counter flashings shall be fabricated from 0.040" thick aluminum of the configurations generally indicated on the Contract Drawings. Finish shall be baked on enamel. Color shall be selected by the Owner.
- C. Miscellaneous materials for use in conjunction with metal work shall be the most appropriate types consistent with the best current practices of the industry, and as recommended by the manufacturers of the materials furnished.

PART 3 - EXECUTION

3.1 REFERENCE STANDARDS

- A. All metal work, and all materials and workmanship in connection therewith, shall be furnished and performed in accordance with the best recommended practices.

3.2 METAL FLASHINGS (General Requirements)

- A. Metal work shall be fabricated and installed in accordance with details shown on Contract Drawings. Details shown on the Contract Drawings shall be considered typical and shall apply for all similar conditions or features where not otherwise shown. Where details are not shown and typical details do not apply, details of the work proposed shall be submitted for approval of the Engineer.

SECTION 07600  
FLASHING AND SHEET METAL

- B. Adequate provisions shall be made in all sheet metal work to compensate for thermal expansion and contraction.
- C. Where nailing is required, large head nails that are electrolytically compatible with the material being nailed shall be used.
- D. Wherever metal work comes in contact with dissimilar metals, insulation shall be provided between same consisting of a layer of 15 lb. saturated roofing felt bonded in mastic, or the surfaces in contact shall be given a coat of bituminous cement.
- E. Surfaces upon which metal work will be applied shall be made smooth, free from projections and depressions, and surface irregularities.
- F. Metal work shall be installed so that it is water-tight and free from visible waves, buckles, dents, tool marks, dirt, stain and other defects of materials and workmanship which would affect its strength, durability and appearance.
- G. Cutting, patching and fitting of metal work shall be neatly and carefully performed as required so as to leave such work complete and watertight.
- H. All metal work shall be securely fastened in place and formed so as to resist loosening by wind action and by thermal expansion and contraction. All loose edges of flashings, such as the exposed edge flashing, shall be hemmed.
- I. Upon completion, all metal work shall be thoroughly cleaned on exposed surfaces and left free from stain, discoloration, and other surface defects.
- J. Flashings shall be fabricated and installed as shown on the Contract Drawings and in accordance with the best recognized practices of the industry.

END OF SECTION 07600

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Allen White, Town of Trumbull  
5688 Main Street  
Trumbull, CT 06611  
[awhite@trumbull-ct.gov](mailto:awhite@trumbull-ct.gov)

5/19/2016

**ASBESTOS PRE-RENOVATION INSPECTION  
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CS# 190-612, 5/3/2016  
Page 1 of 4**

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| Introduction                  | 2              |
| Inspection Report Synopsis    | 3              |
| Limitations of the Inspection | 4              |
| Recommendations               | 4              |

**Attachments:**

- Scope of inspection drawing(s), 1 page(s)
- PLM Certificate of Analysis report with chain of custody, 7 page(s)
- Sample location drawing(s), 1 page(s)

**Report Distribution:**

[awhite@trumbull-ct.gov](mailto:awhite@trumbull-ct.gov)

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**INTRODUCTION**

**EXECUTIVE SUMMARY:** Asbestos containing materials (ACM) were not detected within the scope of this inspection.

**SITE DESCRIPTION/BACKGROUND:** We understand the following:

- The subject 27,675 sq ft library building was constructed in 1971 of masonry construction.
- The roof was replaced approximately 16 years ago and that the old roof had been tested by others and determined to be ACM.
- The town plans on replacing the existing roof with the exception of the lower roof with the stone covering.
- The roof may be accessed from an interior ladder.
- The town will be responsible for patching our roof cuts.

**SCOPE OF INSPECTION:** An Asbestos Pre-Renovation inspection, as directed by our client Allen White. We understand that the scope of our sampling is limited to the upper roofs only.

Our work included the following:

- Collection and analysis of suspect exterior roofing components, as required by the regulations prior to renovation.
- A list with quantity, type and location of ACM in the scope (if any).
- Report of the findings.

This investigation and information provided in this report depends partly on background information provided by the client. This report is intended for the use of the client. The scope of services performed may not be appropriate for other users and any use of this report by third parties is at their sole risk. This report is intended to be used in its entirety. No excerpts may be taken to be representative of this report.

**TEST PARAMETERS:** This is an Asbestos Renovation Inspection which is needed for compliance with EPA NESHAP Regulations for Building Renovations and Demolition, 40 CFR PART 61, OSHA 1926.1101 and CT DPH 19a-332a-1 through 16.

For building material sampling, EPA Wet Methods were used to prevent fiber release. Building materials sampled are analyzed at our laboratory by EPA method 600/R-93/116. This is currently the approved EPA Test method, which uses Polarized Light Microscopy with Dispersion Staining. The laboratory is accredited by NIST/NVLAP and AIHA Lab Accreditation Program, LLC, and is a Connecticut Approved Environmental Laboratory for Asbestos Analysis.

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**Page 3 of 4**

**INSPECTION REPORT SYNOPSIS**

**LOCATION NAME AND ADDRESS:** Trumbull Library  
33 Quality Street, Trumbull, CT  
Exterior Selected Roofs

**INSPECTION DATE(S):** 5/3/2016.

**QUALIFICATIONS:**

The Inspection was conducted by Daniel P. Sullivan:

- EPA & State of Connecticut Accredited Asbestos Inspector, Project Monitor & Project Designer
- State of Connecticut Licensed Asbestos Inspector/Management Planner (#000019)
- State of Connecticut Licensed Asbestos Project Monitor (#000036)
- State of Connecticut Licensed Asbestos Project Designer (#000096)

For information about Chem Scope, Inc., log onto <http://www.chem-scope.com>.

**FINDINGS:** No Asbestos Containing Materials were detected within the scope of this inspection.

**The following is a summary table of the materials that tested as non-Asbestos Containing Material (ACM) (<1%) within the Scope of Work:**

| <b>Material/ Location</b>                                                                                                                                                                                                                                                                                          | <b>Samples</b>  | <b>Findings</b>      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------|
| Black pliable fibrous rolled on roof shingles with black hard tar at seams on black tar and paper decking (1/2" thick on 1/2" tan fibrous insulation on 2" of yellow foam insulation with black paper backing on black/gray paper on brown paper with black tar on corrugated metal decking) / Roofs R1, R2 and R3 | 190-612-(1-15)  | No Asbestos Detected |
| Black fibrous shingle with black fibrous roofing tar and paper (at perimeters, penetrations and roof joints)/ All Roofs in Scope                                                                                                                                                                                   | 190-612-(16-18) | No Asbestos Detected |
| Black fibrous shingle with white and gray granules on black tarpaper (on wood) / Pitched Roofs from R1 and R3 up to R2)                                                                                                                                                                                            | 190-612-(19-22) | No Asbestos Detected |

**NOTE:** Suspect ACM materials exist inside and outside of the building that are not mentioned in this report because they are either not in the scope of this inspection or were inaccessible at the time of the inspection.



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**LIMITATIONS OF THE INSPECTION**

It is important to note that every effort is made to detect asbestos (ACM) in the path of the renovation by our inspectors. It is not practical or prudent to demolish the entire roof system during an inspection. The owner should be aware of this in case suspect materials or concealed suspect materials are uncovered during the actual renovation. Interior materials such as insulated roof drain lines and insulated roof drain basins were not inspected.

If suspect materials that were previously not accessible or not sampled during this inspection are discovered during the renovation, or if the scope of the renovation changes to include disturbance of new materials not inspected, then renovation must stop and the materials must be sampled by a CT DPH licensed asbestos inspector prior to disturbance of these materials.

**RECOMMENDATIONS**

Although no asbestos was detected within the scope of this inspection it is important to understand that Asbestos removal is regulated by federal and state agencies.

OSHA regulations 1926.1101 requires that before asbestos removal or repair work (class I, II or III work) is initiated, building owners/facility owners must notify their own employees and employers who are bidding on such work, of the quantity and location of ACM or PACM (presumed asbestos containing material) present in such areas. Also for inadvertently discovered ACM or PACM there is a 24-hour notification requirement to the owner and all employers at the site.

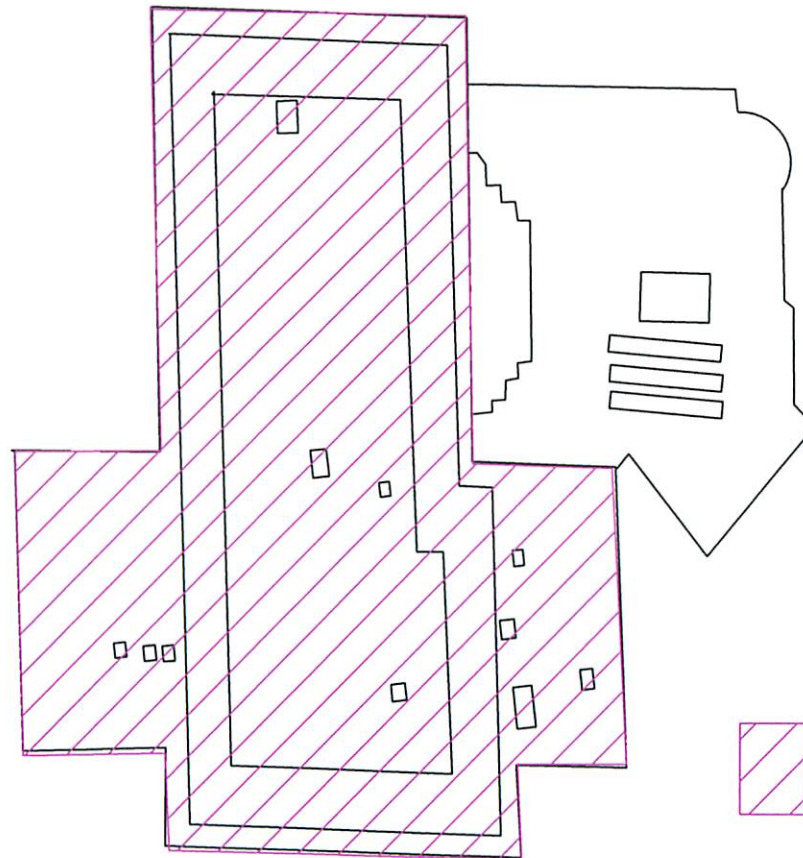
Sincerely,



Dan Sullivan  
President

**ChemScope Inc.**  
**Trumbull Library**  
**33 Quality Street, Trumbull, CT**  
**Roof Plan**  
**CS#190-612, 05/03/2016**

SCOPE OF WORK DRAWING



←————— Quality Street —————→



**LEGEND OF SYMBOLS**

SCOPE OF INSPECTION

**NOTATIONS**

DRAWN BY

**ChemScope Inc.**

SHEET TITLE

33 Quality Street  
 TRUMBULL, CT

CHEMSCOPE NUMBER:  
 CS# 190-612

SCALE:  
 NOT TO SCALE

DATE:  
 5/3/16

DRAWING NUMBER

**1 S**



## Certificate Of Analysis

*Town of Trumbull  
366 Church Hill Road  
Trumbull CT 06611*

05/16/2016  
CS#: 190-612  
Page 1 of 5

*Bulk sample(s) from Trumbull Library, 33 Quality Street, Trumbull, CT collected by Dan Sullivan on  
05/03/2016*

*Asbestos Identification in the samples. Examination made by Polarized Light Microscopy (PLM) per EPA Test Method  
600/R-93/116*

### Sample Identification

*190-612-1 Black pliable fibrous rolled on roof shingles with  
black hard tar at seams on black tar and paper decking (1/2"  
thick on 1/2" tan fibrous insulation on 2" of yellow foam  
insulation with black paper backing on black/gray paper on  
brown paper with black tar on corrugated metal  
decking)/Exterior, Roof R1*

*190-612-2 Black pliable fibrous rolled on roof shingles with  
black hard tar at seams on black tar and paper decking (1/2"  
thick on 1/2" tan fibrous insulation on 2" of yellow foam  
insulation with black paper backing on black/gray paper on  
brown paper with black tar on corrugated metal  
decking)/Exterior, Roof R2*

*190-612-3 Black pliable fibrous rolled on roof shingles with  
black hard tar at seams on black tar and paper decking (1/2"  
thick on 1/2" tan fibrous insulation on 2" of yellow foam  
insulation with black paper backing on black/gray paper on  
brown paper with black tar on corrugated metal  
decking)/Exterior, Roof R3*

*190-612-4 Tan fibrous insulation (from sample #1)/Exterior,  
Roof R1*

*190-612-5 Tan fibrous insulation (from sample #2)/Exterior,  
Roof R2*

### Findings (Analyzed 05/16/2016)

*No Asbestos Detected  
10% Non- Fibrous Particles  
78% Volatile on Ignition  
12% Fiberglass*

*No Asbestos Detected  
12% Non- Fibrous Particles  
74% Volatile on Ignition  
14% Fiberglass*

*No Asbestos Detected  
15% Non- Fibrous Particles  
67% Volatile on Ignition  
18% Fiberglass*

*No Asbestos Detected  
55% Non- Fibrous Particles  
45% Volatile on Ignition*

*No Asbestos Detected  
57% Non- Fibrous Particles  
43% Volatile on Ignition*

*Bulk sample(s) from Trumbull Library, 33 Quality Street, Trumbull, CT collected by Dan Sullivan on 05/03/2016*

*Asbestos Identification in the samples. Examination made by Polarized Light Microscopy (PLM) per EPA Test Method 600/R-93/116*

**Sample Identification**

**Findings (Analyzed 05/16/2016)**

*190-612-6 Tan fibrous insulation (from sample #3)/Exterior, Roof R3*

*No Asbestos Detected  
54% Non- Fibrous Particles  
46% Volatile on Ignition*

*190-612-7 Black fibrous paper backing (from yellow foam board, from sample #1)/Exterior, Roof R1*

*No Asbestos Detected  
3% Non- Fibrous Particles  
93% Volatile on Ignition  
4% Fiberglass*

*190-612-8 Black fibrous paper backing (from yellow foam board, from sample #2)/Exterior, Roof R2*

*No Asbestos Detected  
7% Non- Fibrous Particles  
85% Volatile on Ignition  
8% Fiberglass*

*190-612-9 Black fibrous paper backing (from yellow foam board, from sample #3)/Exterior, Roof R3*

*No Asbestos Detected  
4% Non- Fibrous Particles  
90% Volatile on Ignition  
6% Fiberglass*

*190-612-10 Black/gray fibrous paper (from sample #1)/Exterior, Roof R1*

*No Asbestos Detected  
4% Non- Fibrous Particles  
92% Volatile on Ignition  
4% Fiberglass*

*190-612-11 Black/gray fibrous paper (from sample #2)/Exterior, Roof R2*

*No Asbestos Detected  
10% Non- Fibrous Particles  
82% Volatile on Ignition  
8% Fiberglass*

*190-612-12 Black/gray fibrous paper (from sample #3)/Exterior, Roof R3*

*No Asbestos Detected  
2% Non- Fibrous Particles  
96% Volatile on Ignition  
2% Fiberglass*

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Asbestos Identification in the samples. Examination made by Polarized Light Microscopy (PLM) per EPA Test Method 600/R-93/116

**Sample Identification**

190-612-13 Brown fibrous paper with black sticky tar (from sample #1)/Exterior, Roof R1

**Findings (Analyzed 05/16/2016)**

No Asbestos Detected  
43% Non- Fibrous Particles  
49% Volatile on Ignition  
8% Fiberglass

190-612-14 Brown fibrous paper with black sticky tar (from sample #2)/Exterior, Roof R2

No Asbestos Detected  
54% Non- Fibrous Particles  
43% Volatile on Ignition  
3% Fiberglass

190-612-15 Brown fibrous paper with black sticky tar (from sample #3)/Exterior, Roof R3

No Asbestos Detected  
45% Non- Fibrous Particles  
55% Volatile on Ignition  
<1% Fiberglass

190-612-16 Black fibrous shingle with black fibrous roofing tar and paper (on metal flashing, on black tar and paper flashing on wood)/Exterior, Front Edge Roof

No Asbestos Detected  
26% Non- Fibrous Particles  
53% Volatile on Ignition  
21% Fiberglass

190-612-17 Black fibrous shingle with black fibrous roofing tar and paper (under metal flashing, on wood)/Exterior, Front Edge Roof

No Asbestos Detected  
11% Non- Fibrous Particles  
76% Volatile on Ignition  
13% Fiberglass

190-612-18 Black fibrous shingle with black fibrous roofing tar and paper (on tan fibrous insulation, at chimney penetration)/Exterior, Roof R2

No Asbestos Detected  
18% Non- Fibrous Particles  
59% Volatile on Ignition  
23% Fiberglass

190-612-19 Black fibrous shingle with white and gray granules (on black tarpaper on wood)/Exterior, Pitched Shingled Transition Roof (from upper roof to lower roofs)

No Asbestos Detected  
36% Non- Fibrous Particles  
35% Volatile on Ignition  
29% Fiberglass

*Bulk sample(s) from Trumbull Library, 33 Quality Street, Trumbull, CT collected by Dan Sullivan on 05/03/2016*

*Asbestos Identification in the samples. Examination made by Polarized Light Microscopy (PLM) per EPA Test Method 600/R-93/116*

**Sample Identification**

*190-612-20 Black fibrous shingle with white and gray granules (on black tarpaper on wood)/Exterior, Pitched Shingled Transition Roof (from upper roof to lower roofs)*

**Findings (Analyzed 05/16/2016)**

*No Asbestos Detected  
41% Non- Fibrous Particles  
25% Volatile on Ignition  
34% Fiberglass*

*190-612-21 Black fibrous tarpaper (from sample #19)/Exterior, Pitched Shingled Transition Roof (from upper roof to lower roofs)*

*No Asbestos Detected  
2% Non- Fibrous Particles  
98% Volatile on Ignition  
<1% Fiberglass*

*190-612-22 Black fibrous tarpaper (from sample #20)/Exterior, Pitched Shingled Transition Roof (from upper roof to lower roofs)*

*No Asbestos Detected  
3% Non- Fibrous Particles  
78% Volatile on Ignition  
19% Fiberglass*

**PARAMETERS  
ASBESTOS PLM ANALYSIS  
(Revised 3/22/13)**

1. Materials which contain >1% asbestos (greater than 1%) by PLM (polarizing light microscopy) analysis are considered to be asbestos containing materials under EPA and the State of Connecticut Regulations. OSHA still regulates material with <1%. (Contact laboratory for information.) {Note: A more sensitive method is available called TEM (transmission electron microscopy). TEM may detect asbestos fibers that PLM cannot see, but the above agencies' enforcement is based on PLM analysis. Rules may differ for states other than Connecticut. It is best to check with the individual state. For example, New York State requires TEM confirmation of negative PLM results on floor tile}.
2. If no asbestos is detected in a sample, or if the asbestos content is less than 1% by PLM, additional samples of the same material should be submitted for confirmation. Please check with the laboratory for guidance on the number of samples needed. Sample collection in Connecticut must be by a DPH Licensed Asbestos Inspector. Many other states also require licensing.
3. Floor Tile Mastic: Mastic under floor tile should be separately sampled by scraping some of the mastic from the floor to avoid contamination from the floor tile.
4. Although Chem Scope, Inc. takes great effort to insure accuracy in the estimation of asbestos in the materials analyzed, no quantitation method is without some uncertainty. Based on independent calibration studies and comparison of Chem Scope's quantitative results with NVLAP and AIHA round robin programs we estimate our uncertainty in quantitation to be relatively small. The average relative uncertainty of the estimate is calculated to be 35% for samples that contain less than 10% asbestos. This means a estimate of 10% asbestos in a sample has a probable range of 6.5% to 13.5% while an estimate of 1% has a range of 0.65% to 1.35%.
5. The presence of non-asbestos components, which are recognized by the PLM analyst, is reported with the estimated amounts. This is not an exhaustive analysis for the non-asbestos materials since the primary purpose is to determine if asbestos is present and, if so, how much is present of each type of asbestos.
6. Results reported apply only to the sample(s) analyzed.
7. Special treatment of samples: Chem Scope, Inc. routinely uses gravimetric sample reduction techniques such as low temperature ashing or acid dissolution on samples like floor tile, roofing materials, glue dots, or high cellulose content samples prior to PLM analysis. These methods are used to aid in the PLM analysis and to provide better quantitative data. Layered samples, if possible, are analyzed separately as individual layers. However, in accordance with the method, if any layer contains >1% asbestos (greater than 1%) it is to be considered an asbestos containing material. All results are reported to the original sample basis.
8. Sample results are not corrected for blanks. Analytical blanks are run daily and if contamination is suspected the samples are rerun.
9. Chem Scope, Inc. performs "400 point" point counting when the asbestos content is visually estimated to be less than 10%. There is no additional charge for this analysis.

The Scope of Accreditation referenced in this report applies to bulk asbestos fiber analysis by PLM (Polarized Light Microscopy).

Accreditation does not imply endorsement by NVLAP, NIST or any Federal or State Agency.

This report pertains only to the samples tested and may not be reproduced in part.

Condition of the samples at the time of receipt was acceptable unless otherwise noted on the Certificate of Analysis.

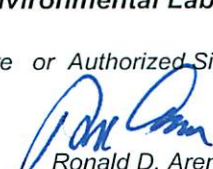
See test parameters above and attached chain of custody form.

We would love to hear from you. Comments? Questions? Please call or email us at [chem.scope@snet.net](mailto:chem.scope@snet.net)

**ChemScope, Inc. is accredited by AIHA LAP, LLC LAB #100134**

**NVLAP Lab Code 101061-0.**

**Connecticut Department of Public Health (DPH) Approved Environmental Lab PH 0581**

|                                                                                                             |                                                                                                                                  |                                                                                                                                                            |                                                                                                                                                       |                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br>Signature<br>Analyst | <br>Signature<br>(if applicable)<br>Inspector | <br>Authorized Signature or<br>Suzanne Cristante<br>Laboratory Director | <br>Authorized Signature or<br>Izabela Kremens<br>Quality Manager | <br>Authorized Signature<br>Ronald D. Arena<br>Senior Consultant |
|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|





## Dear Laboratory Customer or Potential Customer,

New laboratory accreditation standards require us to provide our clients information about our services to make sure that your requirements for testing are adequately defined, documented and understood. The following is for your information. Please call us if you have any questions or comments.

### Type of Samples

// PCM cassettes are routinely run by NIOSH Method 7400.  
// Bulk materials are run by EPA Method: #600/R-93/116.

**Air Samples:** NIOSH 7400 Method counts all fibers. This method may be used for personal air samples and for finals. Two field blanks must be submitted for each set of samples. In the unlikely event that there is to be any deviation from the standard test, you will be consulted by phone before the work begins. Those clients who have not had NIOSH 582 or AHERA asbestos training courses (either supervisor or project monitor) should consult with the lab director for more information. The test parameters are further explained in the analytical report.

**Bulk materials:** sampled are analyzed by the latest EPA Method: (#600/R-93/116) which uses polarized light microscopy (PLM). When asbestos is detected and the amount is estimated to be less than 10%, we automatically point count the samples. When there are interfering substances present, we may use ashing, acid washing or other procedures described in the method to handle the interference. Those clients who have not had AHERA asbestos training courses (either inspector, supervisor or project designer) should consult with the lab director for more information. The test parameters are further explained in the analytical report.

**All Samples** must be clearly labeled with source name and identification number or sufficient information from the client to make this sample uniquely identified. (We will then add our notebook #, page # (batch) and unique number within the batch.) Samples must be in a clean, air tight package such as a zip loc bag. Appropriate completed paperwork must accompany the sample. Bulk and air samples may not be submitted in the same package.

As soon as available bench top results will be faxed to you and reports will then be mailed. We will retain air samples for at least three months and bulk samples for 6 months unless you advise us otherwise.

You are welcome to visit the laboratory at any time to discuss the work, monitor the work or verify our testing services. We appreciate your business and encourage any feedback regarding improving our services or our quality system. Please take a minute to complete the following survey and mail/fax it to ChemScope, Inc.

### Customer Service Survey

To help us improve our services give your opinions to the following:

- 1- The printed laboratory report was complete and easy to understand. YES\_\_ NO\_\_  
If no, please explain \_\_\_\_\_.
- 2- The turn around time for results met your expectations/needs. YES\_\_ NO\_\_  
If no, please explain \_\_\_\_\_.
- 3- How likely are you to recommend ChemScope Inc. to someone?  
Excellent\_\_ Very Good\_\_ Good\_\_ Fair\_\_ Poor\_\_
- 4- How likely are you to return to ChemScope in the future if the need arises?  
Excellent\_\_ Very Good\_\_ Good\_\_ Fair\_\_ Poor\_\_
5. On a scale of 1 to 5 where 1 represents "Satisfied" and 5 represents "Dissatisfied", how would you rate your level of overall satisfaction.  
1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_
- 6- Please add any additional comments or suggestions that would be helpful when you use our services:  
\_\_\_\_\_

Name \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_ Telephone/e-mail \_\_\_\_\_

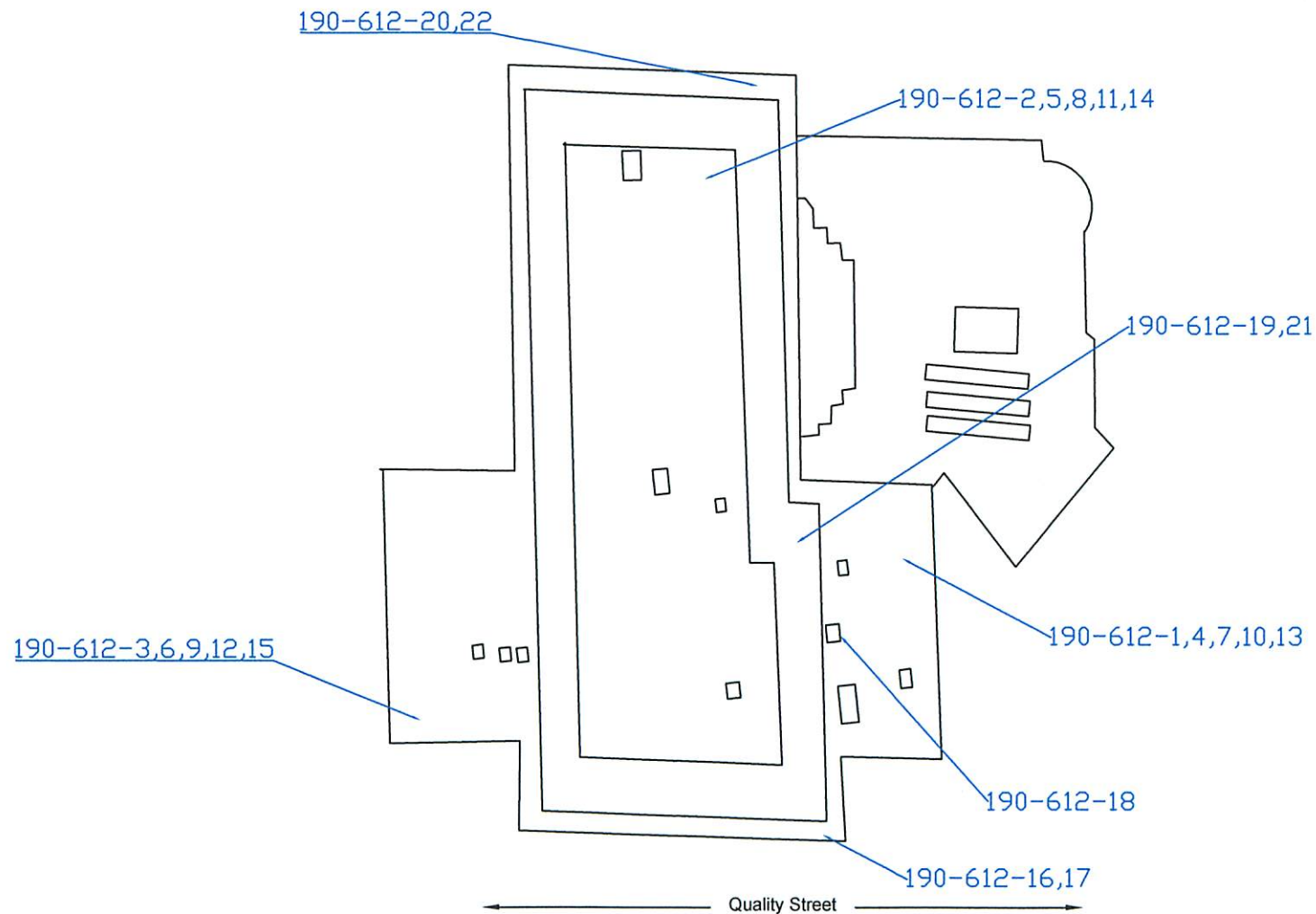
Can we contact you regarding this survey? YES\_\_ NO\_\_



# ChemScope Inc.

Trumbull Library  
33 Quality Street, Trumbull, CT  
Roof Plan  
CS#190-612, 05/03/2016

Bulk Sample Locations  
05/03/2016



## LEGEND OF SYMBOLS

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## NOTATIONS

DRAWN BY:

**ChemScope Inc.**

SHEET TITLE:

33 Quality Street  
TRUMBULL, CT

CHEMSCOPE NUMBER:  
CS# 190-612

SCALE:  
NOT TO SCALE

DATE:  
5/3/16

DRAWING NUMBER

**1 B**