COUNTY OF ROANOKE

FINANCE DEPARTMENT

PURCHASING DIVISION

Kate Hoyt
Buyer

P.O. Box 29800
5204 Bernard Drive SW, Suite 300F
Roanoke, VA 24018
Phone: (540) 283-8149
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October 7, 2019

INVITATION TO BID
#2020-026

Roof Removal & Replacement
at the
Bent Mountain Center

Mandatory Pre-Bid Meeting:
Tuesday, October 15, 2019
10:00 AM
10148 Tinsley Lane, Bent Mountain VA 24059

Sealed Bids Due:
October 24, 2019
2:00 PM
(Local Prevailing Time)
One (1) Original
Three (3) Complete Copies
One (1) Electronic Copy

INVITATION TO BID #2020-026

GENERAL INFORMATION

The County of Roanoke, Virginia, is requesting sealed bids from qualified vendors to provide roof removal and replacement at the Bent Mountain Center.

A MANDATORY pre-bid conference will be held on **October 15, 2019, at 10:00 AM(EST)** to provide site visits and answer questions. This meeting will be held at the Bent Mountain Center, 10148 Tinsley Lane, Bent Mountain, VA 24059. **This meeting is MANDATORY. Only bids received from attendees of this meeting will be considered for award.** Offerors are not to visit the site or have conversations with personnel prior to or subsequent to this scheduled conference.

SCOPE OF WORK

The Scope of Work includes, but is not limited to, the following items;

1. Removal of ballasted EPDM roofing;
2. Removal of a built-up roofing;
3. Replacement of those roof areas with a new TPO roof;
4. Repairs to an existing slate roof;
5. Asbestos abatement as necessary to remove and replace the roof;
6. Removal and replacement of water damaged wooden roof support decking;
7. Installation of a new permanent roof access ladder.

SPECIFICATIONS

Please see attached plans for project specifications.
General & Supplemental General Conditions are provided as Attachment A to this IFB document.

A description and/or listing of the services and/or items that the successful bidder will be required to provide to the County under the contract resulting from this IFB, are those that are set forth herein and/or referred to in any way in any terms and conditions, and/or any attachments referred to in this IFB. Each bidder should carefully read and review all such documents.

Roanoke County shall provide the mechanism for the evaluation of all information received, the final determination of responsible bidders, and reserves the right to waive informalities and/or irregularities and to accept or reject any or all proposals. The County reserves the right to split awards if it is in the best interest of the County.

SCHEDULE

All specified work shall be completed within sixty (60) days of the issuance of the Notice to Proceed.

CONTRACTOR USE OF FACILITIES

The Bent Mountain Branch Library and Bent Mountain Center will remain operational during the construction. Therefore, the existing parking areas must be kept available for public use.

The Contractor shall, on a daily basis, keep the premises and surrounding area free from accumulation of materials and debris.

INSTRUCTIONS TO BIDDERS

I. GENERAL

1. The intent of the drawings and specifications is that the Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the work in accordance with the Contract Documents and all incidental work necessary to complete the project in an acceptable manner, ready for use, occupancy or operation by the Owner.

2. Any item that is shown on the plans but not mentioned in the specifications, or mentioned in the specifications but not shown on the plans, shall be considered as being both shown on the plans and mentioned in the specifications.

3. The entire work provided for in the specifications and shown on the plans is to be accomplished even though every item and minor detail for the proper installation and successful operation of the entire work is not mentioned in the specifications or shown on the plans.

4. The cost of any item whatsoever not listed in the Bid Form, yet, which is mentioned in the specifications or shown on the plans, shall be considered to be included in the cost of some other item of Bid in the Bid Form.

5. "Contract Documents" shall include the Invitation to Bid, the Instructions to Bidders, the Bid Form, the Contract Forms, the Bonds, the General and Special Conditions, the Technical Specifications, any Addenda or Change Orders, any Detailed Drawings and the Construction Plans.

6. Should there be any questions concerning the Contract Documents, the prospective Bidder shall bring the same to the attention of the Owner in writing. Should the prospective Bidder fail to do so before submitting a bid, the Bidder shall accept the resolution of any question provided by the Owner.

7. Any permits obtained by the Owner or contractor shall be made part of and attached to the Contract Documents.

8. The Contractor is responsible for compliance with all Federal, State, and local laws, ordinances, and licenses required for this project.

II. QUALIFICATIONS OF BIDDERS

1. The County of Roanoke may conduct an investigation, as it deems necessary, to determine the ability of the Bidder to perform the work in accordance with the time schedule included in the Contract Documents, and, if such an investigation is performed, the Bidder shall furnish the County all information and data requested by the County. The County reserves the right to reject any bid if the evidence submitted by, or the investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligation of the Contract Documents and to complete the work contemplated therein in accordance with established completion schedule.

2. Bidders shall, when requested by the County, be prepared to furnish, in writing, the following information within three (3) working days after receipt of such request:

   a. The permanent business address of the Bidder.

   b. Whether the Bidder has plant and equipment adequate to perform the work properly and expeditiously, and if so, a list of the plant and equipment available for this work.

   c. Whether the Bidder has appropriate technical experience, and if so, a description of the projects which Bidder has carried out, together with the names and addresses of the engineers in charge of the work.

   d. A financial statement, under oath, showing the assets, obligations and net worth of the Bidder, and the name of banking connections, said statement to be current to the month within which the bid was submitted.

III. INTERPRETATION OF CONTRACT DOCUMENTS

1. All questions concerning the meaning or intent of the Contract Documents shall be submitted in writing to the County in care of the Buyer on record. Replies will be issued by addenda posted publicly to the project website. Questions received less than 5 days prior to the date for opening of the Bids will not be answered. Only questions answered by formal written addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

IV. PREPARATION OF BIDS

1. Each Bidder is urged to examine carefully the Contract Documents for the work. The County of Roanoke will assume that the Bidder has considered the character, quality, and quantities of work to be performed, the materials to be furnished and the requirements of the Contract Documents. The submission of a Bid shall be considered evidence that the Bidder has made such examination.

2. Bids must be submitted upon the blank Bid Form provided in the Contract Documents. Except as may be otherwise noted, the blank spaces in the Bid Form must be filled in and no changes shall be made in the phraseology of the Bid Form.

3. A Bid Form that contains any omissions, erasures, alterations, items not called for or irregularities of any kind, at the discretion of Roanoke County, may be rejected as informal.

4. The Bid Form shall specify the Base Bid, written with ink or typed in both words and figures, for which the work will be performed according to the Contract Documents. In the event of discrepancy between the two expressed Base Bids, the word amount shall govern. Any unit prices for separate items or any Alternates as called for in the Bid Form shall be written with ink or typed in figures in the appropriate blanks.

5. Each Bidder shall comply with all applicable Roanoke County Ordinances and State of Virginia Laws. Each Bidder is required, under Chapter 7 of the Virginia Code of 1950, as amended, to show evidence of a Certificate of Registration before a Bid can be received and considered. Each Bidder will place Bidder's State Registration Number in the appropriate blank on the Bid Form.

V. SUBMISSION OF BIDS

1. The Bid Form, the Bid Security, and any other Document required to be submitted as the Bid shall be enclosed in a sealed envelope and addressed as follows:

County of Roanoke
c/o Kate Hoyt
5204 Bernard Drive SW
Suite 300F
Roanoke VA 24018-0798

Place in the lower left-hand corner of the envelope the project title as indicated at the top of the Invitation to Bid. Place in the upper left-hand corner of the envelope the Bidder's name, State Registration Number and mailing address.

2. The Bidder is responsible for the timely delivery at the location designated for receipt of Bids.

3. Bids shall be delivered to the designated location prior to the time and date for receipt of Bids indicated in the Invitation to Bid. Bids received after that time and date will be returned unopened.

4. Each Bid must be accompanied by a Bid Security in an amount equal to five percent (5%) of the Base Bid. The Bid Security shall be in the form of Cash, Letter of Credit issued by a Banking Institution, Certified Check or Bid Bond payable to the County of Roanoke. The Bid Bonds shall be duly executed by the Bidder as Principal and a Corporate Surety authorized to do business in the State of Virginia.

VI. WITHDRAWAL OF BIDS

1. Bids may be withdrawn at any time prior to the time and date of the Opening of Bids.

2. After the opening of the Bids, Bidders may only withdraw Bids that were substantially lower than other Bids because of clerical error. The Bidder must give to the County of Roanoke notice in writing of Bidder's request to withdraw the Bid within two (2) business days after the conclusion of the Opening of Bids.

VII. OPENING OF BIDS

1. No responsibility will be attached to the County of Roanoke for the premature opening of Bids not properly addressed and identified, as stipulated in Paragraph VI.1.

2. Bids will be opened and read aloud at the time, date and place stipulated in the Invitation to Bid and the contents made public for the information of the Bidders and other interested persons.

VIII. REJECTION OF BIDS

1. The County of Roanoke reserves the right to waive any informalities in the Bids and to reject any or all Bids, should it be deemed in the best interest of the County of Roanoke.

2. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the same Contract shall cause the rejection of all Bids in which that Bidder is interested.

3. The Bid security will be promptly returned to all Bidders of rejected bids after the County of Roanoke and the Accepted Bidder have executed the Contract.

4. Should no award or written "Notice of Bid Acceptance" have been made by the County of Roanoke ninety (90) consecutive calendar days after the Opening of Bids, the Bidder may obtain the Bid Security from the Roanoke County Purchasing Division.

5. The County reserves the right to negotiate with the low bidder if the low bidder is greater than the budget for the project.

IX. ACCEPTANCE OF BIDS

1. The County of Roanoke reserves the right to accept alternates in any order or combination or to award the Contract to a Bidder other than the low Bidder, should it be deemed in the best interest of the County of Roanoke.

2. Within ninety (90) consecutive calendar days after the Bid Opening date, the County of Roanoke may give written "Notice of Bid Acceptance." The successful Bidder shall be required to execute the Contract and furnish the County of Roanoke a Performance Bond and a Labor and Material Payment Bond each in the amount of One Hundred percent (100%) of the Contract amount, all of which shall be completed on blank forms provided in the Contract Documents, with a surety on each Bond provided by a Security Company authorized to transact business in the State of Virginia. Attorneys-in-fact who execute Contract Bonds must file with each bond a certified copy of their Power of Attorney dated the same date as the Bonds are executed. (See Attachment A: General & Supplemental General Conditions, Section 22 & 29)

3. Within ten (10) consecutive calendar days from the receipt of written notice from the Roanoke County Purchasing Office, the successful Bidder shall execute the Contract with and furnish to the County of Roanoke the required bonds.

4. Upon the execution of the Contract and approval of the Bonds, the Bid Security shall be returned to the successful Bidder. Should the successful Bidder fail or refuse to execute the Contract or furnish the required Bonds within the stipulated time, the Bid Security shall be forfeited to the County of Roanoke as liquidated damages.

5. Work shall commence only upon the receipt of a written "Notice to Proceed" from the owner. The consecutive calendar days for completion shall start from the date stipulated in the written "Notice to Proceed."

6. The Contractor shall be required to furnish a schedule for the timely completion of the project prior to beginning work and from time to time during construction submit on the same schedule the actual work completed. For projects exceeding 90 days the Contractor shall furnish a cost loaded Critical Path Method (CPM) schedule. The schedule shall be updated monthly.

SUBMISSION OF THE BID

One (1) Original, three (3) complete copies and, one (1) Electronic Copy (USB preferred), of the sealed bid will be accepted at and until **2:00 PM (local prevailing time) on October 21, 2019**, at the Department of Finance, Purchasing Division, 5204 Bernard Drive, Suite 300F, Roanoke, VA 24018. As this is a sealed formal Invitation to Bid, emailed or faxed bids will NOT be accepted. Bids not received by the date and time listed above will be returned to the Offeror unopened. The bid package must be clearly marked with **"IFB #2020-026 BENT MOUNTAIN ROOF REPLACEMENT."**

It is not the intent of the specifications to be proprietary, nor to exclude any manufacturer or dealer. Deviations will be given consideration if they are considered to be suitable and acceptable for comparison. Any deviations must be submitted, in writing, with your bid. Deviations discovered after bid award or material receipt, not stated in your bid, shall be grounds

for disqualification and nullification of order. It is the responsibility of the Offeror to prove that the deviation is equal to the product/service specified. The County of Roanoke will make the final determination as to whether the product is equivalent.

EVALUATION OF THE BID

The County of Roanoke shall provide the mechanism for the evaluation of all information received, the final determination of responsible Offerors, and reserves the right to waive informalities and irregularities and to accept or reject any or all bids. Roanoke County reserves the right to procure from State Contracts when it is in our opinion that the State Contract is in the best interest of Roanoke County. Roanoke County retains the right to split items to multiple suppliers.

Individuals with disabilities, who require assistance or special arrangements in order to participate in bidding, please contact us. We require that you provide at least 48 hours notice so that reasonable efforts may be made to provide the proper arrangements. You may be requested to specify the nature of any accommodation or assistance, which may be required for your participation.

FOR QUESTIONS REGARDING THE BID, PLEASE CONTACT:

Kate Hoyt, Buyer
5204 Bernard Dr., SW, Suite 300F
Roanoke, VA 24018
Telephone: 540-283-8149
Email: khoyt@roanokecountyva.gov

Any inquiries or questions concerning specifications or bid submission should be submitted in writing. Written responses will be provided on our Purchasing Website in the form of an Addendum. It is the responsibility of the Offeror to periodically check our website for any addendum or sign up for email or text notification using the 'Notify Me' module.

NO CONTACT POLICY

Any contact initiated by any Offeror with any County representative, other than the purchasing representative listed herein, concerning this Invitation for Bids is prohibited. Any such unauthorized contact may cause disqualification of the Offeror from this procurement transaction.

GENERAL TERMS, CONDITIONS, AND INSTRUCTIONS –IFB (Revised 04/2013)

READ CAREFULLY - FAILURE TO COMPLY WITH EACH AND EVERY PROVISION OF THIS INVITATION AND THE SPECIFICATIONS ARE GROUNDS TO DISQUALIFY A BIDDER

Wherever the term Roanoke County, County or Roanoke County Board of Supervisors is used it is understood to include the Roanoke County School Board, in addition, any contract awarded from this solicitation may be used by Roanoke County Public Schools and any other public entity for which the County of Roanoke acts as a fiscal or purchasing agent.

Individuals with disabilities, who require assistance or special arrangements in order to participate in bidding, please contact (540) 772-2061. We require that you provide at least 48 hours' notice so that reasonable efforts may be made to provide the proper arrangements. You

may be requested to specify the nature of any accommodations or assistance, which may be required for your participation.

SUBMISSION AND RECEIPT OF BIDS:

(a) To be considered, all bids must be delivered in a sealed envelope, clearly marked with the words "BID DOCUMENTS", bid number and the name of the item being bid and received in the Roanoke County Finance Department/Purchasing Division no later than the specified date and time for the bid opening. Failure to timely submit such bid shall disqualify the bidder and such bid will be returned to the bidder unopened. NO FAXED BIDS WILL BE ACCEPTED.

(b) Unless otherwise specified, bidders must use the invitation to bid form furnished by the County. Failure to do so shall be grounds for rejection of the bid.

(c) Bids having any erasures or corrections must be initialed in ink by the bidder. An authorized officer of the company must sign bids in ink. Such authorization shall be a part of the bid document. All bids must either be typewritten or printed in ink.

(d) The original copy of the bid must not be permanently bound and one (1) electronic copy is preferred.

IMPORTANT NOTICE EFFECTIVE 3/14/2011 - ADDENDUMS, BIDS, RFPs, TABULATIONS AND NOTICES OF AWARD:

Vendors may visit http://roanokecountyva.gov/list.aspx to sign up to receive emails or text message notices about bids, proposals, addendums, bid tabulation and awards. Vendors can sign up to receive notification in selected commodity/service categories. It is the vendor's responsibility to keep information current in the system in order to receive the notifications. The sign up only requires an email address and/or a cell phone number for receiving text messages (if your phone is capable) and your choice of categories.

Although '**Notify Me'** will be the only way to receive automatic notification, all BIDS/RFP Information will continue to be posted on our website, , and can be picked up at the Purchasing Division, 5204 Bernard Drive, Suite 300F, Roanoke, VA 24018. Phone # (540) 772-2061.

PRICES TO BE FIRM:

The bidder warrants, by virtue of bidding, that the prices, terms and conditions quoted in his bid will be firm for a period of 60 days from the date of the bid opening.

NET 30 after receipt of invoice. Price should include shipping.

INVOICES:

The contractor must send all invoices directly to the payment address shown on the purchase order/contract and must submit invoices for items ordered, delivered and accepted by Roanoke County. All invoices must show the purchase order/contract number. All contractors need to be properly registered as a payment vendor for the County in order to receive payment. All vendors previously registered are still in the system as a payment vendor. This system will no longer be used for notification of bids/RFPs.

PERFORMANCE BOND:

At the time of or prior to the execution of the contract, the County reserves the right to require the bidder or contractor to furnish a performance and/or labor and material payment bond with corporate surety, satisfactory to the County of Roanoke, in the amount of the contract price.

DELIVERY POINT:
Unless otherwise indicated, all items shall be delivered F.O.B. with destination and delivery charges included in the bid price. F.O.B. destination is interpreted to mean unloading and placing in the building or area as directed by the County.

CASH DISCOUNTS:
In determining the award of a bid, cash discounts for prompt payment will be considered. Discount time period computation shall commence from and after complete delivery, in satisfactory condition, and receipt of a properly documented invoice.

BRAND NAMES:
When a brand name appears in the specifications, it is solely for the purpose of establishing a grade or quality of material. The County does not wish to rule out other brands or manufacturers; therefore, the words "EQUIVALENT TO" are automatically included. However, if a product other than that specified is bid, it is the vendor's responsibility to prove to the County that said product is equivalent to that specified in the bid.

QUALITY:
All materials used for the manufacture or construction of any supplies, materials, or equipment covered by this bid shall be of the best quality available.

ACCEPTANCE OF MATERIAL:
Until such time as all the conditions in the contract are fulfilled, the County reserves the right to refuse and return material, at the seller's expense.

WARRANTY/RETURNS:
Clearly specify your warranty of product and handling of returns, including turnaround time on faulty equipment. Warranties and other technical data are to be included.

DELIVERY:
Time is of the essence for delivery of any items, products or service procured as a result of this bid. If delivery is not made at the time specified on the Invitation to Bid form, the County reserves the right to call in any and all bonds or other security given for performance, to cancel the order, or any part thereof, without obligation, to declare the seller in default, and to disqualify the seller from bidding on future County contracts.

DEFAULT PROVISION:
In case of default by the contractor, the County shall have the sole discretion to procure the articles or services from other sources. The defaulting contractor shall be liable for any and all costs in excess of the contract price occasioned by or resulting from such default whether directly or indirectly, which sums may be paid or credited from any forfeited bond or other security.

PRICING:

In the event of discrepancy between the total pricing and unit prices, the County in its sole discretion, shall determine the bid price.

Negotiation with lowest responsible Bidder: The County of Roanoke reserves the right to negotiate with the lowest responsible bidder if the low bid exceeds available funds. This provision will be used in accordance with County Code Chapter 17 (Ord. No. 3350, S2-30, 12-14-82). State Code 2.2.4318.

COPYRIGHTS OR PATENT RIGHTS:
The bidder warrants that there have been no violations of copyrights or patent rights in the manufacture, production or sale of the goods shipped or ordered as a result of this bid. The bidder agrees that the County of Roanoke shall be indemnified and held harmless from any and all liability or expense occasioned by any such violations.

FEES INCLUDED IN BID PRICE:
Submitted bids shall include in the price, the cost of any Business and/or Professional licenses, permits or fees as required by law.

TAX EXEMPTION:
The County of Roanoke is exempt from any taxes imposed by State and/or Federal Government. Upon notification, the County will furnish a certificate of tax exemption.

CERTIFICATION AND ABILITY:
The County of Roanoke reserves the right to request from the bidder, a separate manufacturer's certification of all statements made in the bid. The County may request any or all bidders to furnish proof of experience, ability and financial standing.

SIGNED BID CONSIDERED AN OFFER:
THIS INVITATION TO BID MUST BE SIGNED AS HEREIN PROVIDED. Submission of this signed invitation shall be considered an offer by the bidder or contractor to sell the items or services as required in the specifications. All bids are subject to approval by the County Board of Supervisors. In the case of default by the bidder or contractor after acceptance of a bid, the County of Roanoke may take such action, as it deems appropriate, including forfeiture of any and all bonds or other security and legal action for damages or specific performance.

NO BID:
To insure that your name remains on our bid listing, should you desire not to bid on a particular project, return the completed bid package marked with the words "NO BID". Failure to return to the County a bid or "NO BID" may cause your name to be removed from our listing.

COMPLIANCE WITH LAWS:
The bidder is responsible for compliance with all Local, State and/or Federal laws and regulations. The County of Roanoke shall be held harmless from any liability.

AUTHORITY TO TRANSACT BUSINESS IN VIRGINIA:
A Contractor organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 of the Code of Virginia or as otherwise required by law.

Any business entity described herein that enters into a Contract with the County pursuant to the Virginia Public Procurement Act 2.2-4300 et seq. shall not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50 of the Code of Virginia, to be revoked or cancelled at any time during the term of the Contract. The County may void any Contract with a business entity if the business entity fails to remain in compliance with the provisions of this section. All corporations, LLC's and LLP's shall be registered with the State Corporation Commission. To determine whether your firm should register, please contact the SCC.

By my signature on this solicitation, I certify compliance with federal, state, and local laws and regulations applicable to the performance of the services described herein.

ACCEPTANCE OR REJECTION OF BIDS:
The County of Roanoke reserves the right to accept or reject any or all bids/offers. The County also reserves the right to award the contract for any such materials, goods or services the County deems will best serve its interests. It further reserves the right to award the contract on a split order basis, lump sum or individual basis, or such combinations as shall best serve the interest of the County. Roanoke County reserves the right to make a site visit to the facility prior to bid award.

RULING LAW:
This invitation to bid and any contract executed pursuant hereto of which this invitation shall be an internal part shall be governed, controlled and interpreted in accordance with the laws of the Commonwealth of Virginia without reference to its conflict of law principles. Each party to such contract shall thereby submit to the exclusive jurisdiction of the Circuit Court of the County of Roanoke or, in the event that jurisdiction is authorized, to the United States District Court for the Western District of Virginia, sitting at Roanoke, Virginia.

NONDISCRIMINATION PROVISIONS:
During the performance of this contract, the contractor will not discriminate against any employee or applicant for employment because of age, race, religion, color, sex or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.

INSURANCE
The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

Claims under workmen's compensation, disability benefit and other similar employee benefit acts; and

Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees; and

Claims for damages because of bodily injury, sickness liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

Claims for damages because of bodily injury, sickness, or disease, or death of any person other than his employees; and

Claims for damages because of injury in or destruction of tangible property, including loss of use resulting there from.

Certificates of insurance acceptable to the OWNER shall be filed with the OWNER prior to coverage's afforded under the policies will not be canceled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified:

CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a UBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than $1,000,000 for all damages arising out of bodily injury, including death, at any time resulting there from, sustained by any one person in any one accident; and a limit of liability of not less than $1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $1,000,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $1,000,000 aggregate for any such damage sustained by two or more persons in any one accident.

The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the WORK is performed. Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require each SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous WORK under this CONTRACT at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

QUESTIONS REGARDING THE BID:

Questions should be directed to:
Kate Hoyt, Buyer
5204 Bernard Dr., SW, Suite 300F
Roanoke VA 24018
Telephone: 540-283-8149
Email: khoyt@roanokecountyva.gov

SPECIAL INSTRUCTIONS:

ANTITRUST:
By entering into a contract, the bidder conveys, sells, assigns, and transfers to Roanoke County all rights, title, and interest in and to all causes of the action it may now or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by Roanoke County under said contract.

ASSIGNMENT OF CONTRACT:
A contract shall not be assignable by the contractor in whole or in part without the written consent of Roanoke County.

AVAILABILITY OF FUNDS:
It is understood and agreed between the parties herein that Roanoke County shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this contract.

IMMIGRATION REFORM AND CONTROL ACT OF 1986:
By signing this bid, the bidder certifies that the firm does not and will not during the performance of this contract employ illegal alien workers or otherwise violate the Federal Immigration Reform and Control Act of 1986.

ANTI-COLLUSION CERTIFICATION:
By my signature on the face of this bid, I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services, and is in all respects fair and without collusion or fraud. I understand collusive bidding is a violation of the Virginia Governmental Frauds Act and Federal Law and can result in fines, prison sentences, and civil damage awards. I agree to abide by all conditions of this bid and certify that I am authorized to sign this bid for the bidder.

KICKBACKS:
I certify and warrant that by my signature on this solicitation, neither I nor the bidder for whom I am authorized to act has offered or received any kickback from any other bidder, supplier, manufacturer, or subcontractor in connection with bid on this contract, subcontractor in order, in the form of any payment, loan, subscription, advance, deposit of money, services or anything, present or promised, unless consideration of substantially equal or greater value is exchanged. Further, no person shall demand or receive any payment, loan, subscription, advance, deposit of money, service, or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value is exchanged.

DEBARMENT:
By my signature on this solicitation, I certify that this person/firm/corporation is not currently barred from bidding on contracts by any agency of the Commonwealth of Virginia or the federal government of the United States of America, nor is this person/firm/corporation a part of any

firm/corporation that is currently barred from bidding on contracts by any agency of the Commonwealth of Virginia or the federal government of the United States of America. I have attached an explanation of the previous debarment(s) and copies of notice(s) of reinstatement(s).

INDEMNIFICATION:
To the fullest extent permitted by law, the Vendor shall indemnify and hold harmless the County of Roanoke and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to, attorneys' fees, arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting there from, and (2) is caused in whole or in part by any negligent act or omission of the Vendor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph.

The County cannot legally agree to any clause indemnifying the contractor from any damages arising out of the contract or holding the contractor harmless. The submission of a bid or proposal means that the contractor agrees not to request such language in the resulting contract.

CONTRACT:
Any contract resulting from his bid shall consist of the following documents: the General Terms and Conditions and the Specifications, both of which are contained in the Invitation for Bid, together with the bidders response, which consists of this document, the Price Schedule and other bid documents attached hereto or submitted with this document.

DRUG-FREE WORKPLACE:
During the performance of this contract, the contractor agrees to (i) provide a drug-free workplace for the contractor's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in violation of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the contractor that the contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over $10,000, so that the provisions will be binding upon each subcontractor or vendor.

For the purposes of this section, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a contractor in accordance with this chapter, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

DATA ON CONVICTIONS FOR CERTAIN CRIMES AND CHILD ABUSE AND NEGLECT:
The contractor certifies that none of the persons who will provide services on school property or

requiring direct contact with students has been convicted of any of the following felony or misdemeanor offenses: felony sex or violence offenses, other felony offenses or misdemeanor sex offenses within the past ten years.

The contractor further understands and acknowledges (1) that if he makes a materially false statement regarding any of the above offenses, he will be guilty of a Class 1 misdemeanor and may forfeit profits derived from the contract. Further, the contractor understands and acknowledges that before any person is permitted to provide such services subsequent to this certification, he must complete a new certification regarding such person in a form satisfactory to the School Board. The required certification form is attached hereto.

PROPRIETARY INFORMATION:

Ownership of all data, materials, and documentation originated and prepared for the County of Roanoke pursuant to the INVITAITON FOR BID shall belong exclusively to the County and be subject to public inspection in accordance with the Virginia Freedom of Information Act. Trade secrets or proprietary information submitted by a bidder shall not be subject to public disclosure under the Virginia Freedom of Information Act; however, the bidder must invoke the protections of Section 2.2-4342F of the Code of Virginia, in writing, either before or at the time the data or other material is submitted.

The bidder must specifically identify the data or materials to be protected and state the reasons why protection is necessary on the "Notice of Proprietary Information Form" below. In addition, the proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining in the Bid and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information.

The classification of an entire bid document, line item prices, and/or total bid prices as proprietary or trade secrets is not acceptable and may result in rejection of the bid.

DATA ON CONVICTIONS FOR CERTAIN CRIMES AND CHILD ABUSE AND NEGLECT

CERTIFICATION OF CONTRACTOR

Full Name of Contractor:_____

Description of Contract: Bent Mountain Center Roof Replacement

As required by Section 22.1-296.1 of the Code of Virginia, the undersigned hereby certifies that none of the persons who will provide services requiring direct contact with students on school property during school hours or during school-sponsored activities has been convicted of a felony or any offense involving the sexual molestation, physical or sexual abuse or rape of a child.

I further understand and acknowledge (1) that if I make a materially false statement regarding any of the above offenses, I will be guilty of a Class 1 misdemeanor and (2) that before any person is permitted to provide such services subsequent to this certification, I must complete a new certification regarding such person.

Date:_____ _____

Name of Contractor

By:_____

_____

TITLE

NOTICE OF PROPRIETARY INFORMATION FORM
INVITATION TO BID #2020-026 BENT MOUNTAIN CENTER ROOF REPLACEMENT

Confidentiality References Protection in Accordance with the Code of Virginia, Section 2.2-4342

Section Title	Page #	Reason(s) for Withholding from Disclosure

INSTRUCTIONS: Identify the data or other materials to be protected and state the reasons by using the codes listed below. Indicate the specific words, figures, or paragraphs that constitute trade secrets or proprietary materials. The classification of an entire bid or proposal document, line item prices, and/or total bid or proposal prices as proprietary or trade secret is not acceptable and will result in rejection of the bid or proposal.

A) This page contains information relating to "trade secrets", and "proprietary information" including processes. Operations, style of work, or apparatus. Identify confidential statistical data. Amount or source of any income...of any person (or) partnership. See Virginia Public Procurement Act. Section 2.2-4342. Unauthorized disclosure of such information would violate the Trade Secrets Act 18 U.S.C. 1905.

B) This page contains proprietary information including confidential, commercial or financial information, which was provided to the Government on a voluntary basis and is of the type that would not customarily release to the public. See Virginia Public Procurement Act, Section 2.2-4342; 5 U.S.C. 552 (b) (4); 12 C.F.R. 309.5(c) (4).

C) This page contains proprietary information including confidential, commercial or financial information. The disclosure of such information would cause substantial harm to competitive position and impair the Government's ability to obtain necessary information from contractors in the future. 5 U.S.C. See Virginia Public Procurement Act. Section 2.2-4342; 552 (b) (4)12 C.F.R. 309.5(c) (4).

PRICE FORM AND SIGNATURE PAGE
INVITATION TO BID #2020-026 BENT MOUNTAIN CENTER ROOF REPLACEMENT

Item	Cost
Base Bid	
Hauling ($/ton/mile)	
Curb Replacement for exhaust fans, etc. ($/per typical replacement)	
Cap Flashing Replacement ($/per linear foot, for any additional beyond Drawings)	
Parapet Blocking ($/per 12'-0" section, including bolting)	
Roof Drain Replacement ($/per roof drain, additional to Drawings)	
Roof Drain Supports ($/per roof drain location, additional to Drawings)	
Thru-Wall scupper Replacement ($/per typical replacement)	
Roof Decking Replacement ($/per square foot of roof area)	

BIDDERS SIGNING THE BID FORM AGREE THAT THE PRODUCT BEING BID CONFORMS TO ALL SPECIFICATIONS LISTED IN THE BID. BIDDER CERTIFIES THAT BY SUBMISSION OF THIS BID, HE HAS READ AND AGREES TO THE TERMS AND CONDITIONS SET FORTH IN THIS INVITATION TO BID.

DATE _____ PAYMENT TERMS ___NET 30___

COMPANY NAME _____

ADDRESS _____ PHONE # _____

_____ FAX # _____

_____ EMAIL _____

FEIN _____ VA BUSINESS LICENSE NO. _____

VIRGINIA SCC # OR STATEMENT DESCRIBING WHY FIRM IS NOT REQUIRED TO BE SO AUTHORIZED PER VA CODE §2.2-4311.2 _____

_____

SIGNATURE / TITLE _____

NAME / TITLE (please print) _____

To receive consideration for award, this signature sheet must be returned to the Purchasing Division, as it shall be a part of your response.

INVITATION TO BID #2020-026 BENT MOUNTAIN CENTER ROOF REPLACEMENT
Attachment A

GENERAL & SUPPLEMENTAL GENERAL CONDITIONS

GENERAL CONDITIONS

1. DEFINITIONS

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicate which shall be applicable to both the singular and plural thereof:

1.2 ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement, which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS, and SPECIFICATIONS, by additions, clarifications or corrections.

1.3 BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 BIDDER - Any person, firm, or corporation submitting a BID for the WORK.

1.5 BONDS - Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACTOR and his surety in accordance with the CONTRACT DOCUMENTS.

1.6 CHANGE ORDER - A written order to the CONTRACTOR authorizing an addition, deletion, or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

1.7 CONTRACT DOCUMENTS - The contract, including Advertisement for Bids, Information for Bidders, General Conditions, Supplemental General Conditions, BID, Technical Specifications and Special Conditions, Bid Bond, Agreement, Payment Bond, Performance Bond, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.

1.8 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

1.9 CONTRACT TIME - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.

1.10 CONTRACTOR - The persons, firm, or corporation with whom the OWNER has executed the Agreement.

1.11 DRAWINGS - The part of the CONTRACT DOCUMENTS, which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

1.12 ENGINEER - The Roanoke County Engineer or person, firm, or corporation designated by the OWNER to supervise the WORK and/or administer the CONTRACT DOCUMENTS.

1.13 FIELD ORDER - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

1.14 FINAL COMPLETION - The date as certified by the ENGINEER that the WORK has been completed in accordance with the CONTRACT DOCUMENTS and that final payment can be made. FINAL COMPLETIONS includes: 1) submission of Operation & Maintenance Manuals and 2) Record Documents and 3) completion of all punch list items.

1.15 NOTICE OF AWARD - The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

1.16 NOTICE TO PROCEED - Written communication issued by the OWNER or authorized agent to the CONTRACTOR authorizing the Contractor to proceed with the WORK and establishing the date of commencement of the WORK.

1.17 OWNER - The Board of County Supervisors for Roanoke County, Virginia, or their authorized agent.

1.18 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

1.19 RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the OWNER who is assigned to the project site or any part thereof.

1.20 SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules, and other data, which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER, or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.21 SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.22 SUBCONTRACTOR - An individual, firm, or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.23 SUBSTANTIAL COMPLETION - That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended. SUBSTANTIAL COMPLETION includes: 1) a Certificate of Occupancy from the Building Official / Authority Having Jurisdiction, 2) delivery of extra stock materials, 3) OWNER training & demonstrations, 4) submittal of CONTRACTOR's internal punch list with identification of incomplete items.

1.24 SUPPLEMENTAL GENERAL CONDITIONS - Modifications to General Conditions required for the PROJECT, or such requirements that may be imposed by applicable state laws, or required to clarify or amplify the General Conditions.

1.25 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.26 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.27 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at their last given address, or delivered in person to said party or their authorized representative on the Project. Email notification is an acceptable form of WRITTEN NOTICE.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

2.2 The additional drawings and instruction thus supplied will become a part of the CONTRACT DOCUMENTS. CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS, AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedule, payrolls, reports, estimates, records, and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

3.2 Prior to beginning work the CONTRACTOR shall submit a construction progress schedules showing the order in which the CONTRACTOR proposes to carry out the WORK, including dates at which the CONTRACTOR will start the various parts of the WORK, estimated date of completion of each part, and, as applicable:

3.2.1 The dates at which special detail drawings will be required; and

3.2.2 Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.2.3 For projects exceeding 90 days the CONTRACTOR shall submit a cost loaded Critical Path Method (CPM) schedule. The cost loaded CPM schedule shall be updated and submitted on a monthly basis in conjunction with the CONTRACTOR's payment applications.

3.3 CONTRACTOR shall also submit a schedule of payments anticipated to be earned during course of WORK.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between DRAWINGS and SPECIFICATIONS, the most stringent shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER. SHOP DRAWINGS, catalog cuts, samples, schedules, etc. shall be submitted for all materials and equipment. On initial submittals, three copies of each item shall be required. Once the review is complete and all corrections made, five copies of the final SHOP DRAWINGS shall be submitted for approval and distribution to all parties. Electronic copies of SHOP DRAWINGS is acceptable and preferred.

5.2 When submitted for the ENGINEER'S REVIEW, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked, and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES, AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools,

equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection. All equipment, including but not limited to motors, drives, gear reducers, electrical switch gear, heating, ventilation and air conditioning equipment, communication and instrumentation shall be stored in a secure, heated, ventilated and dry space. Storage must be approved by the ENGINEER. The ENGINEER'S approval of the storage plan shall not release the CONTRACTOR from responsibility for the equipment. Equipment that is not suitably stored shall not be paid for until storage requirements are met. The CONTRACTOR shall be required to comply with the manufacturers' requirements concerning lubrication, oil changes, and other special conditions during the storage period and until the equipment is installed, start-up of the equipment is instituted, and the equipment is finally accepted or determined as substantially completed.

6.3 Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

6.4 Materials, supplies, and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, supplies, or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

6.6 Materials, supplies, or equipment to be included into the WORK shall be new and unused.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS. The CONTRACTOR shall notify the OWNER of the work schedule planned in order that adequate inspection can be made. No work may be performed in any day on which it was not scheduled. A minimum of 12 hours notice of change in work schedule must be given to OWNER by CONTRACTOR. If CONTRACTOR does not work on a scheduled day, the CONTRACTOR will be charged the cost incurred by the OWNER for the lost work of the inspector.

7.3 The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness.

7.5 Inspections, tests, or approvals by the ENGINEER or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and other OWNER representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all WORK, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide facilities for such access and observation of the WORK and also for any inspection, or testing thereof.

7.7 If any WORK is covered contrary to the written instructions of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for observation and replaced at the CONTRACTOR'S expense.

7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request, will uncover, expose, or otherwise make available for observation, inspection, or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. SUBSTITUTIONS

8.1 Whenever a material, article, or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue number, it shall be understood that the first brand name listed in the SPECIFICATIONS is that around which the DRAWINGS have been prepared. Should the second or another brand name be utilized in preparing the BID, the CONTRACTOR shall be responsible for assuring that the costs of all changes, including costs of changes to the CONTRACT DOCUMENTS, required by such use are also included in the BID. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue cut, if piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra

component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

8.2 The ENGINEER and OWNER shall have final authority in reviewing and determining if any proposed substitution is an acceptable equivalent product.

9. PATENTS

9.1 The CONTRACTOR shall pay all applicable royalties and license fees. The CONTRACTOR shall defend all suits or claims for infringement of patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however, if the CONTRACTOR has reason to believe that the design, process, or product specified is an infringement of a patent, CONTRACTOR shall be responsible for such loss unless CONTRACTOR promptly gives such information to the ENGINEER.

10. SURVEYS, PERMITS, REGULATIONS

10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations, and other working points, lines, elevations, and cut sheets.

10.2 The CONTRACTOR shall carefully preserve benchmarks, reference points, and stakes; and, in case of willful or careless destruction, CONTRACTOR shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, CONTRACTOR shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13, CHANGES IN THE WORK.

11. PROTECTION OF WORK, PROPERTY, AND PERSONS

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR will take all necessary precautions for the safety of, and will protect the persons who may be affected thereby, protect all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and protect other property at the site adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction. The CONTRACTOR will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. The CONTRACTOR will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either or them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting safety of persons or the WORK or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER or OWNER, shall act to prevent threatened damage, injury, or loss. CONTRACTOR will give OWNER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

12.1 CONTRACTOR shall supervise and direct the WORK. CONTRACTOR shall be solely responsible for means, methods, techniques, sequences, and procedures of construction. CONTRACTOR shall employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by CONTRACTOR as CONTRACTOR'S representative at the site. Supervisor shall have full authority to act on behalf of CONTRACTOR and all communications given to the supervisor shall be as binding as if given to CONTRACTOR. Supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

13.1 The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME or both, in which event he shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter, the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

14.1.1 Unit prices previously approved. Under this method, it is understood that addition to or deletion of quantities of WORK in excess of 25 percent may be cause for review of the agreed unit price.

14.1.2 An agreed lump sum. For the negotiation of the agreed lump sum amount, the CONTRACTOR shall furnish the ENGINEER a breakdown of all labor, materials, supplies, and equipment utilizing the costing principles described under 14.1.3.

14.1.3 The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the WORK. In addition, there shall be added an amount to be agreed upon but not to exceed 15 percent of the actual cost of the WORK to cover the cost of general conditions, overhead and profit. To amplify the items described under 14.1.3, labor shall include the crew foreman but not supervisory, office, or administrative personnel, labor costs shall include taxes, insurance, and actual fringe benefits paid; and, rental rates for equipment owned by the CONTRACTOR shall not exceed 75 percent of Associated Equipment Distributors book rental monthly rates. To costs incurred by SUBCONTRACTORS for changes in the WORK, there shall be an added amount not to exceed 10 percent of the subcontract to cover the cost of general conditions, overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED. CONTRACT TIME to FINAL COMPLETION for this project is sixty (60) calendar days.

15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount of $200 per day for liquidated damages as specified in the BID for

each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.4.1 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather.

15.4.2 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of any emergency, notify the OWNER by WRITTEN NOTICE of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.1.2 Unknown physical conditions at the site, of unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.2 The OWNER shall promptly investigate the conditions, and if the OWNER finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified

by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE; provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

18.2 If the CONTRACTOR is adjudged a bankrupt or insolvent; or if the CONTRACTOR makes a general assignment for the benefit of CONTRACTOR'S creditors; or if a trustee or receiver is appointed for the CONTRACTOR or for any of the CONTRACTOR'S property; or if the CONTRACTOR'S files a petition to take advantage of any debtor's act; or to reorganize under the bankruptcy or applicable laws; or if the CONTRACTOR repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment; or if the CONTRACTOR repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials, or equipment; or if the CONTRACTOR disregards laws, ordinances, rules, regulations, or orders of any public body having jurisdiction of the WORK; or if the CONTRACTOR disregards the authority of the ENGINEER; or if the CONTRACTOR otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment, and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method the OWNER may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the CONTRACT. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER; or under any order of court or other public authority; or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted; or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days WRITTEN NOTICE to the OWNER and the ENGINEER stop the WORK until he has paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT shall be made to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENTS TO CONTRACTOR

19.1 At least ten (10) days before the first pay application the CONTRACTOR shall submit a Schedule of Values for approval by the ENGINEER.

19.2 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER an updated project schedule. For projects expected to exceed 90 days this shall be a cost loaded CPM schedule.

19.3 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. As approved in advance by the OWNER if payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within twenty (20) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate.

19.4 If approved in advance by the OWNER the request for payment may also include an allowance for the cost of such major materials and equipment, which are suitably stored either at or near the site.

19.5 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or SUBSTANTIALLY COMPLETED portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.6 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.7 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of the completion and acceptance of the WORK.

19.8 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so, the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR’S unpaid compensation a sum of money deemed reasonable sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his Surety, or any third party.

In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

19.9 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the PERFORMANCE BOND and PAYMENT BONDS.

21. INSURANCE

21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts; and

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees; and

21.1.3 Claims for damages because of bodily injury, sickness liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

21.1.4 Claims for damages because of bodily injury, sickness, or disease, or death of any person other than his employees; and

21.1.5 Claims for damages because of injury in or destruction of tangible property, including loss of use resulting there from.

21.2 Certificates of insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These certificates shall contain a provision that coverages afforded under the policies will not be canceled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified:

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the

CONTRACTOR or by a SUBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than $1,000,000 for all damages arising out of bodily injury, including death, at any time resulting there from, sustained by any one person in any one accident; and a limit of liability of not less than $1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $1,000,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $1,000,000 aggregate for any such damage sustained by two or more persons in any one accident.

21.3.2 The CONTRACTOR shall acquire and maintain Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and the SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

21.3.3 The CONTRACTOR shall acquire and maintain such special insurance coverage as required by the railroad crossing license/permit

21.4 The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the WORK is performed. Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require each SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous WORK under this CONTRACT at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

21.5 The CONTRACTOR shall secure “All Risk” type Builder’s Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightening, vandalism, malicious mischief, wind, flood, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

22. CONTRACT SECURITY

22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions, and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the

CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the State of Virginia and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in Virginia or is removed from the list of Surety Companies accepted on Federal BONDS, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER. The Performance Bond shall remain in full force and effect through the guarantee period.

23. ASSIGNMENTS

23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign, or otherwise dispose of the CONTRACT or any portion thereof, or of their right, title, or interest therein, or their obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that such claims, damage, loss, or expense is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property including the loss of use resulting there from; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER or ENGINEER’S employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

25. SEPARATE CONTRACTS

25.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the

introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate the CONTRACTOR'S WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

25.2 The OWNER may perform additional WORK related to the PROJECT, or OWNER may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if the CONTRACTOR is performing the additional WORK), reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate the CONTRACTOR'S WORK with theirs.

25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, WRITTEN NOTICE thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves the CONTRACTOR in additional expense or entitles the CONTRACTOR to an extension of the CONTRACT TIME, the CONTRACTOR may make a claim therefore as provided in Sections 13 and 14.

26. SUBCONTRACTING

26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty CONTRACTORS.

26.2 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of any SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as the CONTRACTOR is for the acts and omissions of persons directly employed by the CONTRACTOR.

26.3 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

26.4 Nothing contained in the CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

27.1 The ENGINEER shall act as the OWNER'S representative during the construction period. The ENGINEER shall decide questions, which may arise as to quality and acceptability of materials furnished and WORK performed. The ENGINEER shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will

make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply at the ENGINEER'S discretion.

27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHT-OF-WAYS

28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and right-of-ways necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

28.2 The OWNER shall provide to the CONTRACTOR information, which delineates and describes the lands owned and right-of-ways acquired.

28.3 The CONTRACTOR shall provide at CONTRACTOR'S own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

29.1 Unless noted otherwise in the CONTRACT DOCUMENTS the CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of FINAL ACCEPTANCE. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of FINAL ACCEPTANCE of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects.

The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The PERFORMANCE BOND shall remain in full force and effect through the guarantee period.

30. TAXES

30.1 The CONTRACTOR will pay all sales, consumer, use, and other similar taxes required by the law of the place where the WORK is performed.

31. CLEAN UP ON COMPLETION OF PROJECT

31.1 On completion of the WORK covered by any of the sections of this PROJECT, the CONTRACTOR for said section shall clean up the entire premises occupied by his operations, and this area shall be left neat and clean of trash, debris, piles of earth, waste materials or equipment. All surplus materials and equipment, trash, debris, and other foreign matter shall be disposed of as directed by the ENGINEER or OWNER. The entire project or sections thereof shall be made ready for the OWNER'S use, and the CONTRACTOR shall assist as may be necessary in placing any equipment furnished under the contract in proper operating condition.

32. WORK HOURS

32.1 Work hours shall be Monday through Friday from 7:00 am to 5:00 pm and other hours if approved in advance by the OWNER.

32.2 All work after 5:00pm Monday through Friday and on weekends must be scheduled a minimum of two business days in advance.

33. PROJECT IDENTIFICATION SIGNBOARD

Not required for this project.

34. SUPPLEMENTAL CONDITIONS

34.1 The following additions to, substitutions for, or explanation of the GENERAL CONDITIONS, if any, shall be included as part of these CONTRACT DOCUMENTS. The number utilized refer to those contained in the GENERAL CONDITIONS.

35. NONDISCRIMINATION PROVISIONS

35.1 The successful CONTRACTOR agrees not to discriminate against any employee or applicant for employment because of age, race, religion, color, sex or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provision of the nondiscrimination clause.

35.2 The CONTRACTOR, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that the Contractor is an equal opportunity employer. Notices, advertisements, and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

35.3 The CONTRACTOR will include the provision of the foregoing paragraph in every subcontract or purchase order over ten thousand dollars ($10,000.) so that the provisions will be binding upon each subcontractor or vendor.

36. IMMIGRATION AND CONTROL ACT OF 1986

36.1 CONTRACTOR is aware of and understands the Immigration Reform and Control Act of 1986 (IRCA) and is in compliance with IRCA; that it acknowledges its responsibility to complete I-9 Employment Eligibility Verification forms for all of its employees assigned to work on County contracts who are not authorized to work in the United States; and that it agrees to defend and indemnify the county for any liability arising out of claims that the contractor's employees are not authorized to work in the United States or any other claims based upon any alleged violations of IRCA by the contractor.

INVITATION TO BID #2020-026 BENT MOUNTAIN CENTER ROOF REPLACEMENT

Attachment B

Project Manual

PROJECT MANUAL FOR:

BENT MOUNTAIN CENTER RE-ROOFING & REPAIRS

10148 TINSLEY LANE
BENT MOUNTAIN, VIRGINIA
(ROANOKE COUNTY)

BALZER AND ASSOCIATES, INC
PROJECT NUMBER 03160018.00

OCTOBER 2, 2019

BALZER & ASSOCIATES

COMMONWEALTH OF VIRGINIA
ROBERT W. PILKINGTON
Lic. No. 013210
ARCHITECT

RWP
10/2/19

BALZER AND ASSOCIATES, INC.
PLANNERS•ARCHITECTS•ENGINEERS•SURVEYORS
1208 Corporate Circle•Roanoke, Virginia 24018•TEL (540) 772-9580•FAX (540) 772-8050

BENT MOUNTAIN CENTER RE-ROOFING & REPAIRS
10148 Tinsley Lane
Bent Mountain, Roanoke County, Virginia
October 2, 2019

SPECIFICATION INDEX

BENT MOUNTAIN CENTER RE-ROOFING & REPAIRS
10148 Tinsley Lane
Bent Mountain, Roanoke County, Virginia
October 2, 2019

PROJECT DIRECTORY

OWNER:

Roanoke County
General Services
1216 Kessler Mll Road
Salem, Virginia 24153
Phone: (540) 777-6345
Fax: (540) 387-6112

Contact:
Ronald Riquelmy
Facility & Capital Project Support Specialist
Email: rriquelmy@roanokecountyva.gov

TENANT:

Bent Mountain Center
10148 Tinsley Lane
Bent Mountain, Virginia (Zip)

ARCHITECT:

Balzer and Associates, Inc.
1208 Corporate Circle
Roanoke, Virginia 24018
Phone: (540) 772-9580
Fax: (540) 772-8050

Contact:
Robert Pilkington, Architect
Email: rpilkington@balzer.cc
Cell Phone: (540) 641-0896

BENT MOUNTAIN CENTER RE-ROOFING & REPAIRS
10148 Tinsley Lane
Bent Mountain, Roanoke County, Virginia
October 2, 2019

DRAWING & DOCUMENT INDEX

1. **DRAWINGS:**

T1.1	Cover & Project Information
D1.1	Roof Demolition Plan
A1.0	Structural Roof Decking Replacement Plan
A1.1	Renovation Roof Plan
A1.2	Roof Details

2. **SPECIFICATIONS:** Project Manual for:
Bent Mountain Community Center- Re-roofing & Repairs
Divisions 1-9
Balzer and Associates, Inc.
October 2, 2019

3. **ASBESTOS SURVEY:** "Limited Asbestos Roofing Survey Report"
Prepared by Froehling & Robertson
F&R Project # 62X-0281
Issue Date: 07/30/2019
(note: Included at end of Project Manual)

4. **LEAD PAINT SURVEY:** (Note: this report is part of a larger report that includes asbestos testing on the building interior)
"Limited Asbestos Survey and Lead-Based Paint Inspection Report"
Prepared by Froehling & Robertson
F&R Project # 62X-0328
Issue Date: 08/26/2019
(note: Included at end of Project Manual)

BENT MOUNTAIN CENTER RE-ROOFING & REPAIRS
10148 Tinsley Lane
Bent Mountain, Roanoke County, Virginia
October 2, 2019

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011000 - SUMMARY

A. Work Covered by the Contract Documents:

1. Project Identification: Project consists of a roof replacement of approximately 7,545 s.f. of membrane roof on an existing building, along with minor slate roofing repairs.

   a. Project Location: 10148 Tinsley Lane, Bent Mountain, Roanoke County, Virginia.
   b. Owner: Roanoke County
   c. Owner's Representative: Ronald Riquelmy
      Facility & Capital Project Support Specialist
      County of Roanoke
      1216 Kessler Mill Road
      Salem, Virginia 24153
      Phone: 540-777-6345

2. Architect Identification: Balzer and Associates, Inc., 1208 Corporate Circle, Roanoke, Virginia, 24018.

3. The Work consists of the removal and replacement of the existing built-up roofing over an area of approximately 7,545 s.f. of the existing building. The Work includes the removal of any/all existing roof ballasts, built-up roofing membrane and insulation (including removal of asbestos-containing materials and possibly lead-based paint in affected roof demolition areas); removing existing roof accessories, cap flashing, etc.; if required, the removal and storage of existing roof-mounted fans and HVAC units; installation of new TPO fully-adhered membrane roofing and insulation; re-installation of any existing roof-mounted fans and HVAC units if removed during demolition; and re-installation of any existing accessories, etc. The Work also includes some minor slate roofing repairs and the installation of a new roof-access ladder. The Work includes all labor and materials necessary to perform the building construction indicated in the Drawings and Specifications. Contractor shall base his bid on the supplied information, and shall also include any additional details, equipment, systems or materials not necessarily shown, but implied, in order to deliver a complete and finished product to the Owner.

4. Contract Summary: The General Construction Contract shall include all work required to complete the Project, including all required permits and inspections by the local Building Official; all work as detailed in the Construction Documents; all required design and installation of any mechanical, electrical and plumbing components as indicated in Drawings and as required to obtain necessary permits and complete the project; temporary facilities and controls as required by the Contractor; and any additional requirements the Contractor may need in order to deliver a complete building to the Owner at the Project conclusion. Omissions from the Contract shall include the following: costs for coordination and payment for required independent special inspections; or work outlined herein under other contracts.

B. Contract: Single general construction contract; the County of Roanoke utilizes a specific Construction Contract and General Conditions developed specifically by and for projects constructed by independent contractors within and for the County, referenced in the County's Request for Proposal (RFP) for this project. A draft copy of the standard contract and conditions will be provided as an Addendum prior to the Bid Due Date.

C. Use of Premises & Work Sequence: Contractor shall have full use of limits of building exterior site construction for construction operations, allowing Owner to continue full use of the existing building interior. Contractor shall be required to contain ongoing work in such ways as to keep the Owner's continuing use of existing facilities. The onsite parking lot shall not be used by the Contractor or their sub-contractors for parking, building access or staging of materials.

D. Work Under Other Contracts: Owner may award a separate contract for performance of certain work outside the scope of this project; any work outside the scope of this project is indicated as "N.I.C." (not in contract) in Construction Documents.

E. See Drawings for additional project notes not necessarily included in Project Manual.

F. All roof access shall be from exterior of building, see general construction notes in Drawings.

G. Contractor shall be responsible for all means, methods, processes and scheduling for maintaining a dry building interior throughout re-roofing processes.

SECTION 012200 - UNIT PRICES

Contractor shall include with the Contract a list of unit prices for materials or services to be added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased. Unit prices shall be included for the following:

- Hauling ($/ton/mile)
- Curb Replacement for exhaust fans, etc. ($/per typical replacement)
- Cap Flashing Replacement ($/per linear foot) (Note: for any additional beyond that shown to be replaced in the Drawings)
- Parapet Blocking ($/per 12'-0" section, including bolting)
- Roof Drain Replacement ($/per roof drain) (Note: for any additional beyond that shown to be replaced in the Drawings)
- Roof Drain Supports ($/per roof drain location) (Note: for any additional beyond that shown to be replaced in the Drawings)
- Thru-Wall Scupper Replacement ($/per typical replacement)
- Roof decking replacement ($/per square foot of roof area)

- Roof structure rafter replacement ("sistered" to existing rafters) ($/per linear foot)

SECTION 12300 - ALTERNATES

Contractor shall supply to the Owner, with the contract, a written list of materials that were included in the Bid as an alternate. Such alternates shall be of similar quality or grade as that specified or indicated in the Drawings and Specifications or shall be submitted with a written explanation for the substitution. Any substitution submitted with Bid shall include cut-sheets for the proposed alternate, for review by the Owner and/or Architect.

SECTION 012600 - CONTRACT MODIFICATIONS

Contractor-initiated proposals which involve modifications to the Contract Sum or Contract Time shall be submitted on AIA Document G709. Modifications to the Contract Sum or Contract Time shall be submitted on AIA Document G701 (standard change order form). General Contractor, Owner's designated representative and Architect shall all sign form before any change order shall be billed for.

SECTION 012900 - PAYMENT PROCEDURES

Payment

Applications for Payment shall be submitted to the Owner (and/or Architect if chosen by Owner) on AIA Document G702 "Application and Certification for Payment". Payment application times for each progress payment shall be included in the Agreement between Owner and Contractor. Each Application for Payment shall include a Schedule of Values for all Work completed to date, including a line item for each Specification Section, and shall be submitted on AIA Document G703 "Continuation Sheet to Application for Payment". The Schedule of Values shall be updated with each pay request to reflect approved Change Orders. After the project has reached Substantial Completion, Contractor shall submit an Application for Payment showing 100 percent completion (minus retainage) for portion of the Work claimed as substantially complete. After all work required by the Agreement between Owner and Contractor has been completed, Contractor shall submit a final Application for Payment for full payment of the Contract Sum.

Retainage

Five (5)% of completed work, with full release on completion of punch list repairs.

Change Orders

The combined overhead and profit included in the total cost to the Owner of a change in the Work shall be based on the following schedule:

1. For the Contractor, for Work performed by the Contractor's own forces, **15%.**
2. For the Contractor, for Work performed by the Contractor's Subcontractors, **10%.**
3. For each Subcontractor involved, for Work performed by that Subcontractor's own forces, **15%.**

4. For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, **no markup.**
5. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over $500.00 be approved without such itemization.
6. Change orders with any markup for services performed by either the General Contractor or their subcontractors shall only be for work or items which were not expressed or intended by the Construction Drawings, specifically requested by the Owner, or due to unforeseen circumstances. Change orders for work due to omissions or negligence by the General Contractor or any sub-contractor shall have no markup for cost of services.

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

A. All Project Management and Coordination required for the Work to be completed within the Contract Time and Contract Sum shall be the responsibility of the General Contractor. Coordination shall include all operations necessary for the efficient and orderly installation of each part of the Work. General Contractor shall provide a full-time on-site Job Superintendent to ensure coordination between all trades and disciplines, as well as any other supervision as the Contractor requires.

B. Contractor shall be responsible for all means, methods, processes and scheduling of Work for maintaining a completely dry building interior throughout re-roofing processes. Contractor shall include in writing with Bid any scheduling concerns regarding how to schedule the Work to maintain the dry building interior.

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

The General Contractor shall prepare a written Schedule of Construction (bar chart), showing the order of construction for each part of the Work indicating critical path items, and shall arrange necessary meetings with the Owner for on-site review of construction progress. The schedule shall be updated as required by Change Orders, down time due to weather, or other occurrences which would have an affect on the overall Contract Time or Construction Phasing.

Project Meetings

Contractor shall establish and schedule regular job-site meetings, frequency of meetings to be established between Owner and Contractor prior to construction. Job site meetings are to be attended by General Contractor’s onsite Job Superintendent and/or Project Manager, Owner’s representative, and Architect (if chosen to by Owner). General Contractor shall notify all parties of changes in scheduled meetings at least one day in advance.

Request For Interpretation (RFI’S)

Immediately upon discovery of the need for interpretation of the Contract Documents, Contractor shall prepare written RFI's to be submitted to Owner and/or Architect for review. All RFI's shall originate from the General Contractor. All RFI's shall include a full written description of item needing interpretation, including references to drawing sheet names and details titles as appropriate. Owner and/or Architect shall be allowed 7 working days for initial response.

SECTION 013300 - SUBMITTALS

Contractor shall submit to the Architect for approval submittals for all proposed construction as noted in the Specifications, and for materials which vary from those specified or indicated in the Specifications or Drawings. Include samples which show the full range of color and texture for any Interior or Exterior proposed finish. Materials listed as "Basis-of-Design" products shall establish the desired minimum requirements for grade and quality.

Contractor shall allow at least 14 calendar days for initial review of each submittal, and shall provide at least 3 copies of submittals for approval (or provided in digital form). All submittals shall be previously reviewed and approved by General Contractor prior to submittal to the Architect and/or Owner.

Substitutions for any item proposed to be substituted for items specifically specified in either the Drawings or Specifications shall be submitted with a written explanation for the substitution, and shall include cut-sheets for the proposed alternate, for review by the Owner and/or Architect. Contractor shall allow at least 7 days for review of substitutions for appropriateness for the particular application in addition to normal review time for submittals.

SECTION 014000 - QUALITY ASSURANCE

General

All work shall be performed by reputable firms with at least (3) years experience in the type of work they will be performing. Contractor shall submit, at Owner's request, a list of projects that proposed sub-contractors have completed in the past, with references for previous clients, showing work completed of similar nature to the proposed Work. All work installed that is not judged to be of acceptable quality or workmanship by Owner or Architect shall be removed and replaced at Contractor's expense.

Inspections

All Work shall be inspected by local building officials as required under the Building Permit.

Building Code Requirements

All construction shall meet the minimum requirements set forth in the 2015 Virginia Construction Code (VCC), the 2015 Virginia Existing Building Code and the various other Virginia Codes by reference.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

The General Contractor shall provide all temporary utilities and support facilities necessary to complete the Work, including, but not limited to, the following: temporary electrical; temporary toilets and sewer service; temporary lighting; temporary telephone service; temporary roads and paving; temporary stairs, lifts or hoists; security and protection facilities such as enclosure fences, barricades, temporary partitions, or plant and tree protection; temporary structural shoring elements; temporary scaffolding; or other temporary facilities as needed by General Contractor and sub-contractors to complete the Work. All required fees for temporary services shall be included in the Contract. All temporary services shall be removed from site at Contractor's expense at the completion of the Work. General Contractor shall provide temporary toilet services for all construction personnel; use of Owners existing restroom facilities is strictly prohibited. Provide any necessary temporary construction required to maintain owner/patron exits from existing building and site during construction. Provide any necessary temporary construction required to maintain separation between occupied building areas and work areas.

SECTION 017300 - EXECUTION REQUIREMENTS

Procedural requirements for execution of the Work shall include, but are not limited to, the following:

A. Examination: Contractor shall be responsible for completely examining all existing conditions. The existence and location of all material and construction elements shown as "existing" in Drawings is not guaranteed. During demolition procedures Contractor shall verify existing conditions with new work plans and notify Architect immediately of any discrepancies. No structural elements shall be removed, cut or modified until all existing structural conditions have been verified. Failure to report inconsistencies will relieve Architect and Owner from any claim for additional work related to the inconsistency. Contractor shall also examine all substrates, areas and conditions with installers or applicators to insure compliance of construction tolerances, adherence, installation requirements and other conditions affecting performance.

B. Preparation: Contractor shall be responsible for the following: coordination with local utilities regarding connection, relocation and/or disruption of services; field measurements as required to fit the Work properly; verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Construction Layout & Installation: Contractor shall be responsible for all construction means, methods, techniques, sequences and procedures and for safety precautions and programs as they relate to the Work, to include permitting and erection of all temporary scaffolding, hoists, bracing, form work, sheeting, shoring and underpinning as necessary to perform the Work.

D. Progress Cleaning: Clean Project site and work areas daily, including common areas. Maintain Project site free of waste materials and debris. Dispose of construction waste regularly (compliant with Construction Waste Management section above). Only one construction waste container will be allowed outside of the building, Contractor to coordinate with Owner on location, to be located completely clear of any existing road and parking areas.

E. Protection of Installed Work: Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion. Maintain manufacturer's requirements for temperature and humidity for all installed Work.

F. Hazardous Materials: Any hazardous materials, including asbestos-containing materials (ACM's) and lead-based paint, that are disturbed or removed during construction processes shall be properly handled and disposed of as required by all Federal, State and local codes. See surveys for ACM's and lead-based paint include at the end of the Project Manual as follows:

1. ASBESTOS SURVEY:
   "Limited Asbestos Roofing Survey Report"
   Prepared by Froehling & Robertson
   F&R Project # 62X-0281
   Issue Date: 07/30/2019
   This report covers all ACM's that may be disturbed or require removal during re-roofing processes above the roof deck. Disturbance of any ACM's on the building interior is not anticipated as part of the Work, as all re-roofing work is anticipated to be above the roof deck.

2. LEAD-BASED PAINT SURVEY:
   "Limited Asbestos Survey and Lead-Based Paint Inspection Report"
   Prepared by Froehling & Robertson
   F&R Project # 62X-0328
   Issue Date: 08/26/2019
   This report is a combination ACM and lead-based paint survey for the building. The ACM survey in this report covers ACM's on the building interior and is not anticipated to be part of any Work for the roof replacement. This report does include lead-based paint, including lead-based paint that may be encountered/disturbed during the re-roofing/roof replacement Work. Specifically, the applicable sections of this report for lead-based paint are Sections 4.0 through 4.5.2 (pages 23 through 28 of the referenced report) and Appendix F, specifically sample reading numbers 48, 49, 177, 178, 246, 251 and 257. These samples were taken at locations of windows and exterior fascia/trim that may be disturbed during re-roofing processes and slate roof repairs.

SECTION 017700 - CLOSEOUT PROCEDURES

At completion of the Work, General Contractor shall submit the following documentation prior to submitting a final Application for Payment:

1. Prepare a written list of items to be completed and corrected (punch list), the value of the items on the list, and reasons why the work is not complete.
2. Submit documentation of releases permitting the Owner unrestricted use of the Work and access to services and utilities, if required.
3. Documentation that all touch-up and repair work has been completed.
4. Make final changeover and deliver any keys (if necessary) to Owner.
5. Complete all final cleaning. Clean all areas of site disturbed by construction practices; touch-up and clean all exterior and interior finishes disturbed by or included in the Work; remove all

excess construction debris from site; clean plumbing fixtures to a sanitary condition; and any additional cleaning required to make all installed Work clean and ready for occupancy.

6. Submit all warranties and maintenance data to Owner. Arrange final meeting with Owner's representative(s) for instruction/training and review regarding all warranties and maintenance requirements.
7. Provide at least one record set of drawings with markups documenting changes in Work during construction practices.

After required documentation is submitted, the Owner and/or Architect will make a final inspection to determine that all requirements of the Contract have been met. After inspection, Architect and/or Owner will approve the final Certificate for Payment, or will notify the Contractor of any construction that must be completed or corrected before the certificate will be issued.

END OF DIVISION 1

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Salvage of existing items to be reused or recycled.
3. Demolition and removal of selected asbestos containing materials (ACM's)

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property and for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Coordination of Owner's continuing occupancy of the existing building interior.

C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

1.4 FIELD CONDITIONS

A. Owner will occupy existing building interior immediately adjacent to (under) selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

E. Quantities: Contractor shall be responsible for verifying quantities of all materials to be demolished and removed from site, including stone ballasts, built-up roofing and/or roofing membrane, insulation and any/all accessories. Material quantities shall be factored into Contractor's base bid.

F. Hazardous Materials: Contractor shall be responsible for all required field preparations, safeguards, temporary enclosures, etc. for removal of any asbestos containing materials (ACM's) or disturbance/removal of any lead-based paint necessitated by roof replacement processes. See ACM and lead-based paint survey reports noted for Project.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

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

E. Survey of Existing Conditions: Record existing conditions by use of measured drawings and/or preconstruction photographs.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Store items in a secure area until delivery to Owner.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Protect items from damage during transport and storage.
3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

E. Hazardous Materials: Properly remove any asbestos containing materials (ACM's) or lead-based paint as required by all Federal, state and local codes.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Division 07 for new roofing requirements.

1. Remove and store existing roof copings and other roof accessories as noted in Drawings for future re-installation.

2. Remove existing roof membrane and flashings.
3. Remove existing roofing system down to substrate.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.

B. Hazardous materials: Properly dispose of any asbestos containing materials (ACM's) or lead-based paint materials as required by all Federal, state and local codes.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 040120 - MAINTENANCE OF UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes maintenance of unit masonry consisting of brick clay masonry restoration and cleaning as follows:

1. Repairing unit masonry (after building re-roofing and other construction processes)
2. Cleaning exposed unit masonry surfaces.

B. Masonry repair/maintenance work shall apply only to areas where masonry must be patch/repaired or cleaned due to damage or soiling caused during re-roofing processes or other construction processes due to work noted in Drawings.

1.2 QUALITY ASSURANCE

A. Restoration Qualifications: Engage an experienced masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.

PART 2 - PRODUCTS

2.1 MANUFACTURED REPAIR MATERIALS

A. Masonry Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching masonry.

1. Use formulation that is vapor- and water permeable (equal to or more than the masonry unit), exhibits low shrinkage, has lower modulus of elasticity than the masonry units being repaired, and develops high bond strength to all types of masonry.
2. Formulate patching compound used for patching brick in colors and textures to match each masonry unit being patched.

2.2 CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).

C. Job-Mixed Detergent Solution: Solution prepared by mixing 2 cups (0.5 L) of tetrasodium polyphosphate, 1/2 cup (125 mL) of laundry detergent, and 20 quarts (20 L) of hot water for every 5 gal. (20 L) of solution required.

D. Nonacidic Liquid Cleaner: Manufacturer's standard mildly alkaline liquid cleaner formulated for removing mold, mildew, and other organic soiling from ordinary building materials, including polished stone, brick, aluminum, plastics, and wood.

PART 3 - EXECUTION

3.1 GENERAL

A. All masonry affected, soiled or damaged by re-roofing or other construction processes shall be thoroughly repaired and cleaned after construction processes. This building is considered “Historic” and therefore any masonry repair or cleaning shall be undertaken in accordance with the National Parks Service’s historic masonry repair and maintenance guidelines.

3.2 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.

B. Comply with chemical-cleaner manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical-cleaning solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

3.3 MASONRY UNIT PATCHING

A. Patching Bricks:

1. Remove loose material from masonry surface. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on area to be patched and will be at least 1/4 inch (6 mm) thick, but not less than recommended by patching compound manufacturer.
2. Mask adjacent mortar joint or rake out for repointing if patch will extend to edge of masonry unit.
3. Rinse surface to be patched and leave damp, but without standing water.
4. Brush-coat surfaces with slurry coat of patching compound according to manufacturer's written instructions.
5. Place patching compound in layers as recommended by patching compound manufacturer, but not less than 1/4 inch (6 mm) or more than 2 inches (50 mm) thick. Roughen surface of each layer to provide a key for next layer.
6. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the masonry unit. Shape and finish surface before or after curing, as determined by testing, to best match existing masonry unit.
7. Keep each layer damp for 72 hours or until patching compound has set.

3.4 CLEANING MASONRY

A. Proceed with cleaning in an orderly manner. Ensure that dirty residues and rinse water will not wash over cleaned, dry surfaces.

B. Use only those cleaning methods indicated for each masonry material and location.

1. Do not use wire brushes or brushes that are not resistant to chemical cleaner being used. Do not use plastic-bristle brushes if natural-fiber brushes will resist chemical cleaner being used.
2. Use spray equipment that provides controlled application at volume and pressure indicated, measured at spray tip. Adjust pressure and volume to ensure that cleaning methods do not damage masonryRetain first subparagraph below unless spray application of chemical cleaners is not acceptable. Wind drift of chemical cleaners is often a problem with spray application.
3. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
4. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F (60 and 71 deg C) at flow rates indicated.

C. Perform each cleaning method indicated in a manner that results in uniform coverage of all surfaces, including corners, moldings, and interstices, and that produces an even effect without streaking or damaging masonry surfaces.

D. Water-Spray Application Method: Unless otherwise indicated, hold spray nozzle at least 6 inches (150 mm) from surface of masonry and apply water in horizontal back and forth sweeping motion, overlapping previous strokes to produce uniform coverage.

E. Detergent Cleaning:

1. Wet masonry with hot water applied by low-pressure spray.
2. Scrub masonry with detergent solution using medium-soft brushes until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from mortar joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that masonry surface remains wet.
3. Rinse with [water applied by medium-pressure spray to remove detergent solution and soil.

F. Nonacidic Liquid Chemical Cleaning:

1. Wet masonry with hot water applied by low-pressure spray.
2. Apply cleaner to masonry by brush or low-pressure spray.
3. Rinse with water applied by medium pressure spray to remove chemicals and soil.

G. After any replacement mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.

END OF SECTION 040120

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:
   1. Steel ladders.
   2. Miscellaneous metal trim.
   3. Miscellaneous metal framing.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Welding certificates.

1.3 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1, “Structural Welding Code—Steel”, and AWS D1.3, “Structural Welding Code—Sheet Steel”.

PART 2 - PRODUCTS

2.1 MATERIALS-GENERAL

A. General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

2.2 METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304.

C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

D. Rolled Steel Floor Plate: ASTM A 786/A 786M.

E. Steel Tubing: ASTM A 500.

F. Steel Pipe: ASTM A 53, standard weight (Schedule 40), black finish.

G. Slotted Channel Framing: Cold-formed metal channels with flange edges returned toward web and with 9/16-inch- (14.3-mm-) wide slotted holes in webs at 2 inches (51 mm) o.c

H. Cast Iron: ASTM A 48/A 48M or ASTM A 47/A 47M.

I. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

J. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.

K. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

L. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

M. Fasteners:
1. General: Provide Type 304 or 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, and class required.
2. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325-N.
3. Anchor Bolts: ASTM F1554 with S1 supplement, Grade 50.
4. Machine Screws: ASME B18.6.3.
5. Lag Bolts: ASME B18.2.1.
6. Wood Screws: Flat head, carbon steel.
7. Plain Washers: Round, carbon steel, ASME B18.22.1.
8. Lock Washers: Helical, spring type, carbon steel, ASME B18.21.1.
9. Expansion Anchors: Zinc-plated carbon steel anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
10. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as needed.

2.3 FABRICATION

A. General: Shear and punch metals cleanly and accurately. Remove burrs and ease exposed edges. Form bent-metal corners to smallest radius possible without impairing work.

B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

C. Fabricate metal fabrications to allow for movement resulting from the following changes: 120° F (67° C), ambient; 180° F (100° C), material surfaces.

D. Welding: Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. At exposed connections, finish welds and surfaces smooth with contour of welded surface matching those adjacent; remove excess flux immediately.

E. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

F. Provide galvanized steel for all loose steel lintels, loose bearing and leveling plates, shelf angles, and all exterior steel members subject to the elements.

G. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

H. On units indicated to be cast into concrete or built into masonry, provide welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c.

I. Apply shop primer to prepared surfaces of metal fabrications, unless indicated otherwise. Comply with NAAMM for applying finishes. See Division 9, Section “Painting” for primer requirements for metal surfaces to be field-painted as indicated in drawings.

J. Prepare uncoated ferrous metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning," and paint with a fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

E. Field welding shall comply with same requirements for shop welding previously stated in this section.

F. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

G. Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

H. Field paint metal fabrications exposed to view, as indicated in drawings; comply with all requirements under Division 9, Section “Painting.

END OF SECTION 05 50 00

SECTION 061053 – MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Rooftop equipment bases and support curbs.
2. Wood blocking, cants and nailers.
3. Rough framing replacement.
4. Roof decking replacement.

1.2 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

D. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

E. Nominal Sizes: As indicated in Drawings.

2.2 PRESERVATIVE TREATED MATERIALS

A. Preservative-Treated Materials: AWPA C2, except that lumber not in ground contact and not exposed to the weather may be treated according to AWPA C31 with inorganic boron (SBX).

1. Use treatment containing no arsenic or chromium.
2. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent.
3. Mark lumber with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

B. Provide preservative-treated wood materials for items indicated on Drawings, and the following:

1. Solid wood framing members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Concealed members in contact with masonry or concrete.
3. Wood framing members that are less than 6 inches (460 mm) above the ground.
4. Wood floor plates that are installed over concrete slabs-on-grade.

C. Fire-Retardant-Treated Materials: Comply with performance requirements in AWPA C20. Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics as determined by testing identical products per test method indicated by a qualified testing agency. Provide products with a flame spread index of 25 or less when tested according to ASTM E 84.

1. Provide fire-retardant-treated wood materials for items indicated on Drawings.
2. Use treatment that does not promote corrosion of metal fasteners.

2.3 LUMBER

A. Concealed Boards: Mixed southern pine or Spruce-pine-fir with 15 percent maximum moisture content.

B. Miscellaneous Lumber: Construction, or No. 2 grade with 15 percent maximum moisture content of any species. Provide for nailers, blocking, and similar members.

C. Rough Framing Replacement: Southern Yellow Pine No. 2 with 15 percent maximum moisture content.

D. Roof Decking Replacement: Exterior grade sheathing, Exposure 1, 24/16 span rating, thickness to match existing roof decking.

2.4 MISCELLANEOUS PRODUCTS

A. Fasteners: Size and type indicated. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

1. Power-Driven Fasteners: CABO NER-272.
2. Nails, Brads, and Staples: ASTM F 1667.
3. Wood Screws: ASME B18.6.1.
4. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
5. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
6. Expansion Anchors: Stainless steel anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

B. Metal Framing Anchors: Structural capacity, type, and size indicated.

1. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
2. Use anchors made from hot-dip galvanized steel complying with ASTM A 653/A 653M, G60 (Z180) coating designation for interior locations where stainless steel is not indicated.
3. Use anchors made from stainless steel complying with ASTM A 666, Type 304 for exterior locations and where indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

D. Securely attach rough carpentry and sheathing to substrates, complying with the following:

1. CABO NER-272 for power-driven fasteners.
2. Published requirements of metal framing anchor manufacturer.
3. Table 2304.9.1, "Fastening Schedule," in the 2015 VCC.

E. Use steel common nails or screws unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Fasteners used in preservative treated wood shall be galvanized as noted in 2.4A above. Make tight connections between members. Install fasteners without splitting wood. Drive nails or screws snug but do not countersink nail or screws heads unless otherwise indicated.

END OF SECTION 061053

SECTION 070150.19 - PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Membrane roofing roof tear-off.
2. Temporary roofing membrane.
3. Roof re-cover preparation.
4. Removal of base flashings.
5. Removal of asbestos-containing materials (ACM’s)

1.2 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary in NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Existing Membrane Roofing System: EPDM roofing membrane, roof insulation, surfacing, and components and accessories between deck and roofing membrane.

C. Roof Re-Cover Preparation: Existing roofing membrane that is to remain and be prepared for reuse.

D. Roof Tear-Off: Removal of existing membrane roofing system from deck.

E. Partial Roof Tear-Off: Removal of a portion of existing membrane roofing system from deck or removal of selected components and accessories from existing membrane roofing system.

F. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and reinstalled.

G. Existing to Remain: Existing items of construction that are not indicated to be removed.

H. ACM’s: Materials containing asbestos.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Temporary Roofing: Include Product Data and description of temporary roofing system if proposed as part of re-roofing project.

C. Landfill Records: Indicate receipt and acceptance of hazardous wastes, such as asbestos-containing material, by a landfill facility licensed to accept hazardous wastes.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning membrane roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Reroofing Conference: Conduct conference at Project site to review with Owner and Architect all methods and procedures for removing existing roofing, protection of building interior/envelope during construction processes, and installation of new roofing.

1.5 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations will not be disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.

E. Limit construction loads on roof to 20 psf for uniformly distributed loads and equivalent rooftop equipment wheel loads.

F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

G. Hazardous Materials: **Contractor shall be responsible for all required field preparations, safeguards, temporary enclosures, etc. for removal of any asbestos containing materials (ACM's) or lead based paint necessitated by roof replacement processes. See ACM and lead-based paint survey reports noted for Project.**

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing system warranty.

PART 2 - PRODUCTS

2.1 TEMPORARY ROOFING MATERIALS

A. Design and selection of materials for temporary roofing are responsibilities of Contractor, utilizing materials that meet all national, state and local codes.

2.2 AUXILIARY REROOFING MATERIALS

A. General: Auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of new membrane roofing system.

B. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Approval's "Approval Guide."

C. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect existing roofing areas that are indicated not to be reroofed (including existing metal roof areas).

B. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding.

E. Verify that rooftop utilities and service piping have been shut off before beginning the Work.

3.2 ROOF TEAR-OFF

A. General: Notify Owner each day of extent of roof tear-off proposed for that day.

B. Remove aggregate ballast from roofing membrane.

C. Remove pavers and accessories from roofing membrane.

D. Remove protection mat and extruded-polystyrene insulation from protected roofing membrane.

E. Roof Tear-Off: Remove existing roofing membrane and other membrane roofing system components down to the deck. Remove fasteners from deck or cut fasteners off slightly above deck.

F. ACM's: Properly remove any asbestos containing materials (ACM's) as required by all Federal, state and local codes.

3.3 DECK PREPARATION

A. Inspect deck after tear-off of membrane roofing system.

B. Verify that substrate is visibly dry and free of moisture. Do not proceed with roofing work until any moisture is removed.

C. If broken or loose fasteners that secure deck panels to one another or to structure are observed or if deck appears or feels inadequately attached, immediately notify Architect. Do not proceed with installation until directed by Architect.

D. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

3.4 TEMPORARY ROOFING MEMBRANE

A. Install approved temporary roofing membrane over area to be reroofed.

B. Remove temporary roofing membrane before installing new roofing membrane.

3.5 EXISTING BASE FLASHINGS

A. Remove existing base flashings around parapets, curbs, walls, and penetrations.

B. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish, or as specified in Division 07 Section "Sheet Metal Flashing and Trim."

C. Inspect back of parapet CMU. If parapet CMU has deteriorated, immediately notify Architect.

3.6 DISPOSAL

A. Promptly dispose of demolished materials, unless noted otherwise in Drawings to be salvaged or re-used. Do not allow demolished materials to accumulate on-site.

B. Hazardous Materials: Properly dispose of any asbestos containing materials (ACM's) or lead-based paint materials as required by all Federal, state and local codes.

END OF SECTION 070150.19

SECTION 073126 - SLATE SHINGLE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes slate shingle roofing and accessories specific for selective replacement for existing slate shingles.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For the following products:

1. Slate shingle roofing, of color and sizes specified.
2. Slate shingle accessories.

C. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of slate shingles.

E. Warranties: Sample of special warranties.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain components including slate shingles and accessories for slate roofing system from same manufacturer or approved by roofing manufacturer.

C. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Installed slate shingles shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective

manufacture, fabrication, installation, or other defects in construction. Slate shingle roofing and base flashings shall remain watertight.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of slate roofing roofing system that fail in materials or workmanship within **20 years** from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section.

PART 2 - PRODUCTS

2.1 SLATE SHINGLES

A. Slate Shingles: ASTM C 406, Grade S1chamfered edges, with nail holes machine punched or drilled and countersunk. Size, thickness, color and texture shall match as closely as possible to existing slate shingles.

2.2 ACCESSORIES

A. Felt Underlayment: ASTM D 226, Type II, asphalt-saturated organic felt, unperforated.

B. Self-Adhering Sheet Underlayment: ASTM D 1970, SBS-modified asphalt; mineral-granule or slip-resisting-polyethylene surfaced; with release paper backing; cold applied.

C. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

D. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied.

E. Slating Nails: Copper, aluminum-alloy, or stainless-steel wire nails; 0.135-inch (3.4-mm) minimum thickness; with 3/8-inch- (10-mm-) minimum diameter flat head; of sufficient length to penetrate a minimum of 3/4 inch (19 mm) into sheathing.

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

F. Sheet Metal Flashing and Trim: Comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Only where slate shingles are being replaced, apply self-adhering sheet underlayment at eaves and rakes from edges of roof to at least **24 inches (600 mm)** inside exterior wall line. Tie back into existing underlayment.

C. Only where slate shingles are being replaced, apply self-adhering sheet underlayment at valleys extending 18 inches (450 mm) on each side.

D. Install metal flashings and other sheet metal to comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."

E. Only where slate shingles are being replaced, install first and succeeding shingle courses with chamfered face up. Install full-width first course at rake edge.

1. Offset joints of uniform-width slate shingles by half the shingle width in succeeding courses.
2. Offset joints of random-width slate shingles a minimum of 3 inches (75 mm) in succeeding courses.

F. Maintain a minimum head lap to match existing shingles between succeeding shingle courses.

G. Install and anchor slate ridges and hips in saddle configuration and lay in a bed of asphalt roofing cement.

3.2 CLEANUP & DISPOSAL

A. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Remove unused construction materials after completion of Work.

END OF SECTION 073126

SECTION 075423 - THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes adhered TPO membrane roofing system and accessories.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Verification: For the following products:

1. Sheet roofing, of color specified, including T-shaped side and end lap seam.
2. Roof insulation.
3. Metal termination bars.

D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.

F. Research/Evaluation Reports: For components of membrane roofing system, from the ICC-ES.

G. Warranties: Sample of special warranties.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is FM Approvals approved for membrane roofing system identical to that used for this Project.

B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

C. Source Limitations: Obtain components including roof insulation and fasteners for membrane roofing system from same manufacturer as membrane roofing or approved by membrane roofing manufacturer.

D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.

B. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7.

C. Energy Performance: Provide roofing system with initial Solar Reflectance Index not less than 50 percent when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within **20 years** from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section, including all components of membrane roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, within two years of Substantial Completion.

PART 2 - PRODUCTS

2.1 ROOFING MATERIALS

A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D 6878, internally fabric or scrim reinforced, uniform, flexible, fabric backed TPO sheet.

1. Subject to compliance with Project requirements, use one of the following products:

    a. Carlisle Syn Tec, Inc. “Sure-Weld TPO Fleeceback”, 115 mils.
    b. Firestone Building Products Company “UltraPly TPO XR 115”, 115 mils.

2. Thickness: 60 mils (1.5 mm) for base membrane thickness; 115 mils (2.9 mm) total thickness with fleece backing.
3. Exposed Color: White.

4. Solar Reflectance Index: 50 percent minimum.
5. Attachment: **Fully adhered.**

B. Auxiliary Materials: Recommended by roofing system manufacturer for intended use and as follows:

1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
2. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content:

    a. Plastic Foam Adhesives: 50 g/L.
    b. Multipurpose Construction Adhesives: 70 g/L.
    c. Fiberglass Adhesives: 80 g/L.
    d. Contact Adhesive: 80 g/L.
    e. Single-Ply Roof Membrane Sealants: 450 g/L.
    f. Sealant Primers for Nonporous Substrates: 250 g/L.
    g. Sealant Primers for Porous Substrates: 775 g/L.
3. Sheet Flashing: 60-mil (1.5-mm) thick TPO, same color as sheet membrane.
4. Bonding Adhesive: Manufacturer's standard.
5. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
6. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

C. Substrate Board: Provide only if required to fasten new roofing membrane and/or insulation to existing wood roof decking. ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch (13 mm) thick. Use factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate board to roof deck.

D. Vapor Retarder: Polyethylene film, ASTM D 4397, 6 mils (0.15 mm) thick, minimum, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).

2.2 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by TPO membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Approvals-approved roof insulation.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces, providing a minimum of R-5.5 per 1” thickness.

C. Fabricate tapered insulation with slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.

D. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

E. Modified Asphaltic Insulation Adhesive: Insulation manufacturer's recommended modified asphalt, asbestos-free, cold-applied adhesive formulated to attach roof insulation to substrate or to another insulation layer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install substrate board with long joints continuous and perpendicular to roof slopes with end joints staggered. Tightly butt substrate boards together and fasten to steel deck.

B. Polyethylene Film: Loosely lay polyethylene-film vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches (50 mm) and 6 inches (150 mm), respectively.

C. Insulation Installation:

1. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
2. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
3. Install tapered insulation under area of roofing to conform to slopes indicated.
4. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
5. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
6. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.

D. Adhered Membrane Roofing Installation:

1. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
2. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
3. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer and allow to partially dry before installing membrane roofing. Do not apply to splice area of membrane roofing.
4. Apply membrane roofing with side laps shingled with slope of roof deck where possible.

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

E. Base Flashing Installation:

1. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
2. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
3. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
4. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.2 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

END OF SECTION 075423

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes formed sheet metal flashings and trim.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.

C. Samples for Verification: For each type of exposed finish required.

D. Qualification Data: For qualified fabricator.

1.3 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

PART 2 - PRODUCTS

2.1 SHEET METAL

A. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, not less than 0.032 inch (0.8 mm) thick; and finished as follows:

1. Exposed Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight. Color to be selected from manufacturer's full range.
2. Concealed Finish: Manufacturer's standard white or light-colored acrylic or polyester backer finish.

B. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, with No. 2D finish; not less than 0.016 inch (0.4 mm) thick.

C. Zinc-Tin Alloy-Coated Stainless Steel: ASTM A 240/A 240M, Type 304, fully annealed stainless-steel sheet, not less than 0.015 inch (0.38 mm) thick, with 0.787-mil (0.020-mm) thickness zinc-tin alloy coating applied to each side.

D. Metallic-Coated Steel Sheet: Galvanized structural-steel sheet, ASTM A 653/A 653M, G90 (Z275), or aluminum-zinc alloy-coated structural-steel sheet, ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40 (Class AZM150 coating designation, Grade 275); 0.022-inch (0.56-mm).

1. Finish: Manufacturer's standard two-coat fluoropolymer system with color coat containing not less than 70 percent PVDF resin by weight.
2. Concealed Finish: Manufacturer's standard white or light-colored acrylic or polyester backer finish.

2.2 ACCESSORIES

A. Polyethylene Sheet: 6-mil- (0.15-mm-) thick polyethylene sheet complying with ASTM D 4397.

B. Felt Underlayment: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts.

C. Self-Adhering Sheet Underlayment, High Temperature: Butyl or SBS-modified asphalt; slip-resisting-polyethylene surfaced; with release paper backing; cold applied; 40 mils thick minimum. Stable after testing at 240 deg F (116 deg C) and passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.

D. Slip Sheet: Building paper, 3-lb/100 sq. ft. (0.16-kg/sq. m) minimum, rosin sized.

E. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
2. Exposed Fasteners: Heads matching color of sheet metal roofing using plastic caps or factory-applied coating.
3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
5. Fasteners for Zinc-Tin Alloy-Coated Stainless-Steel Sheet: Series 300 stainless steel.
6. Fasteners for Metallic-Coated Steel Sheet: Hot-dip galvanized steel or Series 300 stainless steel.

F. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

G. Solder for Zinc-Tin Alloy-Coated Stainless Steel: ASTM B 32, 100 percent tin.

H. Butyl Sealant: ASTM C 1311, solvent-release butyl rubber sealant.

I. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.3 FABRICATION

A. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles, or to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing" if more restrictive.

C. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.

D. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal. Fabricate of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

G. Counterflashing & Flashing Receivers: Fabricate from the following materials, to be determined based on surrounding materials:
1. Aluminum: 0.032 inch (0.81 mm).

2. Stainless Steel: 0.019 inch (0.48 mm).

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

B. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

C. Comply with SMACNA's "Architectural Sheet Metal Manual." Allow for thermal expansion; set true to line and level. Install Work with laps, joints, and seams permanently watertight and weatherproof; conceal fasteners where possible.

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

E. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

F. Install exposed sheet metal flashings and trim true to line, level and uniform, without excessive oil canning, buckling or tool marks, and to result in weathertight performance. Seal joints with elastomeric or epoxy sealant as required.

G. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

H. Fabricate nonmoving seams in sheet metal with flat-lock seams.

I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pretinned surface would show in finished Work.

1. Do not solder metallic-coated steel and aluminum sheet.
2. Do not pretin zinc-tin alloy-coated stainless steel.
3. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

J. Aluminum Flashing and Trim: Coat back side of aluminum flashing and trim with bituminous coating where it will contact wood, ferrous metal, or cementitious construction.

K. Separate dissimilar metals with a bituminous coating or polymer-modified, bituminous sheet underlayment.

END OF SECTION 076200

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes new roof accessory materials.

B. Section includes the following:

1. Parapet copings.
2. Reglets and counterflashings.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties. Include plans, elevations, expansion-joint locations, keyed details, and details of attachment to other work. Distinguish between plant- and field-assembled work.

C. Samples for Verification: For roof-edge drainage systems made from 12-inch (300-mm) lengths of full-size components including fasteners, cover joints, accessories, and attachments.

1.3 QUALITY ASSURANCE

A. Comply with SMACNA's "Architectural Sheet Metal Manual."

B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required. Smooth, flat surface with two-coat fluoropolymer finish.

B. Felt Underlayment: ASTM D 226, Type I, asphalt-saturated organic felts.

C. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements.

1. Exposed Penetrating Fasteners: Gasketed screws with heads matching color of metal.

2.2 ROOF SPECIALTIES

A. Copings & Cap Flashings: Manufactured coping system consisting of formed-metal coping cap in section lengths not exceeding 12 feet (3.6 m), concealed anchorage; corner units, end cap units, and concealed splice plates with same finish as coping caps. Include internal gutter/drain chair and continuous hold-down cleats. Coping shall be 22-guage galvanized steel with manufacturer’s standard Kynar 500 pre-finished coating, with 20-guage galvanized steel cleats. Coping system shall be fabricated with integral slope to require no additional sloped blocking. Coping width shall be designed to match existing parapet widths. Fasteners used for coping system shall be compatible with the coping system and listed for use in the existing parapet materials. Pre-finished color to match existing coping.

1. Basis-of-Design Product: “PermaSnap” Coping System by W.P. Hickman
2. Manufacturers: Subject to compliance with requirements, other manufacturers providing products that may be used include the following:

    a. Architectural Products Company.
    b. ATAS International, Inc.
    c. Johns Manville.
    d. Metal-Era, Inc.
    e. Metal-Fab Manufacturing, LLC.
    f. National Sheet Metal Systems, Inc.
    g. Perimeter Systems; a division of Southern Aluminum Finishing Company, Inc.

3. Any coping product used shall meet the minimum requirements noted or be similar in materials and performance to the specified Basis-of-Design product.

B. Reglets: **Provide only if determined in field to be necessary based on existing building materials and components.** Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, manufactured from formed aluminum or zinc-coated steel.

C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches (100 mm) and in lengths not exceeding 12 feet (3.6 m) designed to snap into reglets or overlapped with top termination bar, designed to compress against base flashings with joints lapped, manufactured from formed aluminum, zinc-coated steel or stainless steel.

2.3 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Remove existing roof coping and store for possible re-use. Provide new coping sections to match existing coping only where existing coping is damaged beyond repair.

B. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement.

C. Separate dissimilar metals with a bituminous coating or polymer-modified, bituminous sheet underlayment.

D. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

E. Allow for thermal expansion of roof specialties. Space expansion joints at a maximum of 50 feet (15.2 m) with no joints within 18 inches (450 mm) of corners or intersections unless indicated. Install expansion joint caps.

F. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm), except where pretinned surface would show in finished Work.

H. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering. Clean off excess solder and sealants.

END OF SECTION 077100

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes replacement materials to match existing materials. **Replacement of certain items to be required <u>only</u> if required because existing materials are damaged beyond repair and cannot be re-used**.

B. Section Includes:

1. Roof curbs.
2. Equipment supports.
3. Pipe supports.
4. Preformed flashing sleeves.

1.2 PERFORMANCE REQUIREMENTS

A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

1.3 SUBMITTALS

A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof accessories. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.4 COORDINATION

A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.

B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.5 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within **Twenty (20) years** of Substantial Completion.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation and mill phosphatized for field painting if indicated in Drawings.

B. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, AZ50 (AZM150) coated.

C. Aluminum Sheet: ASTM B 209 (ASTM B 209M), manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.

D. Aluminum Extrusions and Tubes: ASTM B 221 (ASTM B 221M), manufacturer's standard alloy and temper for type of use, finished to match assembly where used, otherwise mill finished.

E. Stainless-Steel Sheet and Shapes: ASTM A 240/A 240M or ASTM A 666, Type 304.

2.2 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Polyisocyanurate Board Insulation: ASTM C 1289, thickness as indicated.

C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.
   1. capability to provide a sound foundation for field-applied topcoats under prolonged exposure.

D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

E. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.

F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

G. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

H. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.3 ROOF CURBS

A. Roof Curbs: **Provide as required only if required to replace existing coping damaged beyond repair.** Internally reinforced roof-curb units (with integral spring-type vibration isolators where indicated in Drawings), capable of supporting superimposed live and dead loads to match existing, including equipment loads and other existing construction; with welded or mechanically fastened and sealed corner joints, and integrally formed deck-mounting flange at perimeter bottom.

B. Size: Coordinate dimensions with existing equipment rough-ins to match existing curbs.

C. Construction:

1. Insulation: Factory insulated with 1-1/2-inch- (38-mm-)thick glass-fiber board insulation.
2. Liner: Same material as curb, of manufacturer's standard thickness and finish.
3. Factory-installed wood nailer at top of curb, continuous around curb perimeter.
4. On ribbed or fluted metal roofs, form deck-mounting flange at perimeter bottom to conform to roof profile.
5. Fabricate curbs to minimum height of 18 inches (450 mm) above metal decking unless otherwise indicated.
6. Top Surface: Level around perimeter if required with roof slope accommodated by sloping the deck-mounting flange.

2.4 EQUIPMENT SUPPORTS

A. Equipment Supports: To be provided on element indicated in Drawings to be replaced and **provided elsewhere as required only if required to replace existing that are damaged beyond repair.** Internally reinforced metal equipment supports capable of supporting superimposed live and dead loads to match existing, including equipment loads and other existing construction; with welded or mechanically fastened and sealed corner joints, and integrally formed deck-mounting flange at perimeter bottom.

B. Size: Coordinate dimensions with existing equipment rough-ins

C. Construction: Match existing. Include metal counterflashing.

2.5 PIPE SUPPORTS

A. Pipe Supports: To be provided on element indicated in Drawings to be replaced and **provided elsewhere as required only if required to replace existing that are damaged beyond repair, or as indicated in Drawings.** Adjustable-height, extruded-aluminum tube, filled with urethane insulation; 2 inches (50 mm) in diameter; with aluminum baseplate, membrane roofing base seal, manufacturer's recommended hardware for mounting to structure or structural roof deck as indicated, and extruded-aluminum carrier assemblies; suitable for quantity of pipe runs and sizes.

2.6 PREFORMED FLASHING SLEEVES

A. Exhaust Vent Flashing: Double-walled metal flashing sleeve or boot, insulation filled, with integral deck flange, 12 inches (300 mm) high, with removable metal hood and slotted metal collar.

1. Metal: Aluminum sheet, 0.063 inch (1.60 mm) thick.
2. Finish: Manufacturer's standard.

B. Vent Stack Flashing: Metal flashing sleeve, uninsulated, with integral deck flange.

1. Metal: Aluminum sheet, 0.063 inch (1.60 mm) thick.
2. Height: 13 inches (330 mm).
3. Finish: Manufacturer's standard.

2.7 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

C. Verify dimensions of roof openings for roof accessories.

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

3.2 INSTALLATION

A. Remove existing roof accessories that are damaged beyond repair, unless noted otherwise to replace in Drawings. Otherwise prepare existing accessories to remain for new roofing installation, unless specifically noted in Drawings to be replaced**.**

B. General: Install roof accessories according to manufacturer's written instructions.

1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

C. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

D. Roof Curb and Equipment Support Installation: Install so top surface is level.

E. Pipe Support Installation: Install pipe supports so top surfaces are in contact with and provide equally distributed support along length of supported item.

F. Preformed Flashing-Sleeve Installation: Secure flashing sleeve to roof membrane according to flashing-sleeve manufacturer's written instructions.

G. Seal joints with sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

A. Clean exposed surfaces according to manufacturer's written instructions. Clean off excess sealants.

B. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Silicone joint sealants.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

D. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

D. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates.

E. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

F. Manufacturer's Warranty: 10 year.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants when ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (4.4 deg C); when substrates are wet; or where contaminants capable of interfering with adhesion have not yet been removed from substrates.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Colors of Exposed Joint Sealants: As selected from manufacturer's full range.

E. Provide sealants which are listed by the manufacturer as paintable in all locations requiring field painting.

2.2 JOINT SEALANTS

A. Sealant for General Exterior Use Where Another Type Is Not Specified, provide one of the Following:

1. Single-component, neutral-curing silicone sealant, ASTM C 920, Type S; Grade NS; Class 50; for Use NT.
2. Single-component, nonsag urethane sealant, ASTM C 920, Type S; Grade NS; Class 25; and for Use NT.

2.3 MISCELLANEOUS MATERIALS

A. Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Sealant Installation Standard: Comply with ASTM C 1193.

B. Comply with all written instructions as outlined by sealant manufacturer for products and applications indicated, unless more stringent requirements apply.

C. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

D. Joint Priming: Prime joint substrates as required per sealant manufacturer’s written instructions, and based on pre-construction field adhesion testing.

E. Install sealant backings to support sealants during application and to produce cross-sectional shapes and depths of installed sealants that allow optimum sealant movement capability.

F. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

G. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

H. Tool all non-sag sealants after application to remove excess material from adjacent surfaces.

I. Field test all joints for proper adhesion after joints have set per manufacturer’s requirements. Remove sealants failing to adhere to joint substrates during testing and replace as required.

END OF SECTION 079200

SECTION 099100 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and the application of paint and stain systems on the following exterior and interior substrates:
   1. Masonry.
   2. Galvanized metal.
   3. Ferrous metals (iron piping).
   4. Aluminum (not anodized or otherwise coated).
   5. Exterior wood.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat indicated.

1.3 QUALITY ASSURANCE

A. MPI Standards:

   1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List" to the greatest extent possible.
   2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

B. Applicator Qualifications: A reputable firm or individual experienced in applying paints and coatings similar in material and design to this project, whose previous work has been successful in service, performance, and appearance.

C. Mockups: Full-coat finish Sample of each type of coating, color, and substrate, applied where directed.

1.4 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.5 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the installed work. Include 2 gallons (7.6 L) of each color and type of coating applied.

PART 2 - PRODUCTS

2.1 PAINT- GENERAL

A. MPI Standards: Provide materials that comply with MPI standards indicated and listed in its "MPI Approved Products List" to the greatest extent possible.

B. Utilize paints which are comparable/equal to the "Basis-of-Design" products specified. Documentation regarding paint properties, quality and recommended applications shall be provided showing equal values to "Basis-of-Design" products specified.

C. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

D. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

E. Colors: As selected from manufacturer's full range of colors.

2.2 PAINT PRODUCTS

A. Basis of Design (Manufacturer): Paint products manufactured by PPG Architectural Finishes, Inc. (Pittsburgh Paints), products as specifically noted in paint schedules below.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Benjamin Moore & Co.
2. Duron, Inc.
3. ICI Paints.
4. Porter Paints.
5. Sherwin-Williams Company (The).

2.3 EXTERIOR PAINT MATERIALS (BASIS-OF-DESIGN PRODUCTS)

A. Masonry: (1) coat PPG 6-12 Speedhide Exterior Quick Dry Latex Sealer (dry film thickness = 8.5 mils.); (2) finish coats PPG 72-Line Sun-Proof Exterior Flat-Latex or PPG 78-Line Sun-Proof Exterior Semi-Gloss (dry film thickness = 1.2 mils.).

B. Zinc-Coated Metal: Full gloss alkyd enamel finish: (1) coat PPG 90-708 Pitt Tech Exterior Primer (dry film thickness = 20 mils.); (2) finish coats PPG 54-Line Quick Dry Enamel (dry film thickness – 1.7 mils).

C. Ferrous Metal: Full gloss alkyd enamel finish: (1) coat PPG 6-208 Speedhide Exterior Primer (dry film thickness = 1.7 mils); (2) finish coats PPG 54-Line Quick Dry Gloss Enamel (dry film thickness = 1.7 mils).

D. Aluminum: (1) coat PPG 17-921 PPG Aluminum Primer; (2) finish coats PPG 6-230 Speedhide Aluminum Paint (dry film thickness – 1.5 mils).

E. Exterior Wood: (1) coat PPG 6-609 PPG Primer; (2) finish coats PPG 6-2045XI Speedhide Exterior Paint (dry film thickness – 1.4 mils).

PART 3 - EXECUTION

3.1 PREPARATION

A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Remove hardware, plates, lighting fixtures, and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.

C. Clean and prepare all substrates to be painted according to manufacturer’s written instructions.

1. General: Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
2. Concrete Masonry: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions. Provide block filler as required by paint manufacturer.
3. Galvanized-Metal: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints. Clean with non-petroleum based solvents.
4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces with methods that comply with SSPC’s recommendations. Remove all existing rust from exposed iron piping.
5. Aluminum: Remove surface oxidation.

D. Schedule painting so cleaning operations will not damage newly painted surfaces.

E. Hazardous Materials: Any exterior elements requiring touch-up painting shall be verified with lead-based paint survey prior to any scraping or removal of paint. Properly dispose of any lead-based paint materials as required by all applicable federal, state and local codes.

3.2 APPLICATION

A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

B. Paint exposed surfaces (unless otherwise indicated), including any existing exposed gas piping.

C. Apply paints according to manufacturer's written instructions.

1. Do not paint over dirt, rust, or other conditions detrimental to paint film formation.
2. Provide finish coats which are compatible with primers used.
3. Apply paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).
4. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or to damp or wet surfaces.
5. Allow sufficient time between successive coats to allow proper drying.
6. Apply paints by brush, roller, or spray per manufacturer’s recommendations.
7. Minimum Coat Thickness: Apply paint materials no thinner than manufacturer’s recommended spreading rate to achieve manufacturer’s recommended dry film thickness.
8. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
9. Apply paint evenly over all surfaces. **Poor paint performance or appearance, as judged by Architect or Owner, due to poor paint application or workmanship, shall be removed and repainted at contractor’s expense.**
10. Protect surfaces not to be painted as required against damage from painting; surfaces which are painted accidentally shall be fully cleaned of paint or re-painted to match.
11. Protect all painted surfaces after paint application until project conclusion as necessary to maintain new painted finish.

D. Wood Surfaces: Only paint existing wood surfaces disturbed or otherwise damaged during re-roofing processes or roof repair processes. No other existing exterior wood to be painted.

3.3 CLEANING AND PROTECTION

A. Remove excess rubbish, empty cans, rags, and other discarded materials from Project site daily.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 099100

SECTION 221426 – ROOF DRAINS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Roof drains.

1.2 SUBMITTALS

A. Product Data: Catalog sheets, specifications and installation instructions for each type of product indicated.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Qualified installer with at least three (3) years of experience installing type of specified products.

B. Product Testing: Product type to be periodically tested using a qualified testing agency.

C. Manufacturer’s Warranty: 5 years.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of roof drains and joints between roof drains and piping when ambient and substrate temperature conditions are outside limits permitted by drain manufacturer; or when substrates are wet.

PART 2 - PRODUCTS

2.1 ROOF DRAINS

A. Drain Body: Standard ASME A112.6.4. for general purpose roof drains. Coated cast iron, 12 inches diameter, with integral bosses or lugs drilled and tapped for fastening flashing clamp and underdeck clamp, corrosion resistant bolts, bottom outlet and connection to match existing piping sizes.

B. Flashing Clamp: Coated cast iron, non-puncturing type compression ring with integral, notched gravel stop and dome locking strainer.

C. Dome Strainer: Coated cast iron, standard profile type, with narrow vertical slotted opening, bayonet locking flange, secured with stainless steel fasteners.

D. Basis-of-Design Product: Zurn Z121, 12 inch diameter roof drain, low silhouette dome.

E. Additional Manufacturers: Subject to compliance with requirements, other manufacturers providing products that may be used include the following:

1. Josam Company.
2. Jay R. Smith Manufacturing Company.
3. Tyler Pipe; Wade Division.

2.2 FASTENERS

A. Corrosion Resistant Fasteners: Type 302 or 304 stainless steel bolts.

PART 3 - EXECUTION

3.1 PREPARATION

A. Field verify all existing drain locations. Field-verify size(s) and type(s) of existing drain piping to remain.

B. Remove existing roof drains as required.

C. Inspect existing wood roof decking. Repair/patch any roof decking around drawings as indicated in Drawings.

3.2 INSTALLATION

A. Comply with all written instructions as outlined by roof drain manufacturer for products and applications indicated, unless more stringent requirements apply.

B. Coordinate drain installation with deck and roofing work.

C. Locate drains as indicated in Drawings.

D. Drains in Wood Decking: Set sump receiver surface level with the deck surface. Secure drain body with underdeck clamp. Connect roof drain to existing drainage piping with watertight seal.

E. Install flashing collar or flange of roof drain to prevent leakage between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.

F. Fasteners: Coat bolt threads with anti-seize lubricant before final installation. Secure external components in place with noted fastener types.

G. Field test roof drain and inspect to ensure watertight seal.

END OF SECTION 221426

INVITATION TO BID #2020-026 BENT MOUNTAIN CENTER ROOF REPLACEMENT

Attachment C

Limited Asbestos Roofing Survey Report
Issued July 30, 2019

LIMITED ASBESTOS ROOFING SURVEY REPORT

Bent Mountain Community Center
10148 Tinsley Lane
Roanoke, VA 24059

Prepared For:
Roanoke County General Services
1216 Kessler Road
Salem, VA 24153
Phone: 540.777.6345
Attention: Ron Riquelmy
Email: rriquelmy@roanokecountyva.gov

Issue Date: July 30, 2019

F&R Project Number: 62X-0281

Conducted By:	Prepared By:	Reviewed By:
Eric T. Kessler Environmental Scientist	Adam J. T. Day Environmental Scientist	E. Glenn Hargrove, CIH Director of Industrial Hygiene

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1.0 INTRODUCTION

Froehling & Robertson, Inc. (F&R) conducted limited asbestos survey consulting services on July 9, 2019 at the Bent Mountain Community Center located at 10148 Tinsley Lane in Roanoke, VA. It is F&R's understanding that the structure is the subject of planned roof replacement which may impact building materials. The following sections document the survey procedures and results. Refer to Appendix A for Personnel Accreditation documentation of F&R personnel associated with this survey.

1.1. Purpose

The purpose of the Asbestos Survey is to identify Asbestos-Containing Materials (ACMs) that may require appropriate removal, handling, and disposal procedures prior to scheduled renovation activities at the subject property. This survey is to aid in the determination of health and safety requirements during the conduct of work which may impact identified materials.

1.2. Site Description

The former school structure consists of an approximately 19,176 square foot building reportedly constructed circa 1930 (GIS data suggests an original construction date of 1950) with an additional portion added in 1990. The building consists of a community center with one and two story areas and multiple roof systems including a flat built up roof (BUR) on the original portion of the building, flat ballasted ethylene propylene diene terpolymer (EPDM) roofing (on the addition), and pitched roofing comprising both slate and metal roof finishes. Refer to Appendix B for site sketches of the facility, including asbestos sample locations.

Note that F&R utilizes Housing and Urban Development methodology for location identification modifiers: Side A is always the address side or the main entry side of the building. Then, proceeding in a clockwise direction the adjacent sides are labeled B, C and D; for example, the wall on the left side as one enters the building would be denoted as side B. Roof sections were appropriately labeled based upon their building materials.

It should be noted that material and color descriptions are subjective and that, due to the nature of the environment, identical materials and colors may have been labeled as different depending on the lighting, other colors in the area, and other factors.

2.0 SCOPE OF SERVICES

As outlined in F&R proposal number 1962-00799, the survey included the following services with respect to the proposed renovation:

- Identification and sampling, as necessary, of suspect ACMs.
- Determination of the presence, location, and estimated quantity of identified ACMs.

Based on information provided by the client, it is F&R's understanding that the extent of the renovation is replacement of all flat roofing on the structure. Consequently, only those areas which are anticipated to be impacted by the renovation scope of work were included in this survey; the building interior was excluded. As such, this survey as performed does not constitute a comprehensive building survey and this report shall not be utilized for the determination of presence or absence of Regulated Materials outside of the renovation area should the scope of work be altered or expanded beyond that of the currently scheduled upgrades and renovations.

3.0 LIMITED ASBESTOS-CONTAINING MATERIALS SURVEY

F&R's Virginia Licensed Asbestos Building Inspector, Eric Kessler (Virginia Asbestos License #3309 001850), conducted the limited Asbestos Survey of the current site structure located at 10148 Tinsley Lane, Roanoke, VA on July 9, 2019.

Federal Regulations (40 CFR Part 61, Subpart M – National Emission Standard for Asbestos (NESHAP)), as well as Virginia Department of Labor and Industry regulations require a thorough asbestos inspection of the structure to be conducted prior to the commencement of renovation and/or demolition activities. An ACM is defined by the Occupational Safety & Health Administration (OSHA) and the Environmental Protection Agency (EPA) as material containing greater than one percent (1%) asbestos.

3.1. Asbestos-Containing Materials (ACM) Methodology

This survey was conducted in general accordance with the Federal NESHAP and applicable State regulations for the presence of ACMs. The survey was characterized by a visual inspection and sampling of suspect building components at the subject property to be impacted by the proposed renovation/demolition activities.

Guidelines utilized in the asbestos survey were established by the EPA, ASTM International (ASTM), and The Environmental Information Association, Inc. (EIA). Utilized guidelines included: the Asbestos Hazard Emergency Response Act (40 CFR Part 763, Subpart E – Asbestos-Containing Materials in Schools (cited as AHERA)), ASTM Standard E2356-14 *Standard Practice for Comprehensive Building Asbestos Surveys*, and the EIA publication *Managing Asbestos in Buildings: A Guide for Owners and Managers – A Revision to the United States Environmental*

Protection Agency's 1985 document Guidance for Controlling Asbestos-Containing Materials in Buildings (EPA 560/5-85-024) Known as the Purple Book.

F&R's aforementioned Industrial Hygienist(s) collected and submitted suspect asbestos-containing bulk samples to the laboratory, of which, a total of twenty one (21) suspect asbestos-containing bulk samples with discernable layers were analyzed. Due to multiple layers, a total of forty-three (43) samples were analyzed.

Samples of suspect ACMs were organized as per the AHERA concept of Homogeneous Area (HA), collected, and transported to the Environmental Hazards Services, L.L.C. (EHS) testing laboratory. EHS is a National Institute for Standards and Technology (NIST) NVLAP accredited laboratory (NVLAP Lab Code: 101882-0) and Virginia licensed asbestos laboratory, in Richmond, Virginia, for analysis by Polarized Light Microscopy (PLM) following EPA Method 600/R-93/116. Refer to Appendix A for Laboratory Certificates of Accreditations. Refer to Appendix C for Laboratory Certificates of Analysis and Bulk Sample Chain of Custody Forms for further description of sampled materials/analytical results.

F&R collected bulk samples of roofing materials during this survey. Roof core sample locations were temporarily patched, as needed; however, F&R does not guarantee roof repairs and patches associated with sampling activities as F&R is not a professional roofer. Sampling activities were not coordinated with a professional roofing contractor; no contact information was provided or indicated as preferred by the Client.

3.2. Asbestos-Containing Materials Findings

The following material types were identified, sampled, and accordingly homogenized based upon similar construction discovered during bulk sampling:

- Roof Core
- Flashing Tar - Black
- Flashing Tar - Grey
- Flashing Tar - Grey – Historical
- Vent Tar - Grey
- Roof Tar
- Historical Roof Tar
- Grey Calk
- White Flashing Caulk
- White Flashing Caulk

The following table presents a summary of survey results from sampling events performed on July 9, 2019. Refer to Appendix B for illustration of the locations of collected bulk samples. Positive asbestos samples (samples containing >1% asbestos) are in **BOLD** type.

SUSPECT ASBESTOS-CONTAINING MATERIALS SAMPLE INFORMATION

Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
79EK-1A	**R**	**West Side Field Middle of Roof**	Roof core-Poured Pitch	Black Brittle	NAD
79EK-1B			**Roof core-Sealant/Mastic**	**Black Pliable to Brittle**	**5% Chrysotile**
79EK-1C			Roof core-Fibrous Glass Based Felt	Black Fibrous	NAD
79EK-1D			Roof core-Cellulose-Based Felt	Black Fibrous	NAD
79EK-2A	R	South West Side Field Middle at Large Patch	Roof core-Surface Membrane	Black to Gray Pliable	NAD
79EK-2B	R		Roof core-Poured Pitch	Black Brittle	NAD
79EK-2C	R		Roof core-Sealant/Mastic	Black Pliable to Brittle	NAD
79EK-2D	R		Roof core-Fibrous Glass-Based Felt	Black Fibrous	NAD
79EK-2E	R		Roof core-Cellulose-Based Felt	Black Fibrous	NAD
79EK-2F	R		Roof core-Cellulose Insulation Board	Tan Fibrous	NAD
79EK-3A	R	**East Side Adjacent to Parapet**	Roof core-Gravel-Set Surface Membrane	Black Pliable; Black to Grey Brittle; Gray Aggregate	NAD
79EK-3B	R		Roof core-Poured Pitch	Black Brittle	NAD
79EK-3C	**R**		**Roof core-Sealant/Mastic**	**Dark Brown to Black Pliable to Brittle**	**5% Chrysotile**
79EK-3D	R		Roof core-Fibrous Glass-Based Felt	Black Fibrous	NAD
79EK-3E	R		Roof core-Cellulose-Based Felt	Black Fibrous	NAD
79EK-4	R	North East Side of Slate Roof	Flashing Tar - Black	Black Pliable	NAD
79EK-5	R	North East Side of Slate Roof	Flashing Tar- Grey	Black to Gray Pliable	NAD
79EK-6A	**R**	**North East Side of Slate Roof**	**Flashing Tar- Grey historical -Sealant/Mastic**	**Gray Pliable to Brittle**	**18% Chrysotile**
79EK-6B	R		Flashing Tar- Grey historical-Poured Pitch	Black Brittle	NAD
79EK-07	R	North East Side Adjacent to EPDM	Flashing Tar - Grey	Black to Gray Pliable to Brittle	NAD

Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
79EK-8A	R	East Side Adjacent to Brick Wall	Fibrous Glass-Based Felt	Black Fibrous	NAD
79EK-8B	R		Poured Pitch	Black Brittle	NAD
79EK-09	**R**	**North West Side Adjacent to Slate Portion**	**Flashing Tar – Grey Historical**	**Black to Gray Pliable to Brittle**	**5% Chrysotile**
79EK-10	R	North West Side Adjacent to Round Vent	Vent Tar - Grey	Black to Gray Pliable to Brittle	NAD
79EK-11	R	North West Side Adjacent to Slate Portion	Flashing Tar - Black	Black Pliable to Brittle	NAD
79EK-12A	R	**North West Side Adjacent to Parapet Dividing Tar and Gravel and EPDM**	Outer Caulk Layer	Pale Beige-Gray Pliable	NAD
79EK-12B	**R**		**Inner Sealant/Caulk**	**Black Pliable to Brittle**	**5% Chrysotile**
79EK-13A	R	North West Side Adjacent to Parapet Dividing Tar and Gravel and EPDM	Outer Caulk Layer	Pale Beige-Gray Pliable	NAD
79EK-13B	R		Inner Gravel-Set Bituminous Layer	Black Brittle; Pale Gray Aggregate	NAD
79EK-14	R	West Side at Red Vent	Historical Roof Tar	Black Pliable to Brittle	NAD
79EK-15	R	West Side at Red Vent	Historical Roof Tar	Black Pliable to Brittle	NAD
79EK-16	R	West Side at Red Vent	Roof Tar	Black Pliable to Brittle	NAD
79EK-17	R	West Side at Red Vent	Roof Tar	Black Pliable to Brittle	NAD
79EK-18A	R	East Side Upper EPDM	Pliable Surface Membrane	Black Pliable	NAD
79EK-18B	R		Mastic/Sealant	Black to Gray Pliable	NAD
79EK-18C	R		Gypsum Insulation Board	Pale Beige Brittle; Tan/Gray Fibrous	NAD
79EK-18D	R		Foam Substrate Insulation	Pink Foam-Like	NAD
79EK-19A	R	South Side Lower EPDM	Pliable Surface Membrane	Black Pliable	NAD
79EK-19B	R		Mastic/Sealant	Black to Gray Pliable	NAD

Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Percent Asbestos
79EK-19C	R		Gypsum Insulation Board	Pale Beige Brittle; Tan/Gray Fibrous	NAD
79EK-19D	R		Foam Substrate Insulation	Blue Foam-Like	NAD
79EK-20	**R**	**EPDM section At Termination Bar on West Parapet of Upper section**	**Grey Caulk**	**Gray Pliable**	**5% Chrysotile**
79EK-21	**R**	**EPDM section At Termination Bar on East Side at Brick Wall with Metal Roof**	**Grey Caulk**	**Gray Pliable**	**5% Chrysotile**

[1]Situation: 1 –First; 2 – Second; B – Basement; R - Roof; E – Exterior; S - Shed
[2]NAD: No Asbestos Detected
[3]**Bold**: Asbestos Containing Material or Trace (<1%) Asbestos Present

3.3. Asbestos-Containing Materials Inventory

The following table presents identified materials containing greater than 1% asbestos. Photographic documentation of ACMs for reference is provided as Appendix D.

ASBESTOS-CONTAINING MATERIALS INVENTORY

Material Description	Material Location(s)	Result (Percent ACM)
Built-up tar-and-gravel roof-Sealant/Mastic layer	Tar-and-gravel portions of roof	5% Chrysotile
Flashing Tar- Grey historical	Tar-and-gravel portion: flashing	5%- 18% Chrysotile
Historical black caulk under white flashing caulk	Tar-and-gravel portion-Northwest Side Adjacent to Parapet Dividing Tar and Gravel and EPDM	5% Chrysotile
Grey Caulk	EPDM At Termination Bars	5% Chrysotile

SF = Square Feet | LF = Linear Feet | CF = Cubic Feet | TBD = To Be Determined

F&R presumes that, where materials have been documented to be ACMs and where those materials are similar to other materials which have not been found to be positive, those similar materials will be considered to be ACMs (i.e. where one material was analyzed and found to be positive, it is prudent to consider other similar materials positive, despite potential analytical data to the contrary).

3.3.1. Presumed Asbestos-Containing Materials

During the conduct of this survey, sampling was limited to those materials which were within the areas designated by the client, which were safely accessible, and which were able to be sampled without damaging systems or structures. As such, materials which were not included in the survey should be presumed to be positive, unless sampling is conducted and shown to be negative.

Note that asbestos was used in over 3,000 known products and was used extensively in construction materials including in insulation and finish materials such as drywall-based systems, acoustical tiles, caulks and mastics, vinyl-based materials, and specialty products. Asbestos also continues to be used in new construction because, as stated by the EPA, "the manufacture, importation, processing, and distribution in commerce of [various] products […] are not banned."

3.4. Asbestos-Containing Materials Recommendations

As detailed above, several materials were identified as asbestos-containing, utilized in various instances associated with the roof.

Prior to renovation activities, F&R recommends that the ACMs be appropriately removed, handled, and disposed of by an appropriately licensed/accredited Abatement Contractor utilizing appropriately licensed/accredited personnel.

F&R further recommends that a third party Asbestos Professional be retained to provide on-site surveillance and guidance of the Asbestos Abatement Contractor to confirm complete and proper removal/disposal of ACMs in accordance with applicable federal, state, and local regulations. This recommendation is made as a best practice to reduce potential exposure to workers and limit liability.

The Client should note that F&R has encountered instances in which materials were analyzed by Polarized Light Microscopy (PLM) (following EPA Method 600/R-93/116) for the presence of asbestos with a result of “None Detected”, but when analyzed by Transmission Electron Microscopy (TEM) for Non-friable Organically Bound (NOB) bulk material, analytical results have indicated that asbestos is present in quantities greater than 1%. The client should be aware that F&R has samples analyzed by the PLM method for a number of reasons (including financial and time considerations) and that this method is considered acceptable in the State of Virginia; however, some firms employ the more stringent TEM method which is required in some states. Therefore, it is possible that some materials identified as containing no asbestos within this report may, if subjected to a more stringent analytical method, reveal the presence of asbestos at concentrations of 1% or greater.

In addition, it should be noted that through NESHAP Applicability Determinations, asbestos bulk samples analyzed via PLM which indicate a result of asbestos content to be less than ten (10) percent, including trace amounts (<1%), the material in question shall either be assumed to be an ACM or further analyzed via PLM Point Count or TEM to verify asbestos content. Results obtained via PLM Point Count or TEM analysis shall supersede previous results obtained by standard PLM analysis. Samples with analytical results via PLM which indicate that no asbestos was detected are not required to be further analyzed via PLM Point Count or TEM.

Should additional suspect ACMs be discovered during renovation and/or demolition activities that have not been sampled and will be disturbed, F&R recommends the work be temporarily halted. Samples of suspect materials should be collected, analyzed, and handled accordingly prior to the resumption of renovation and/or demolition activities.

3.5. Applicable Regulations

3.5.1. EPA/NESHAP Regulations for Asbestos-Containing Materials

The U.S. Environmental Protection Agency promulgated the National Emission Standards for Hazardous Air Pollutants (NESHAP) [40 CFR Part 61], which addresses the application, removal, and disposal of asbestos-containing materials (ACM). Under NESHAP the following categories are defined for asbestos-containing materials:

Friable - When dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Non-friable - When dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Category I Non-friable ACM - Packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1% asbestos.

Category II Non-friable ACM – Material, excluding Category I Non-friable ACM, which contains more than 1% asbestos.

Regulated Asbestos Containing Material (RACM) – One of the following:

1. Friable ACM
2. Category I Non-friable ACM that has become friable.
3. Category I Non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading. The EPA NESHAP has determined that where a rotating blade (RB) roof cutter or equipment that similarly damages the roofing material is used to remove Category I roofing material, the removal of 5,580 square feet of that material will create 160 square feet of RACM.

4. Category II Non-friable ACM that has a high probability of becoming, or has become, friable by the forces expected to act on the material in the course of demolition or renovation operations.

Under NESHAP, the following actions are required:

1. Prior to the commencement of demolition or renovation activities, the building owner must inspect the affected facility or part of the facility where the demolition or renovation activities will occur for the presence of asbestos.

2. Remove RACM from the facility before activities begin that would break up, dislodge, or similarly disturb the material or preclude access for subsequent removal.

3. ACM need not be removed if:

   a) It is Category I non-friable ACM that is not in poor condition.
   b) It is on a facility component that is encased in concrete or other similar material and is adequately wet whenever exposed.
   c) It was not accessible for testing and was therefore not discovered until after demolition began and because of the demolition the material cannot be safely removed.
   d) It is Category II non-friable ACM and the probability is low that the material will become crumbled, pulverized, or reduced to powder during demolition.

3.5.2. Virginia Asbestos Hazard Management Program

The Virginia Department of Labor and Industry (DOLI) regulates asbestos through enforcement of the Virginia Occupational Safety and Health (VOSH) regulations, enforcement of the Environmental Protection Agency's National Emission Standards for Hazardous Air Pollutants (NESHAP), and enforcement of the Asbestos Notification regulations found in the Labor Laws of Virginia (§40.1-51.20). Agency locations and regulations can be found on the agency Web site http://www.doli.virginia.gov.

The Virginia Department of Professional and Occupational Regulation (DPOR) is responsible for company and individual licensure in Virginia. Licensure and regulatory information can be found on DPOR's Web site http://www.dpor.virginia.gov/

The Virginia Department of Environmental Quality (DEQ) is responsible for the regulation of landfills in Virginia. Information on the disposal of asbestos in Virginia landfills can be obtained from the DEQ Web site http://www.deq.state.va.us/.

3.5.3. OSHA Asbestos Regulations

The Occupational Safety and Health Administration (OSHA) regulates employee exposure to asbestos under 29 CFR 1926.1101 and 29 CFR 1910.1001. Work associated with known or suspect ACMs must be conducted according to these regulations in addition to the noted EPA regulations.

4.0 LIMITATIONS

This report has been prepared for the exclusive use of County of Roanoke and/or their agents. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. Conclusions and recommendations are based, in part, upon information provided to us by others and site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Observations and recommendations are based upon conditions readily visible at the site at the time of the site visit, and upon current industry standards.

During this study, suspect asbestos samples were submitted for analysis at a NVLAP-accredited laboratory via polarized light microscopy. Inaccessible areas, such as behind solid ceilings or behind solid walls were not surveyed; therefore, some target materials may not have been identified. As with similar surveys of this nature, actual conditions exist only at the precise locations from which samples were collected or tested. Areas inspected were limited to those designated by the scope of services by the Client. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. Unless otherwise noted, F&R does not claim to have performed exhaustive delineation and/or quantification of identified materials; it is the responsibility of the client or abatement contractor to verify locations and quantities of regulated materials. It is also understood that this is a non-invasive survey so that it is possible that concealed materials may be present that were not accessible during the original survey. No other warranty, expressed or implied, is made. Reasonable effort was made by inspection personnel to locate and sample suspect materials within the structure with regard to the scope of services. However, for a facility, the existence of unique or concealed ACMs and debris is a possibility. F&R does not warrant, guarantee or profess to have the ability to locate or identify all ACMs, or other chemicals of concern in a facility.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. O&M Plans, Encapsulation, Abatement, Removal, Tenant Notification, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with appropriate regulations. Compliance with regulations and response actions are the sole responsibility of the Client and should be conducted in accordance with local,

state, and/or federal requirements and should be performed by appropriately qualified and licensed/accredited personnel, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to local, state, or federal public agencies conditions at the site that may present a potential danger to public health, safety, or the environment. The Client agrees to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, information that may be necessary to prevent danger to public health, safety, or the environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site. F&R retains the right to revise this report if new information is later discovered or made available. The report must be presented in its entirety.

Appendix A

F&R Personnel and Laboratory Accreditations

April 30, 2018

Laboratory ID: 100420

Julie Dickerson
Environmental Hazards Services, LLC
7469 White Pine Road
Richmond, VA 23237

Dear Ms. Dickerson:

Congratulations! The AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC's Analytical Accreditation Board (AAB) has approved Environmental Hazards Services, LLC as an accredited Industrial Hygiene, Environmental Lead and Environmental Microbiology laboratory.

Accreditation documentation includes the IHLAP, ELLAP and EMLAP accreditation certificate, scope of accreditation document and a copy of the current AIHA-LAP, LLC license agreement (if your completed agreement is not on file at AIHA-LAP, LLC). The accreditation symbol has been designed for use by all AIHA-LAP, LLC accredited laboratories. If your laboratory chooses to use the symbol in its advertising the laboratory's accreditation, you must complete and return the AIHA-LAP, LLC license agreement to a Laboratory Accreditation Specialist. Once submitted, an electronic copy of the accreditation symbol will be sent to you.

Laboratory accreditation shall be maintained by continued compliance with IHLAP, ELLAP and EMLAP requirements *(see Policy Modules 2B, 2C, 2D, and 6)*, which includes proficient participation in AIHA-LAP, LLC approved proficiency testing, demonstration of competency, or round robin program as indicated on the AIHA-LAP "Approved PT and Round Robin" webpage, its associated Scope/PT table, and as required in Policy Module 6, for all Fields of Testing (FoTs) for which the laboratory is accredited. An accredited laboratory that wishes to expand into a new FoT must submit an updated accreditation application to AIHA-LAP, LLC for review by the AAB.

Any changes in ownership, laboratory location, personnel, FoTs/Methods, or significant procedural changes shall be reported to AIHA-LAP, LLC in writing within twenty (20) business days of the change.

The accreditation certificate is the property of AIHA-LAP, LLC and must be returned to us should your laboratory withdraw or be removed from the IHLAP, ELLAP and EMLAP.

Again, congratulations. If you have any questions, please contact Lauren Schnack, Laboratory Accreditation Specialist, at (703) 846-0716.

Sincerely,

Cheryl O. Morton

Cheryl O. Morton
Managing Director

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Environmental Hazards Services, LLC

7469 White Pine Road, Richmond, VA 23237

Laboratory ID: 100420

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories* in the following:

LABORATORY ACCREDITATION PROGRAMS

✓	**INDUSTRIAL HYGIENE**	Accreditation Expires: May 01, 2020
✓	**ENVIRONMENTAL LEAD**	Accreditation Expires: May 01, 2020
✓	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires: May 01, 2020
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2005 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Beth Bair

Elizabeth Bair
Chairperson, Analytical Accreditation Board

Cheryl O. Morton

Cheryl O. Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision 16: 03/21/2018

Date Issued: 04/30/2018

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

Environmental Hazards Services, LLC
7469 White Pine Road, Richmond, VA 23237

Laboratory ID: **100420**
Issue Date: 08/15/2018

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Industrial Hygiene Laboratory Accreditation Program (IHLAP)

Initial Accreditation Date: 03/01/1990

IHLAP Scope Category	**Field of Testing (FoT)** (FoTs cover all relevant IH matrices)	**Technology sub-type/ Detector**	**Published Reference Method/Title of In-house Method**	**Method Description or Analyte** *(for internal methods only)*
Chromatography Core	Gas Chromatography	GC/ECD	NIOSH 5503	
Spectrometry Core	Inductively-Coupled Plasma	ICP/AES	ASTM E1979-17	
			EPA SW-846 6010D	
			NIOSH 7300 Modified	
	Infrared		NIOSH 7602	
Asbestos/Fiber Microscopy Core	Phase Contrast Microscopy (PCM)		NIOSH 7400	
Miscellaneous Core	Gravimetric		NIOSH 0500	
			NIOSH 0600	

A complete listing of currently accredited Industrial Hygiene laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

Environmental Hazards Services, LLC
7469 White Pine Road, Richmond, VA 23237

Laboratory ID: **100420**
Issue Date: 04/30/2018

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

The EPA recognizes the AIHA-LAP, LLC ELLAP program as meeting the requirements of the National Lead Laboratory Accreditation Program (NLLAP) established under Title X of the Residential Lead-Based Paint Hazard Reduction Act of 1992 and includes paint, soil and dust wipe analysis. Air and composited wipes analyses are not included as part of the NLLAP.

Environmental Lead Laboratory Accreditation Program (ELLAP)

Initial Accreditation Date: 03/01/1999

Field of Testing (FoT)	Technology sub-type/ Detector	Method	Method Description (*for internal methods only*)
Paint		ASTM E1979-17	
		EPA SW-846 3050B	
		EPA SW-846 6010D	
		EPA SW-846 7000B	
Soil		ASTM E1979-17	
		EPA SW-846 3050B	
		EPA SW-846 6010D	
		EPA SW-846 7000B	
Settled Dust by Wipe		ASTM E1979-17	
		EPA SW-846 3050B	
		EPA SW-846 6010D	
		EPA SW-846 7000B	
Airborne Dust		ASTM E1979-17	
		EPA SW-846 6010D	
		EPA SW-846 7000B	
		NIOSH 7082	
		NIOSH 7300 Modified	
Composited Wipes		ASTM E1979-17 Modified	
		EPA SW-846 6010D	
		EPA SW-846 7000B	

A complete listing of currently accredited Environmental Lead laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC

SCOPE OF ACCREDITATION

Environmental Hazards Services, LLC
7469 White Pine Road, Richmond, VA 23237

Laboratory ID: **100420**
Issue Date: 04/30/2018

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Environmental Microbiology Laboratory Accreditation Program (EMLAP)

Initial Accreditation Date: 03/01/2005

EMLAP Category	Field of Testing (FoT)	Method	Method Description (*for internal methods only*)
Fungal	Air - Direct Examination	SOP H	In-House: Analysis of Spore Trap Samples
	Bulk - Direct Examination	SOP H	In-House: Analysis of IAQ Bulk Samples
	Surface - Direct Examination	SOP H	In-House: Analysis of IAQ Surface Samples

A complete listing of currently accredited Environmental Microbiology laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101882-0

Environmental Hazards Services, L.L.C.

N. Chesterfield, VA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2019-01-01 through 2019-12-31

Effective Dates

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

For the National Voluntary Laboratory Accreditation Program

NVLAP® National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Environmental Hazards Services, L.L.C.
7469 Whitepine Road
N. Chesterfield, VA 23237-2261
Ms. Julie Dickerson
Phone: 804-275-4788 Fax: 804-275-4907
Email: jdickerson@leadlab.com
http://www.leadlab.com

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 101882-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

For the National Voluntary Laboratory Accreditation Program

Effective 2019-01-01 through 2019-12-31

COMMONWEALTH of VIRGINIA

Department of Professional and Occupational Regulation
9960 Mayland Drive, Suite 400, Richmond, VA 23233
Telephone: (804) 367-8500

EXPIRES ON
12-31-2019

NUMBER
3333000340

BOARD FOR ASBESTOS, LEAD, AND HOME INSPECTORS
ASBESTOS ANALYTICAL LABORATORY LICENSE
PCM PLM

ENVIRONMENTAL HAZARDS SERVICES LLC
7469 WHITEPINE ROAD
RICHMOND, VA 23237-0000

Jay W. DeBoer Director

Status can be verified at http://www.dpor.virginia.gov

(SEE REVERSE SIDE FOR PRIVILEGES AND INSTRUCTIONS)

DPOR-LIC (02/2017)

(DETACH HERE)

COMMONWEALTH of VIRGINIA
Department of Professional and Occupational Regulation

BOARD FOR ASBESTOS, LEAD, AND HOME INSPECTORS
ASBESTOS ANALYTICAL LABORATORY LICENSE

PCM PLM
NUMBER: 3333000340 EXPIRES: 12-31-2019

ENVIRONMENTAL HAZARDS SERVICES LLC
7469 WHITEPINE ROAD
RICHMOND, VA 23237-0000

(FOLD)

Status can be verified at http://www.dpor.virginia.gov

DPOR-PC (02/2017)

DPOR License Lookup License Number 3303001281

License Details

Name	HARGROVE, ERNEST GLENN
License Number	3303001281
License Description	Asbestos Inspector License
Rank	Asbestos Inspector
Address	ROANOKE, VA 24019
Initial Certification Date	1990-12-27
Expiration Date	2020-03-31

DPOR License Lookup build 1,198 (built 2017-07-13 02:34:41).

DPOR License Lookup License Number 3303004156

License Details

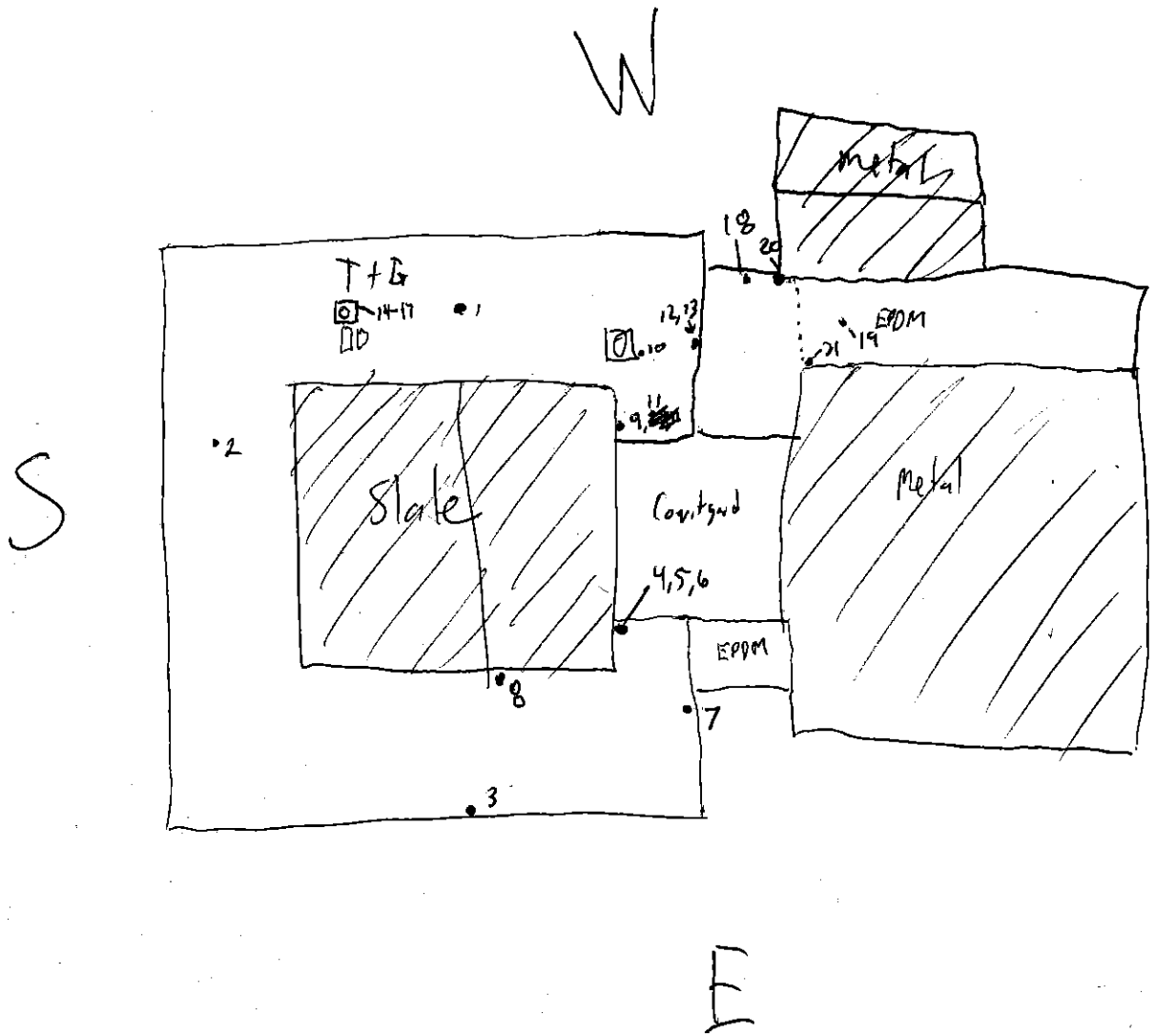
Name	KESSLER, ERIC THOMAS
License Number	3303004156
License Description	Asbestos Inspector License
Rank	Asbestos Inspector
Address	ROANOKE, VA 24015
Initial Certification Date	2016-04-19
Expiration Date	2020-04-30

DPOR License Lookup build 1,198 (built 2017-07-13 02:34:41).

Appendix B

Facility Sketch:
Roofing
Sample Locations

62X-0281 Bent Mtn. Center Roof Asbestos Survey



Appendix C

Laboratory Certificates of Analysis
Bulk Sample Chain of Custody Forms

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237
Telephone: 800.347.4010

Asbestos Bulk Analysis Report

Report Number: 19-07-01524

Client: Froehling & Robertson Inc. - Roanoke
1734 Seibel Drive, N.E.
Roanoke, VA 24012

Received Date: 07/10/2019
Analyzed Date: 07/13/2019
Reported Date: 07/15/2019

Project/Test Address: 62X-0281; Bent Mountain Center; Roanoke, Virginia

Client Number: 48-4628

Fax Number: 540-344-3657

Laboratory Results

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-07-01524-001A	79EK-01	Other *	Black Brittle; Homogeneous	NAD	3% Cellulose 3% Fibrous Glass 94% Non-Fibrous
* Poured Pitch-Type Material					
19-07-01524-001B	79EK-01	Other *	Black Pliable to Brittle; Homogeneous	5% Chrysotile	3% Cellulose 2% Fibrous Glass 90% Non-Fibrous
			Total Asbestos:	5%	
* Sealant/Mastic-Type Material					
19-07-01524-001C	79EK-01	Other *	Black Fibrous; Homogeneous	NAD	55% Fibrous Glass 45% Non-Fibrous
* Fibrous Glass-Based Felt-Type Material					
19-07-01524-001D	79EK-01	Other *	Black Fibrous; Homogeneous	NAD	55% Cellulose 10% Hair 35% Non-Fibrous
* Cellulose-Based Felt-Type Material					
19-07-01524-002A	79EK-02	Other *	Black to Gray Pliable; Homogeneous	NAD	2% Cellulose 2% Fibrous Glass 96% Non-Fibrous
* Surface Membrane-Type Material					

Client Number: 48-4628 Report Number: 19-07-01524

Project/Test Address: 62X-0281; Bent Mountain Center; Roanoke, Virginia

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-07-01524-002B	79EK-02	Other *	Black Brittle; Homogeneous	NAD	3% Cellulose 2% Fibrous Glass 95% Non-Fibrous
* Poured Pitch-Type Material					
19-07-01524-002C	79EK-02	Other *	Black Pliable to Brittle; Homogeneous	NAD	3% Cellulose 4% Fibrous Glass 93% Non-Fibrous
* Sealant/Mastic-Type Material					
19-07-01524-002D	79EK-02	Other *	Black Fibrous; Homogeneous	NAD	55% Fibrous Glass 45% Non-Fibrous
* Fibrous Glass-Based Felt-Type Material					
19-07-01524-002E	79EK-02	Other *	Black Fibrous; Homogeneous	NAD	55% Cellulose 10% Hair 35% Non-Fibrous
* Cellulose-Based Felt-Type Material					
19-07-01524-002F	79EK-02	Other *	Tan Fibrous; Homogeneous	NAD	80% Cellulose 20% Non-Fibrous
* Cellulose Insulation Board-Type Material					
19-07-01524-003A	79EK-03	Other *	Black Pliable; Black to Gray Brittle; Gray Aggregate; Inhomogeneous	NAD	2% Cellulose 3% Fibrous Glass 15% Synthetic 80% Non-Fibrous
* Gravel-Set Surface Membrane-Type Material					
19-07-01524-003B	79EK-03	Other *	Black Brittle; Homogeneous	NAD	3% Cellulose 3% Synthetic 94% Non-Fibrous
* Poured Pitch-Type Material					

Environmental Hazards Services, L.L.C

Client Number: 48-4628 Report Number: 19-07-01524

Project/Test Address: 62X-0281; Bent Mountain Center; Roanoke, Virginia

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-07-01524-003C	79EK-03	Other *	Dark Brown to Black Pliable to Brittle; Homogeneous	5% Chrysotile	2% Cellulose 3% Fibrous Glass 90% Non-Fibrous
				Total Asbestos: 5%	
* Sealant/Mastic-Type Material					
19-07-01524-003D	79EK-03	Other *	Black Fibrous; Homogeneous	NAD	55% Fibrous Glass 45% Non-Fibrous
* Fibrous Glass-Based Felt-Type Material					
19-07-01524-003E	79EK-03	Other *	Black Fibrous; Homogeneous	NAD	55% Cellulose 10% Hair 35% Non-Fibrous
* Cellulose-Based Felt-Type Material					
19-07-01524-004	79EK-04		Black Pliable; Homogeneous	NAD	30% Cellulose 70% Non-Fibrous
19-07-01524-005	79EK-05		Black to Gray Pliable; Homogeneous	NAD	30% Cellulose 70% Non-Fibrous
19-07-01524-006A	79EK-06	Other *	Gray Pliable to Brittle; Homogeneous	18% Chrysotile	2% Cellulose 80% Non-Fibrous
				Total Asbestos: 18%	
* Sealant/Mastic-Type Material					
19-07-01524-006B	79EK-06	Other *	Black Brittle; Homogeneous	NAD	2% Cellulose 98% Non-Fibrous
* Poured Pitch-Type Material					
19-07-01524-007	79EK-07		Black to Gray Pliable to Brittle; Inhomogeneous	NAD	35% Cellulose 65% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 48-4628 Report Number: 19-07-01524

Project/Test Address: 62X-0281; Bent Mountain Center; Roanoke, Virginia

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-07-01524-008A	79EK-08	Other *	Black Fibrous; Homogeneous	NAD	55% Fibrous Glass 45% Non-Fibrous
* Fibrous Glass-Based Felt-Type Material					
19-07-01524-008B	79EK-08	Other *	Black Brittle; Homogeneous	NAD	2% Cellulose 2% Fibrous Glass 96% Non-Fibrous
* Poured Pitch-Type Material					
19-07-01524-009	79EK-09		Black to Gray Pliable to Brittle; Inhomogeneous	5% Chrysotile	7% Cellulose 88% Non-Fibrous
			Total Asbestos:	5%	
19-07-01524-010	79EK-10		Black to Gray Pliable to Brittle; Inhomogeneous	NAD	30% Cellulose 70% Non-Fibrous
19-07-01524-011	79EK-11		Black Pliable to Brittle; Inhomogeneous	NAD	30% Cellulose 70% Non-Fibrous
19-07-01524-012A	79EK-12	Other *	Pale Beige-Gray Pliable; Homogeneous	NAD	100% Non-Fibrous
* Outer Caulk Layer					
19-07-01524-012B	79EK-12	Other *	Black Pliable to Brittle; Homogeneous	5% Chrysotile	20% Cellulose 75% Non-Fibrous
			Total Asbestos:	5%	
* Inner Sealant/Caulk-Type Layer					
19-07-01524-013A	79EK-13	Other *	Pale Beige-Gray Pliable; Homogeneous	NAD	100% Non-Fibrous
* Outer Caulk Layer					

Environmental Hazards Services, L.L.C

Client Number: 48-4628 Report Number: 19-07-01524

Project/Test Address: 62X-0281; Bent Mountain Center; Roanoke, Virginia

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-07-01524-013B	79EK-13	Other *	Black Brittle; Pale Gray Aggregate; Inhomogeneous	NAD	2% Cellulose 98% Non-Fibrous
* Inner Gravel-Set Bituminous Layer					
19-07-01524-014	79EK-14		Black Pliable to Brittle; Homogeneous	NAD	35% Cellulose 65% Non-Fibrous
19-07-01524-015	79EK-15		Black Pliable to Brittle; Homogeneous	NAD	25% Cellulose 75% Non-Fibrous
19-07-01524-016	79EK-16		Black Pliable to Brittle; Homogeneous	NAD	35% Cellulose 65% Non-Fibrous
19-07-01524-017	79EK-17		Black Pliable to Brittle; Homogeneous	NAD	30% Cellulose 70% Non-Fibrous
19-07-01524-018A	79EK-18	Other *	Black Pliable; Homogeneous	NAD	100% Non-Fibrous
* Pliable Surface Membrane-Type Material					
19-07-01524-018B	79EK-18	Other *	Black to Gray Pliable; Homogeneous	NAD	5% Cellulose 95% Non-Fibrous
* Mastic/Sealant-Type Material					
19-07-01524-018C	79EK-18	Other *	Pale Beige Brittle; Tan/Gray Fibrous; Inhomogeneous	NAD	15% Cellulose 85% Non-Fibrous
* Gypsum Insulation Board-Type Material					

Environmental Hazards Services, L.L.C

Client Number: 48-4628 Report Number: 19-07-01524

Project/Test Address: 62X-0281; Bent Mountain Center; Roanoke, Virginia

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
19-07-01524-018D	79EK-18	Other *	Pink Foam-Like; Homogeneous	NAD	100% Non-Fibrous
* Foam Substrate Insulation-Type Material					
19-07-01524-019A	79EK-19	Other *	Black Pliable; Homogeneous	NAD	100% Non-Fibrous
* Pliable Surface Membrane-Type Material					
19-07-01524-019B	79EK-19	Other *	Black to Gray Pliable; Homogeneous	NAD	4% Cellulose 96% Non-Fibrous
* Mastic/Sealant-Type Material					
19-07-01524-019C	79EK-19	Other *	Pale Beige Brittle; Tan/Gray Fibrous; Inhomogeneous	NAD	15% Cellulose 85% Non-Fibrous
* Gypsum Insulation Board-Type Material					
19-07-01524-019D	79EK-19	Other *	Blue Foam-Like; Homogeneous	NAD	100% Non-Fibrous
* Foam Substrate Insulation-Type Material					
19-07-01524-020	79EK-20		Gray Pliable; Homogeneous	5% Chrysotile	15% Cellulose 80% Non-Fibrous
			Total Asbestos:	5%	
19-07-01524-021	79EK-21		Gray Pliable; Homogeneous	5% Chrysotile	15% Cellulose 80% Non-Fibrous
			Total Asbestos:	5%	

Environmental Hazards Services, L.L.C

Client Number: 48-4628 Report Number: 19-07-01524

Project/Test Address: 62X-0281; Bent Mountain Center; Roanoke, Virginia

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials

QC Sample: 38-M22009-1

QC Blank: SRM 1866 Fiberglass

Reporting Limit: 1% Asbestos

Method: EPA Method 600/R-93/116, EPA Method 600/M4-82-020

Analyst: Mark Case

Reviewed By Authorized Signatory: Howard D. Varner

Howard Varner
General Manager

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Each distinct component in an inhomogeneous sample was analyzed separately and reported as a composite. Results represent the analysis of samples submitted by the client. Sample location, description, area, volume, etc., was provided by the client. This report cannot be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714 NVLAP #101882-0 VELAP 460172. All information concerning sampling location, date, and time can be found on Chain-of-Custody. Environmental Hazards Services, L.L.C. does not perform any sample collection.

Environmental Hazards Services, L.L.C. recommends reanalysis by point count (for more accurate quantification) or Transmission Electron Microscopy (TEM), (for enhanced detection capabilities) for materials regulated by EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by polarized light microscopy (PLM). Both services are available for an additional fee.

400 Point Count Analysis, where noted, performed per EPA Method 600/R-93/116 with a Reporting Limit of 0.25%.

* All California samples analyzed by Polarized Light Microscopy, EPA Method 600/M4-82-020, Dec. 1982.

LEGEND: NAD = no asbestos detected

19-07-01524

Due Date:
07/15/2019
(Monday)
ER MC

mse

SI 21 PM

Asbestos Chain-of-Custody

EHS Laboratories™

Environmental Hazards Services, LLC

www.leadlab.com
(800)347-4010
(804)275-4907 (fax)

7469 Whitepine Rd
Richmond, VA
23237

Company Name: Froehling & Robertson Address: 1734 Seibel Drive NE City/State/Zip: Roanoke, Virginia 24012

Phone: (540) 293-0200 Fax: (540) 344-3657 E-mail: ekessler@fandr.com Acct. Number:

Project Name / Testing Address: Bent Mountain Center **City/State (Required):** Roanoke, Virginia

Collected by: Eric Kessler Purchase Order Number: 62X- 0281

Turn Around Times : *If no TAT is specified, sample(s) will be processed and charged as 3-day TAT.*

_____ 1 - Day _____ 2 - Day ✓ 3 - Day _____ Same Day (Must Call Ahead) _____ Weekend (Must Call Ahead)

No.	Client Sample ID	Date Collected	ASBESTOS							AIR					COMMENTS
			PLM	PLM Point Count 400	PLM Point Count 1000	PLM NY Protocol	PCM	TEM Chatfield (Bulk)	TEM AHERA (Air)	Time On	Time Off	Flow Rate (L/min)	Total Time (minutes)	Volume (Total Liters)	
1	79EK-01	7-9-19	✓												
2	79EK-02	7-9-19	✓												
3	79EK-03	7-9-19	✓												
4	79EK-04	7-9-19	✓												
5	79EK-05	7-9-19	✓												
6	79EK-06	7-9-19	✓												
7	79EK-07	7-9-19	✓												
8	79EK-08	7-9-19	✓												
9	79EK-09	7-9-19	✓												
10	79EK-10	7-9-19	✓												

Released by: Eric T. Kessler	Signature:	Date/Time: 7-9-19
Received by:	Signature:	Date/Time: 7/10/19 11:5

EHS Laboratories™

Environmental Hazards Services, LLC

www.leadlab.com
(800)347-4010
(804)275-4907 (fax)

7469 Whitepine Rd
Richmond, VA
23237

Asbestos Chain-of-Custody

1524

~ For Lab Use Only ~

Company Name: Froehling & Robertson Address: 1734 Seibel Drive NE City/State/Zip: Roanoke, Virginia 24012

Phone: (540) 293-0200 Fax: (540) 344-3657 E-mail: ekessler@fandr.com Acct. Number:

Project Name / Testing Address: Bent Mountain Center **City/State (Required):** Roanoke, Virginia

Collected by: Eric Kessler Purchase Order Number: 62X- 0281

Turn Around Times : ***If no TAT is specified, sample(s) will be processed and charged as 3-day TAT.***

_____ 1 - Day _____ 2 - Day ✓ 3 - Day _____ Same Day (Must Call Ahead) _____ Weekend (Must Call Ahead)

No.	Client Sample ID	Date Collected	ASBESTOS							AIR					COMMENTS
			PLM	PLM Point Count 400	PLM Point Count 1000	PLM NY Protocol	PCM	TEM Chatfield (Bulk)	TEM AHERA (Air)	Time On	Time Off	Flow Rate (L/min)	Total Time (minutes)	Volume (Total Liters)	
1	79EK- 11	7-9-19	✓												
2	79EK- 12	7-9-19	✓												
3	79EK- 13	7-9-19	✓												
4	79EK- 14	7-9-19	✓												
5	79EK- 15	7-9-19	✓												
6	79EK- 16	7-9-19	✓												
7	79EK- 17	7-9-19	✓												
8	79EK- 18	7-9-19	✓												
9	79EK- 19	7-9-19	✓												
10	79EK- 20	7-9-19	✓												

Released by: Eric T. Kessler	Signature:	Date/Time: 7-9-19
Received by:	Signature:	Date/Time: 7/10/19 11:5

EHS Laboratories™

Environmental Hazards Services, LLC

www.leadlab.com
(800)347-4010
(804)275-4907 (fax)

7469 Whitepine Rd
Richmond, VA
23237

Asbestos Chain-of-Custody

1524

~ For Lab Use Only ~

Company Name: Froehling & Robertson Address: 1734 Seibel Drive NE City/State/Zip: Roanoke, Virginia 24012

Phone: (540) 293-0200 Fax: (540) 344-3657 E-mail: ekessler@fandr.com Acct. Number:

Project Name / Testing Address: Bent Mountain Center **City/State (Required):** Roanoke, Virginia

Collected by: Eric Kessler Purchase Order Number: 62X- 0281

Turn Around Times : ***If no TAT is specified, sample(s) will be processed and charged as 3-day TAT.***

_____ 1 - Day _____ 2 - Day ✓ 3 - Day _____ Same Day (Must Call Ahead) _____ Weekend (Must Call Ahead)

No.	Client Sample ID	Date Collected	ASBESTOS							AIR					COMMENTS
			PLM	PLM Point Count 400	PLM Point Count 1000	PLM NY Protocol	PCM	TEM Chatfield (Bulk)	TEM AHERA (Air)	Time On	Time Off	Flow Rate (L/min)	Total Time (minutes)	Volume (Total Liters)	
1	79EK- 21	7-9-19	✓												
2															
3															
4															
5															
6															
7															
8															
9															
10															

Released by: Eric T. Kessler	Signature:	Date/Time: 7-9-19
Received by: Trohan	Signature:	Date/Time: 7/10 1:19 PM

SINCE F&R 1881

TABLE NO. 1
ASBESTOS BULK SAMPLING RECORD

F&R Project No.: 62A-0291
Inspector: Kessler
Inspection Date: 7-9-19
Client: Roanoke County DGS
Location: Bent Mtn. Center

Key
M: Miscellaneous Material **S: Surfacing Material** **TSI: Thermal Systems Insulation** **NAD: No Asbestos Detected**
SF: Square Feet **LF: Linear Feet** **EA: Each**

Sample#	Material Type	Sample Location	Condition[1]	Quantity[2]	Friable	ACM %	ACM Type
79EK-01	roof core	tar and gravel portion - W side field middle					
79EK-02	roof core	tar and gravel portion - SW side field middle at large patch					
79EK-03	roof core	tar and gravel portion - E side adj. to parapet					
79EK-04	flashing tar - Black	tar and gravel portion - NE of Slate roof					
79EK-05	flashing tar - Grey	tar and gravel portion - NE of slate roof					
79EK-06	flashing tar - Grey - historical	tar and gravel portion - NE of slate roof					
79EK-07	flashing tar - Grey	tar and gravel portion - NE - adj. to EPDM section					
79EK-08	pitch pocket	tar and gravel portion - E - side adj. to brick wall					
79EK-09	flashing tar - Grey historical	tar and gravel portion - NW - adj. to Slate portion					
79EK-10	Vent tar - Grey	tar and gravel portion - NW - at round vent					
79EK-11	flashing tar - black	tar and gravel portion - NW - adj. to Slate portion					
79EK-12	white flashing caulk	tar and gravel portion - NW - at parapet dividing T&G and EPDM					
79EK-13	white flashing caulk	tar and gravel portion - NW - at parapet dividing T&G and EPDM					
79EK-14	historical roof tar	tar and gravel portion - W - at Red vent					
79EK-15	historical roof tar	tar and gravel portion - W - at Red vent					
79EK-16	roof tar	tar and gravel portion - W - at Red vent					
79EK-17	roof tar	tar and gravel portion - W - at Red vent					
79EK-18	roof core	EPDM - upper - East side					
79EK-19	roof core	EPDM - lower - S side					
79EK-20	grey caulk	EPDM - at ferring strip on W - parapet of upper					

[1] – (G) Good (No damage); (D) Damaged (<10% distributed or <25% localized); (SD) Significantly Damaged (>10% distributed or >25% localized)
[2]- All volumes and areas of ACMs cited in this report are estimates based on visible and inferred site conditions; actual quantities may vary.

79EK-21 grey caulk EPDM at ferring strip on E side @ brick wall w/ membrane roof

Appendix D

Photographic Documentation

Photograph #0001 Bent Mountain Center –Building Exterior – A Side

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Photograph #0002 Tar-and-gravel portion– ACM roofing (5% Chrysotile)

Photograph #0003 Tar-and-gravel portion – Historical grey roof sealant (5% Chrysotile)

Photograph #0004 EPDM Portion—Grey caulk (5% Chrysotile) at termination bar

Photograph #0005 B/C Corner of Settlement Basins

INVITATION TO BID #2020-026 BENT MOUNTAIN CENTER ROOF REPLACEMENT

Attachment D

Limited Asbestos Survey and Lead-Based Inspection Report
Issued August 26, 2019

LIMITED ASBESTOS SURVEY AND LEAD-BASED PAINT INSPECTION REPORT

Bent Mountain Community Center
10148 Tinsley Lane
Roanoke, Virginia 24059

Prepared For:
Roanoke County General Services
1216 Kessler Mill Road
Salem, Virginia 24153
Phone: 540.777.6345
Attention: Ron Riquelmy
Email: rriquelmy@roanokecountyva.gov

Issue Date: August 26, 2019

F&R Project Number: 62X-0328

Conducted/Reviewed By:

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1.0 INTRODUCTION

Froehling & Robertson, Inc. (F&R) conducted a Limited Asbestos Survey and Lead-Based Paint (LBP) Inspection on August 8 and 12, 2019, at the Bent Mountain Community Center located at 10148 Tinsley Lane in Roanoke, Virginia. It is F&R's understanding that the structure is the subject of scheduled renovations which may impact building materials. The following sections document the survey procedures and results. Refer to Appendix A for Personnel Accreditation documentation of F&R personnel associated with this survey.

1.1. Purpose

The purpose of the Limited Asbestos Survey and LBP Inspection was to identify Asbestos-Containing Materials (ACMs) and LBP coatings that may require appropriate removal, handling, and disposal procedures prior to scheduled renovation activities at the subject property. This survey is to aid in the determination of health and safety requirements during the conduct of work which may impact identified materials.

1.2. Site Description

The former school structure is currently utilized as a community center and consists of an approximately 19,176 square foot building reportedly constructed in 1930 with an addition added in 1990. The 1930s portion is situated over a crawlspace and a basement. Interior finishes includes plaster and gypsum board ceilings and walls, acoustical ceiling tiles, carpet, vinyl floor tile, brick veneer and concrete masonry unit (CMU) walls, among others. Building exterior includes brick veneer walls and concrete. Refer to Appendix B for site sketches of the facility, including asbestos sample locations.

Note that F&R utilizes a combination of cardinal directions and Housing and Urban Development methodology for location identification modifiers: Side A is always the address side or the main entry side of the building. Then, proceeding in a clockwise direction the adjacent sides are labeled B, C and D; for example, the wall on the left side as one enters the building would be denoted as side B. Rooms with similar use patterns are numbered sequentially, generally with the first being the one that is encountered as one moves clockwise through the building from the main entry; unless room numbers are clearly identified on-site or on provided architectural/mechanical drawings which are expected to persist throughout the project. Note that F&R utilized Hallway and Room numbers as they were labeled on-site; such designations are expected to persist throughout the project. Refer to Appendix B for facility sketches created by F&R based upon site conditions observed at the time this survey was conducted.

It should be noted that material and color descriptions are subjective and that, due to the nature of the environment, identical materials and colors may have been labeled as different depending on the lighting, other colors in the area, and other factors.

1.3. Background

F&R was provided with a previous survey report prepared by Barrata & Associates, Inc titled *Three Year AHERA Reinspection* dated March 4, 2008. As the previous report title indicates, the survey assessed portions of the structure for the purpose of compliance with existing Environmental Protection Agency (EPA) Asbestos Hazard Emergency Response Act (AHERA) requirements to perform a re-inspection every three years (triennial). An AHERA triennial is conducted in a limited capacity for asbestos and is instead focused on the condition of the ACM that has been verified from past surveys. As such, the provided previous survey was not sufficient to constitute a thorough building survey as required for renovation purposes with regard to applicable Federal and State regulations. Historic survey data has not been tabulated within this report; however, the aforementioned previous survey report is included for reference as Appendix C – Historical Documentation.

2.0 SCOPE OF SERVICES

As outlined in F&R proposal number 1962-00836-Revision I, the survey included the following services with respect to the proposed renovation activities:

- Identification and sampling, as necessary, of suspect ACMs.
- Testing, as necessary, of building components for the presence of lead-based paint.

3.0 LIMITED ASBESTOS-CONTAINING MATERIALS SURVEY

F&R's Virginia Licensed Asbestos Building Inspector, Jesse D. Phillips (Virginia Asbestos License #3303 003557), conducted the Asbestos Survey of the current site structure(s) located at 10148 Tinsley Lane on August 8, 2019. The noted Inspector was assisted by F&R industrial hygienist Adam Day.

Federal Regulations (40 CFR Part 61, Subpart M – National Emission Standard for Asbestos (NESHAP)), as well as Virginia Department of Labor and Industry regulations require a thorough asbestos inspection of the structure to be conducted prior to the commencement of renovation and/or demolition activities. An ACM is defined by the Occupational Safety & Health Administration (OSHA) and the Environmental Protection Agency (EPA) as material containing greater than one percent (1%) asbestos.

3.1. Asbestos-Containing Materials (ACM) Methodology

This survey was conducted in general accordance with the Federal NESHAP and applicable State regulations for the presence of ACMs. The survey was characterized by a visual inspection and sampling of suspect building components at the subject property to be impacted by the proposed renovation activities.

Guidelines utilized in the asbestos survey were established by the EPA, ASTM International (ASTM), and The Environmental Information Association, Inc. (EIA). Utilized guidelines included: the Asbestos Hazard Emergency Response Act (40 CFR Part 763, Subpart E – Asbestos-Containing Materials in Schools (cited as AHERA)), ASTM Standard E2356-14 *Standard Practice for Comprehensive Building Asbestos Surveys*, and the EIA publication *Managing Asbestos in Buildings: A Guide for Owners and Managers – A Revision to the United States Environmental Protection Agency's 1985 document Guidance for Controlling Asbestos-Containing Materials in Buildings (EPA 560/5-85-024) Known as the Purple Book*.

F&R's aforementioned industrial hygienist(s) collected and submitted suspect asbestos-containing bulk samples to the laboratory, of which, a total of seventy six (76) (1930s portion) and forty nine (49) (1990s portion) suspect asbestos-containing bulk samples with discernable layers were analyzed by the testing laboratory. Due to multiple layers, a total of one hundred twenty one (121) (1930s portion) and seventy three (73) (1990s portion) samples were analyzed.

Samples of suspect ACMs were organized as per the AHERA concept of Homogeneous Area (HA), collected, and transported to the Environmental Hazards Services, L.L.C. (EHS) testing laboratory. EHS is a National Institute for Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory (NVLAP Lab Code: 101882-0) and Virginia licensed asbestos laboratory, located in Richmond, Virginia, for analysis by Polarized Light Microscopy (PLM) following EPA Method 600/R-93/116. Refer to Appendix A for Laboratory Certificates of Accreditations. Refer to Appendix D for Laboratory Certificates of Analysis and Bulk Sample Chain of Custody Forms for further description of sampled materials/analytical results.

3.2. Asbestos-Containing Materials Findings

The following material types were identified, sampled, and accordingly homogenized based upon similar construction discovered during bulk sampling:

- Gypsum Board
- Acoustical Ceiling Panel
- Vinyl Cove Base
- Brick/Mortar and Grout
- Sound Absorption Board ("Tectum")
- Wood Tile Flooring
- Thermal System Insulation (TSI)/Jacketing
- Joint Compound
- 12 x 12 Vinyl Floor Tile
- Drywall/joint compound
- Various Caulking and Mastics
- HVAC Sealant
- CMU

The following table presents a summary of survey results from sampling events performed on August 8 and 12, 2019. Refer to Appendix B for illustration of the locations of collected bulk samples. Positive asbestos samples (samples containing detectable concentrations of asbestos) are in **BOLD** type.

3.2.1. 1930s Building

SUSPECT ASBESTOS-CONTAINING MATERIALS SAMPLE INFORMATION 1930 PORTION OF STRUCTURE

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
1	1930-1A	1	South West Exterior Corner	Red Brick	Red Cementitious; Homogeneous	NAD
	1930-1A			Mortar	Tan Granular; Homogeneous	NAD
	1930-1B		South East Exterior Corner	Red Brick	Red Cementitious; Homogeneous	NAD
	1930-1B			Mortar	Tan Granular; Homogeneous	NAD
2	1930-2A	1	Foundation – East Wall	Concrete	Gray/Beige Cementitious; Homogeneous	NAD
	1930-2B		South Face – East Of Main Entry	Concrete	Gray/Beige Cementitious; Homogeneous	NAD
3	1930-3A[4]	1	White Pliable – South Side Double Doors Exterior	White Door Caulking	White Paint-Like; White Pliable; Inhomogeneous	NAD
	1930-3B[4]		**South Door – West End – Former Exterior Side**	**Caulk I**	**Blue Paint-Like; Beige Soft Pliable-Like; Inhomogeneous**	**3% Chrysotile**
				Caulk II	**Gray Soft Pliable-Like; Homogeneous**	**3% Chrysotile**
4	**1930-4A**	1	**Classroom 2 – Exterior Window – West Side**	**Glazing**	**White Paint-Like; Tan Brittle; Inhomogeneous**	**2% Chrysotile**
	1930-4B		Classroom 3 – Exterior Window – South Side	Glazing	Gray/White Brittle; Homogeneous	NAD
5	1930-5A[4]	1	North Side – West Window Exterior	Caulk	White Pliable; Homogeneous	NAD
	1930-5B[4]		**South Side – West Window**	**Caulk I**	**White Pliable; Homogeneous**	**Trace <1% Chrysotile[5]**
	1930-5B[4]		**South Side – West Window**	**Caulk II**	**Gray Soft Pliable; Homogeneous**	**3% Chrysotile**

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
6	1930-6A	1	**2 Layer Plaster Ceiling – Workroom Floor (Damaged/Delaminated)**	Skim Coat	Beige Granular; Homogeneous	NAD
	1930-6A			**Base Coat**	**Gray Granular; Homogeneous**	**Trace <1% Chrysotile**
	1930-6B		**2 Layer Plaster Ceiling – Classroom 5 Floor (Damaged/Delaminated)**	Skim Coat	Blue Paint-Like; White Brittle; Inhomogeneous	NAD
	1930-6B			**Base Coat**	**Gray Granular; Homogeneous**	**Trace <1% Chrysotile**
	1930-6C		**2 Layer Plaster Ceiling – Principles Office**	Skim Coat	Beige Granular; Homogeneous	NAD
	1930-6C			**Base Coat**	**Gray Granular; Homogeneous**	**Trace <1% Chrysotile**
	1930-6D		**2 Layer Plaster Ceiling – Custodial Room 9**	Skim Coat	White Granular; Homogeneous	NAD
	1930-6D			**Base Coat**	**Gray Granular; Homogeneous**	**Trace <1% Chrysotile**
	1930-6E		2 Layer Plaster – Classroom 1	Joint Compound	White Paint-Like; White Powdery; Inhomogeneous	NAD
	1930-6E			Skim Coat	White Granular; Homogeneous	NAD
7	1930-7A	1	Hallway At Chimney Outside Classroom 1	Joint Compound	White Paint-Like; White Powdery; Inhomogeneous	NAD
	1930-7A			Gypsum Board	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
	1930-7B		Hallway At General Office	Joint Compound	White Paint-Like; White Powdery; Inhomogeneous	NAD
	1930-7B		Hall at General Office	Drywall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
	1930-7C		Hallway At Classroom 5	Joint Compound	White Paint-Like; White Powdery; Inhomogeneous	NAD
	1930-7C		Hallway at Classroom 5	Drywall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
8	1930-8A	1	Office 8 – At Sink	White Sink Backing	Off-White Adhesive-Like; Homogeneous	NAD
9	1930-9A	1	General Office	2' x 4' Ceiling Panel, pinhole with random fissures	White Paint-Like; Gray Fibrous; Inhomogeneous	NAD
	1930-9B		Room 7	2' x 4' Ceiling Panel, pinhole with random fissures	White Paint-Like; Gray Fibrous; Inhomogeneous	NAD
10	1930-10A	1	Foyer – South East Corner	2' x 4' Ceiling Panel, pinhole with random fissures	White Paint-Like; Gray Fibrous; Inhomogeneous	NAD
	1930-10B		Room 4 Center	2' x 4' Ceiling Panel, pinhole with random fissures	White Paint-Like; Gray Fibrous; Inhomogeneous	NAD
11	1930-11A	1	Foyer – East Side	2' x 4' Ceiling Panel, pinholes large and small	White Paint-Like; Gray Fibrous; Inhomogeneous	NAD
	1930-11B		Foyer – North Center	2' x 4' Ceiling Panel, pinholes large and small	White Paint-Like; Gray Fibrous; Inhomogeneous	NAD
12	1930-12A	1	Workroom – Office Suite (damaged/removed from wall and placed on floor)	Purple Cove Base	Purple Rubbery; Homogeneous	NAD
	1930-12A			Mastic	Yellow/Black Adhesive; Inhomogeneous	NAD
	1930-12B		Hallway At Door To Classroom 4	Purple Cove Base	Purple Rubbery; Homogeneous	NAD
	1930-12B			Mastic	White Adhesive; Homogeneous	NAD
13	1930-13A	1	Hallway at Room 9 At Columns	Plaster-Skim Coat	Beige Paint-Like; White Brittle; Inhomogeneous	NAD
	1930-13A		Hallway at Room 9 At Columns	Plaster-Base Coat	Gray Granular; Homogeneous	NAD
	1930-13B		Hallway at Room 2	Plaster-Skim Coat	White Paint-Like; White Brittle; Inhomogeneous	NAD

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
13	1930-13B	1	Hallway at Room 2	Plaster-Base Coat	Gray Granular; Homogeneous	NAD
	1930-13C		Door Between Hall And General Office	Plaster-Skim Coat	White Brittle; Homogeneous	NAD
	1930-13C			Plaster-Base Coat	Gray Granular; Homogeneous	NAD
	1930-13D		Classroom 4 – Demising Wall With Bell At Door	Plaster-Skim Coat	White Brittle; Gray	NAD
	1930-13D			Plaster-Base Coat	Gray Granular; Homogeneous	NAD
	1930-13E		Classroom 3 – Demising Wall With Bell At Door	Plaster-Skim Coat	White Brittle; Homogeneous	NAD
	1930-13E			Plaster-Base Coat	Gray Granular; Homogeneous	NAD
14	1930-14A	1	Room 8 At Door To Hall	Hollow Demising Wall	Brown Fibrous; Gray Chalky; Homogeneous	NAD
	1930-14B		Hallway At Workroom Exterior (Media Center)	Joint Compound	White Powdery; Homogeneous	NAD
	1930-14B			Drywall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
	1930-14C		Classroom 4 Opposite Door On Perimeter Wall Interior	Hollow Demising Wall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
	1930-14D		Classroom 2 – Perimeter Wall Interior – West Side South End	Hollow Demising Wall	White Powdery; Homogeneous	NAD
	1930-14D			Hollow Demising Wall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
15	1930-15A	**1**	Hallway Outside Office Suite	Plaster Demising Wall Skim Coat	White Granular; Homogeneous	NAD
	1930-15A		Hallway Outside Office Suite	Drywall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
	1930-15B		Hallway Outside Classroom 3	Joint Compound	White Granular; Homogeneous	NAD
	1930-15B		Hallway Outside Classroom 3	Drywall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
	1930-15C		**Classroom 3 Against Demising Wall With Classroom 4**	**Plaster Base Coat**	**White/Yellow/Green Paint-Like; Gray Cementitious; Inhomogeneous**	**Trace <1% Chrysotile[6]**
16	1930-16A	1	Room 8 – Southwest Corner Above Drop Ceiling	Joint Compound	White Powdery; Homogeneous	NAD
16	1930-16A	1	Media Room – East Wall At Convex Corner Of Computer Room Above Drop Ceiling	Drywall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
	1930-16B			Joint Compound	White Powdery; Homogeneous	NAD
	1930-16B			Drywall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
	1930-16C		Computer Room (6) – South Wall With Workroom Above Drop Ceiling	Joint Compound	White Powdery; Homogeneous	NAD
	1930-16C			Drywall	Brown Fibrous; Gray Chalky; Inhomogeneous	NAD
17	1930-17A	1	Room 8 – Above Drop Ceiling	Tan Duct Joint Sealant	Off-White Pliable; Homogeneous	NAD
	1930-17B		Computer Room (6) - Above Ceiling Drop	Tan Duct Joint Sealant	Off-White Pliable; Homogeneous	NAD
18	1930-18A	1	Room 8 – Above Drop Ceiling	Red Duct Joint Sealant	Maroon Pliable to Brittle; Homogeneous	NAD
	1930-18B		Room 6 - Above Ceiling Drop	Red Duct Joint Sealant	Beige to Brown Pliable to Brittle; Homogeneous	NAD

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
19	1930-19A	1	Wall Of Room 6 – South Side – Brown Wall	Bulletin Board Mastic	Brown Adhesive; Homogeneous	NAD
20	1930-20A	1	Computer Room (6) - Above Ceiling Drop	Black HVAC Damper	Black Vinyl-Like; Homogeneous	NAD
21	1930-21A	1	Computer Room (6) Ceiling	Ceiling Panel	Tan Fibrous; White Brittle; Inhomogeneous	NAD
	1930-21B		Computer Room (6) Ceiling	Ceiling Panel	Tan Fibrous; White Brittle; Inhomogeneous	NAD
22	1930-22A	1	Computer Room (6) – Perimeter Wall With Courtyard – Above Drop Ceiling	Insulation	Yellow Foam-Like; Silver Metallica; Translucent Adhesive; Inhomogeneous	NAD
23	1930-23A	1	**Computer Room (6) – East Floor/Wall**	Cove Base	Dark Blue Vinyl-Like; Homogeneous	NAD
	1930-23A			Mastic	Off-White Adhesive; Homogeneous	NAD
	1930-23A			**Joint Compound[7]**	**Off-White Brittle; Homogeneous**	**Trace <1% Chrysotile**
23	1930-23B	1	Computer Room (6) – West Floor/Wall	Cove Base	Blue Vinyl-Like; Homogeneous	NAD
	1930-23B			Mastic	Pale Yellow Adhesive; Homogeneous	NAD
24	1930-24A	1	Media Center – South East Corner – Under Carpet	Carpet Mastic	Yellow Adhesive; Homogeneous	NAD
	1930-24A			Carpet Mastic	Blue-Green Adhesive; Homogeneous	NAD
	1930-24B		Media Center – North West Corner	Carpet Mastic	Yellow Adhesive; Homogeneous	NAD
	1930-24B			Carpet Mastic	Blue-Green Adhesive; Homogeneous	NAD

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
25	1930-25A	1	Front Stairs In Foyer	Stair Tread – Maroon	Maroon Pliable; Homogeneous	NAD
	1930-25B			Stair Tread - Maroon	Maroon Pliable; Homogeneous	NAD
26	1930-26A	B	Basement/Boiler Room At Hollow Pipe Penetration Room A	Cardboard Pipe Housing	Tan Fibrous; White Brittle; Inhomogeneous	NAD
27	1930-27A	1	Foyer Stairs Area	Tan Tread Mastic	Yellow to Tan Pliable; Homogeneous	NAD
	1930-27B		Foyer Stairs Area	Tan Tread Mastic	Yellow to Tan Pliable; Homogeneous	NAD
28	1930-28A	1	Foyer Stairs Area	Red Vinyl Flooring	Red Granular; Homogeneous	NAD
	1930-28A			Lower Layer Mastic Beneath Flooring	Amber Adhesive; Homogeneous	NAD
	1930-28A			Upper Layer Mastic Beneath Flooring	Black Adhesive; Homogeneous	NAD
	1930-28B		Foyer Stairs Area	Red Vinyl Flooring	Red Granular; Homogeneous	NAD
	1930-28B			Mastic	Yellow Adhesive; Homogeneous	NAD
29	1930-29A	1	Foyer – Stairs Area	Flooring	White/Multi-Colored Granular; Homogeneous	NAD
	1930-29A			Mastic	Yellow to Amber Adhesive; Homogeneous	NAD
	1930-29B		Classroom 4 – North End By Closets	Flooring	White/Multi-Colored Granular; Homogeneous	NAD
	1930-29B			Mastic	Yellow to Amber Adhesive; Homogeneous	NAD

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
30	1930-30A	1	Center Of Room 4	Black Transition	Black Vinyl-Like; Homogeneous	NAD
	1930-30A			Mastic	Translucent to Pale Tan Adhesive; Homogeneous	NAD
	1930-30B		Door To Hall At Room 4	Black Transition	Black Vinyl-Like; Homogeneous	NAD
	1930-30B		Door To Hall At Room 4	Mastic	Translucent to Pale Tan Adhesive; Homogeneous	NAD
31*	1990 – 31A	1	Room 7 – Restroom With Shower, At Base Of Shower Face	White Caulk	Tan Pliable; Homogeneous	NAD
31*	1930-31A	1	Media Center	4" Cream Cove Base	Beige Vinyl-Like; Homogeneous	NAD
	1930-31A		Media Center	Mastic	Pale Yellow Adhesive; Homogeneous	NAD
	1930-31A		Media Center	Joint Compound	White Brittle; Homogeneous	NAD
*Second Homogenous Area 31 inadvertently duplicated in the field.						
32	1930-32A	B	Basement	½" TSI Covering/Jacket	White Pliable to Brittle; Pale Beige/Off-White Fibrous; Silver Metallic; Off-White Adhesive; Inhomogeneous	NAD
	1930-32A			½" TSI	Yellow Adhesive; Homogeneous	NAD
	1930-32B	1	Room 9	½" TSI Covering/Jacket	White Pliable to Brittle; Pale Beige/Off-White Fibrous; Silver Metallic; Off-White Adhesive; Inhomogeneous	NAD
			Room 9			
	1930-32B			½" TSI	Yellow Adhesive; Homogeneous	NAD

HA #	Sample #	Situation [1]	Sample Location(s)	Material Description	Laboratory Description	Result (Percent ACM)
33	1930-33A	B	Basement	2" TSI Covering/Jacket	White Pliable to Brittle; Pale Beige/Off-White Fibrous; Silver Metallic; Off-White Adhesive; Inhomogeneous	NAD
	1930-33A			2" TSI	Yellow Fibrous; Homogeneous	NAD
	1930-33B	1	Room 9	2" TSI Covering/Jacket	Pale Beige Brittle; Pale Beige/Off-White Fibrous; Silver Metallic; Off-White Adhesive; Inhomogeneous	NAD
	1930-33B			2" TSI	Yellow Fibrous; Homogeneous	NAD
34	1930-34A	B	Basement	Plaster Ceiling	Pale Gray Cementitious; White Brittle; Inhomogeneous	NAD
	1930-34B		Basement	Plaster Ceiling	Pale Gray Cementitious; White Brittle; Inhomogeneous	NAD
35	1930-35A	C	Crawl Space	Tar Paper	Black to Brown Fibrous; Homogeneous	NAD
36	1930-36A	C	Crawl Space	Insulation	Tan/Yellow Fibrous; Black Pliable; Inhomogeneous	NAD
37	1930-37A	C	Crawl Space	Wiring Jacket	Beige/Pale Silver/Tan Fibrous; Off-White/Black Vinyl-Like; Copper Tan Fibrous; White Brittle; Inhomogeneous	NAD

[1]Situation: 1 –First; B – Basement; C – Crawl Space; E – Exterior
[2]NAD: No Asbestos Detected
[3]**Bold**: Asbestos Containing Material or Trace (<1%) Asbestos Present
[4]Caulking with two separate caulk layers
[5]Lab Note: Possible contamination from caulk II
[6]Lab Note: <1% Chrysotile present in base coat
[7]Lab Note: Drywall System Joint Compound-Type Substrate Material

3.2.2. 1990s Building

SUSPECT ASBESTOS-CONTAINING MATERIALS SAMPLE INFORMATION 1990 PORTION OF STRUCTURE

HA #	Sample #	Sample Location(s)[1]	Material Description	Laboratory Description	Result (Percent ACM)
1 (visibly similar to HA 6/7, 21, & 25)	1990 -1A	Library – Electrical/ IT/ Storage Closet At Ceiling Access	Gypsum wallboard, Joint compound	Gray Powder; Brown Fibrous; Inhomogeneous	NAD
	1990 – 1A	Library – Electrical/IT/Storage Closet At Ceiling Access	Gypsum Wallboard, Joint Compound	White Granular; Homogeneous	NAD
	1990 – 1B	Storage HVAC Room – West Wall		Gray Powder; Brown Fibrous; Inhomogeneous	NAD
	1990 – 1C	Library – Electrical/IT/Storage Closet – North Wall At Door	Joint Compound	White Granular; Homogeneous	NAD
2	1990 – 2A	Library – Electrical/IT/Storage Closet Access In Ceiling (Partial Piece)	2’ x 4’ Ceiling Panel, Partial piece with pit and fissures	Brown Fibrous; White Paint; Inhomogeneous	NAD
	1990 – 2B	Eastern Breezeway	2’ x 4’ Ceiling Panel, Partial Piece with pit and fissures	Brown Fibrous; White Paint; Inhomogeneous	NAD
3	1990 – 3A	Library – Storage HVAC Room Floor	12 x 12 Floor Tile, Sea foam with cream, white, brown smears	Gray Vinyl; Homogeneous	NAD
	1990 – 3A	Library – Storage HVAC Room Floor	Black Mastic	Black Tar; Homogeneous	NAD
	1990 – 3B	Library – Storage HVAC Room Floor	12 x 12 Floor Tile, Sea foam with cream, white, brown smears	Gray Vinyl; Homogeneous	NAD
	1990 – 3B	Library – Storage HVAC Room Floor	Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
4	1990 – 4A	Library – Under Fountain	4” Cream cove base	Tan Vinyl; Homogeneous	NAD
	1990 – 4A		Black Mastic	Tan Adhesive; Homogeneous	NAD
5	1990 – 5A	Library – Under Multicolored Carpet Square, By Fountain	Yellow Mastic	Yellow Adhesive; Homogeneous	NAD
	1990 – 5B	Library – Under Multicolored Carpet Square, At Circulation Desk		Yellow Adhesive; Homogeneous	NAD

HA #	Sample #	Sample Location(s)[1]	Material Description	Laboratory Description	Result (Percent ACM)
6 (visibly similar to HA 1, 21, 25	1990 – 6A	Library; Children's Addition – East End Wall At Outlet	Joint Compound	White Granular; Homogeneous	NAD
	1990 – 6B	Library; Children's Addition – West Side Wall At North Outlet		White Granular; Homogeneous	NAD
7	1990 – 7A	Library; Children's Addition – West Side Wall At Outlet	Drywall	Gray Powder; Brown Fibrous; Gray Paint; Inhomogeneous	NAD
8	1990 – 8A	Library; Children's Additions – Wall/Brick Interior Face, South East Corner	White Caulk	White Pliable; Homogeneous	NAD
8	1990 – 8B	Library; Children's Addition – Wall/Brick Interior Face, South West Corner		White Pliable; Homogeneous	NAD
9	1990 – 9A	North East Exterior Wall, At Corner	Brick	Red Cementitious; Homogeneous	NAD
	1990 – 9A		Mortar	Brown Granular; Homogeneous	NAD
	1990 – 9B	South East Exterior Wall, At Corner	Brick	Red Cementitious; Homogeneous	NAD
	1990 – 9B		Mortar	Brown Granular; Homogeneous	NAD
10	1990 – 10A	North East Exterior Wall, At Corner	Block	Gray Cementitious; Homogeneous	NAD
	1990 – 10A		Mortar	Brown Granular; Homogeneous	NAD
	1990 – 10B	South East Exterior Wall, At Corner	Block	Gray Cementitious; Homogeneous	NAD
	1990 – 10B		Mortar	Brown Granular; Homogeneous	NAD
11	1990 – 11A	East Wall Exterior, At Brick Construction Joint	Black Caulk	Black Pliable; Homogeneous	NAD
	1990 – 11B	West Wall Of Interior Cafetorium, At Brick Construction Joint		Black Pliable; Homogeneous	NAD
12	1990 – 12A	Cafetorium Stage South Storage Closet, At HVAC Unit	Red HVAC Sealant	Brown Pliable; Homogeneous	NAD
13	1990 – 13A	Stairs By Stage South Storage Closet	Green Stair Tread	Green Vinyl; Homogeneous	NAD

HA #	Sample #	Sample Location(s)[1]	Material Description	Laboratory Description	Result (Percent ACM)
	1990 – 13A		Mastic	Tan Adhesive; Homogeneous	NAD
	1990 - 13B	Stage Stairs, By South Corner Of Stage	Green Stair Tread	Green Vinyl; Homogeneous	NAD
	1990 – 13B		Mastic	Tan/Black Adhesive; Inhomogeneous	NAD
14	1990 – 14A	Western Foyer/Breezeway, Facing Kitchen Entrance Door, Above Drop Ceiling Tile	TSI	Yellow Fibrous; Homogeneous	NAD
	1990 – 14A		TSI Covering/Jacket	White Pliable; Silver Foil; Inhomogeneous	NAD
15	1990 – 15A	Ducts Above Stage Access From Ladder	Tan Duct Sealant	Tan Pliable; Homogeneous	NAD
16	1990 – 16A	Cafetorium – North Side At Exit Door	Brown 4” Cove Base	Tan Vinyl; Homogeneous	NAD
	1990 – 16A		Mastic	Brown/Tan Adhesive; Homogeneous	NAD
	1990 – 16B	Cafetorium – East Side At HVAC Double Doors	Brown 4” Cove Base	Tan Vinyl; Homogenous	NAD
	1990 – 16B		Mastic	Tan Adhesive; Homogeneous	NAD
17	1990 – 17A	Kitchen – East Wall Cover Base Under Sink	Black Caulk Sealant	Black Pliable; Homogeneous	NAD
	1990 – 17B	Kitchen – North Wall At Tile Cover Base		Black Pliable; Homogeneous	NAD
18	1990 – 18A	Kitchen – North Wall At Water Heater	TSI	Yellow Fibrous; Homogeneous	NAD
	1990 – 18A		TSI Covering/Jacket	Tan Fibrous; Silver Foil; Inhomogeneous	NAD
	1990 – 18B		TSI	Yellow Fibrous; Homogeneous	NAD
	1990 – 18B		TSI Covering/Jacket	Tan Fibrous; Silver Foil; Inhomogeneous	NAD
19	1990 – 19A	Kitchen – Mop Closet At Base Of Mop Sink	Foam	Gray Foam; Homogeneous	NAD
	1990 – 19A		Caulk	Tan Pliable; Homogeneous	NAD
	1990 – 19B		Foam	Gray Foam; Homogeneous	NAD
	1990 – 19B		Caulk	Tan Pliable; Homogeneous	NAD

HA #	Sample #	Sample Location(s)[1]	Material Description	Laboratory Description	Result (Percent ACM)
20	1990 – 20A	Kitchen – North Wall At Base Of Exit Door, East Side Of Door	CMU Block	Gray Cementitious; Tan Paint; Inhomogeneous	NAD
	1990 – 20B	Kitchen – North Wall At Corner Of Water Heater Partition Wall		Gray Cementitious; Tan Paint; Inhomogeneous	NAD
21 (visibly similar to HA 1, 6/7, and 25)	1990 – 21A	Kitchen – Bathroom Ceiling	Gypsum Wall Board	Gray Powder; Brown Fibrous; Inhomogeneous	NAD
22	1990 – 22A	Cafetorium – North Wall At East Most Board	Sound Absorption Board	Tan Granular; Brown Fibrous; Inhomogeneous	NAD
	1990 -22B	Cafetorium – West Wall At Middle Most Board		Tan Granular; Brown Fibrous; Inhomogeneous	NAD
23	1990 – 23A	Men's Restroom – East Wall At Tile Cove Base Behind Door	Blue Ceramic Tile	Blue Cementitious; Homogeneous	NAD
	1990 – 23A		Grout	Gray Granular; Homogeneous	NAD
24	1990 – 24A	Kitchen – Cove Base At North Door Exit	Brown Ceramic Tile	Brown Cementitious; Homogeneous	NAD
	1990 – 24A		Grout	Brown Granular; Homogeneous	NAD
	1990 – 24A		Mastic	White Adhesive; Homogeneous	NAD
25 (visibly similar to HA 1, 6/7, & 21	1990 – 25A	Kitchen – Ceiling At Removable Ceiling Tile, On 2x4 Joint	Joint Compound	White Pliable; Homogeneous	NAD
26 (visibly similar to HA 27)	**1990 – 26A**	**West Side Double Doors Entrance, South Door**	**Black Window Glazing Compound**	**Black Pliable; Homogeneous**	**2% Chrysotile**
27 (visibly similar to HA 26)	1990 – 27A	West Side South Facing Double Doors, Entrance To Library, East Door	Black Window Glazing Compound	Black Pliable; Homogeneous	NAD

HA #	Sample #	Sample Location(s)[1]	Material Description	Laboratory Description	Result (Percent ACM)
28	1990 – 28A[4]	West Side Courtyard Double Doors, South Door	Clear Window Glazing Compound/Caulk	Black Pliable; Homogeneous	NAD
	1990 – 28A[4]			Clear Pliable; Homogeneous	NAD
29	1990 – 29A	Cafetorium – North Side Exit Door, At Door Transition	Wood Tile, Flooring	Brown Fibrous; Homogeneous	NAD
	1990 – 29A		Wood Tile, Mastic	Tan Adhesive; Homogeneous	NAD
30	1990 – 30A	Custodial Closet, Room 9, North Wall	Yellow Penetration Compound	Tan Pliable; Homogeneous	NAD
Homogenous Area 31 was omitted due to field error.					
32	1990 – 32A	Cafetorium – HVAC Closet On HVAC Unit	Silver Caulk	Yellow/Tan Granular; Homogeneous	NAD
33	1990 – 33A	Cafetorium – HVAC Closet At HVAC Unit Connection To South Wall	Yellow Mortar	Silver Pliable; Homogeneous	NAD
34	1990 – 34A	East Side Double Doors Exterior At Breezeway	White Door Caulk	White Pliable; Homogeneous	NAD

[1]All samples collected from fist floor (single story building)
[2]NAD: No Asbestos Detected
[3]**Bold**: Asbestos Containing Material or Trace (<1%) Asbestos Present
[4]Caulking with two separate caulk layers

3.3. Asbestos-Containing Materials Inventory

F&R conducted a survey of the reasonably and safely accessible portions of the building. The Workroom in the Media Center was inaccessible during the site visit; suspect ACM in this space which were not represented during this survey should be presumed positive.

The following table presents identified materials containing greater than 1% asbestos, as well as presumed materials with regard to F&R survey activities and verified information obtained from Owner provided previous reports. Further, comprehensive delineation was not performed; therefore, the table below may not completely represent locations of identified ACMs. It is the responsibility of the client or contractor to verify material locations. Photographic documentation of ACMs for reference is provided as Appendix E.

ASBESTOS-CONTAINING MATERIALS INVENTORY 1930s PORTION

HA #	Material Description	Material Location(s)	Result (Percent ACM)
3	Caulk	South Door – East End – Former Exterior Side	3% Chrysotile
4	Glazing	Classroom 2 – Exterior Window West Side	2% Chrysotile

ASBESTOS-CONTAINING MATERIALS INVENTORY 1990s PORTION

HA #	Material Description	Material Location(s)	Result (Percent ACM)
26	Black Window Glazing Compound	West Side Double Doors Entrance, South Door	2% Chrysotile

F&R presumes that, where materials have been documented to be ACMs and where those materials are similar to other materials which have not been found to be positive, those similar materials will be considered to be ACMs (i.e. where one material was analyzed and found to be positive, it is prudent to consider other similar materials positive, despite potential analytical data to the contrary).

3.3.1. Trace Asbestos

A total of seven (7) building materials were detected in the 1930s portion for which analytical results indicated the presence of asbestos but in a quantity less than 1%, reported by the lab as trace. Representative samples are shown in the table below:

TRACE-ASBESTOS-BUILDING MATERIALS (TRACE <1%) INVENTORY

HA #	Material Description	Material Location(s)	Result (Percent Asbestos)
5	Caulk[1]	South Side Exterior – West Window	<1% Chrysotile
6	Base Coat	Workroom Ceiling - On Floor (Damaged)	<1% Chrysotile
6	Base Coat	Classroom 5 Ceiling - On Floor (Damaged)	<1% Chrysotile
6	Base Coat	Principles Office Ceiling	<1% Chrysotile
6	Base Coat	Classroom 1 Ceiling	<1% Chrysotile
15	Plaster Wall[2]	Classroom 3 Against Demising Wall with Classroom 4 – In Closet	<1% Chrysotile
23	Joint Compound[3]	Room 6 – East Floor/Wall	<1% Chrysotile

[1]Lab Note: Possible contamination from caulk II
[2]Lab Note: <1% Chrysotile Present in the Base Coat
[3]Lab Note: Drywall System Joint Compound-Type Substrate Material

Trace levels of asbestos were identified in window caulking, the base coating of the plaster ceilings, one plaster finished wall (specifically in the base coat), and the joint compound in the gypsum wallboard system. Based on the laboratory analysis, it can be assumed that areas with similar homogeneous materials may also contain trace levels of asbestos. This includes rooms with similar plaster ceilings, plaster wall finishes, and window caulks.

Although this concentration of asbestos is below the regulatory threshold under EPA regulations, and additionally does not constitute ACM as per OSHA regulations, OSHA has regulations that apply to the removal and disturbance of trace levels of asbestos. F&R recommends that the owner either conduct follow-up sampling of the base coat using a more sensitive method (TEM analysis) to evaluate if there is asbestos present in this material or assume that the material is asbestos containing and manage it accordingly. F&R notes, however, that this is not a regulatory requirement and our recommendation is based on experience and good practice.

3.3.2. Presumed Asbestos-Containing Materials

During the conduct of this survey, sampling was limited to those materials which were within the areas designated by the client, which were safely accessible, and which were able to be sampled without damaging systems or structures. As such, some materials should be presumed to be positive, unless sampling is conducted and shown to be negative. Such presumed asbestos containing materials (PACMs) include, but are not limited to:

- Materials within the space above the drop ceilings;
- Materials within wall cavities or above hard ceilings;
- Fire door interiors,
- Gaskets and packing materials in plumbing, where present,
- Chimneys and flues or other cementitious pipes or panels,
- Internal Components within the HVAC units,
- Electrical Components,
- Etc.

Note that asbestos was used in over 3,000 known products and was used extensively in construction materials including in insulation and finish materials such as drywall-based systems, acoustical tiles, caulks and mastics, vinyl-based materials, and specialty products. Asbestos also continues to be used in new construction because, as stated by the EPA, "the manufacture, importation, processing, and distribution in commerce of [various] products […] are not banned."

3.4. Asbestos-Containing Materials Recommendations

As detailed above, several materials were identified as asbestos-containing, utilized in window glazing and door caulking throughout the structure. Prior to impacting the identified or presumed ACMs via renovation and/or demolition, F&R recommends that the ACMs be appropriately

removed, handled, and disposed of by an appropriately licensed/accredited Abatement Contractor utilizing appropriately licensed/accredited personnel. Best practices dictate that an asbestos abatement specification document be prepared which details project-specific work plans and requirements. This abatement specification document should incorporate delineation of identified or presumed ACMs and should be furnished by the client or building owner to contractors for bidding purposes. Appropriately licensed or accredited personnel must prepare and/or review such specification documents. This survey report should not be used for bidding purposes.

A quantity of trace asbestos was reported by the testing laboratory for certain building materials and was determined to be present in window caulking, base coat in plaster finished ceilings, and plaster wall components including plaster base coat and joint compound. F&R recommends that the client consider proactive removal of the damaged trace ACMs in various areas in the structure including; General Office, Principle Office, Workroom, Classroom 5, and anywhere else it is present in the building. F&R recommends that rooms containing any damaged plaster ceiling materials be closed to pedestrian traffic and not be occupied until said materials are disposed of appropriately. Although EPA regulations do not require the disposal of trace (<1%) asbestos building materials to be treated as asbestos containing, OSHA regulations still apply to trace (<1%) building materials when engaging in renovation/demolition activities. Additionally, any further renovation/demolition activities which would damage or disturb the plaster wall systems or plaster ceilings should also be handled appropriately. F&R also recommends further sampling and delineation of all apparently homogeneous wall systems where asbestos was detected in any concentration.

With regard to the facility in terms of asbestos abatement activities, F&R recommends that a third party Asbestos Professional be retained to provide on-site surveillance and guidance of the Asbestos Abatement Contractor to confirm complete and proper removal/disposal of ACMs in accordance with applicable federal, state, and local regulations.

F&R further recommends that the third party Asbestos Professional be present for the duration of the abatement project and authorized to provide guidance to the Asbestos Abatement Contractor during the Project to confirm complete and proper removal/disposal of ACMs in accordance with applicable federal, state, and local regulations. This recommendation is made as a best practice to reduce potential exposure to workers and limit liability.

The Client should note that F&R has encountered instances in which materials were analyzed by Polarized Light Microscopy (PLM) (following EPA Method 600/R-93/116) for the presence of asbestos with a result of “None Detected”, but when analyzed by Transmission Electron Microscopy (TEM) for Non-friable Organically Bound (NOB) bulk material, analytical results have indicated that asbestos is present in quantities greater than 1%. The client should be aware that F&R has samples analyzed by the PLM method for a number of reasons (including financial and time considerations) and that this method is considered acceptable in the State of Virginia;

however, some firms employ the more stringent TEM method which is required in some states. Therefore, it is possible that some materials identified as containing no asbestos within this report may, if subjected to a more stringent analytical method, reveal the presence of asbestos at concentrations of 1% or greater.

In addition, it should be noted that through NESHAP Applicability Determinations, asbestos bulk samples analyzed via PLM which indicate a result of asbestos content to be less than ten (10) percent, including trace amounts (<1%), the material in question shall either be assumed to be an ACM or further analyzed via PLM Point Count or TEM to verify asbestos content. Results obtained via PLM Point Count or TEM analysis shall supersede previous results obtained by standard PLM analysis. Samples with analytical results via PLM which indicate that no asbestos was detected are not required to be further analyzed via PLM Point Count or TEM. Note that the sampled materials where trace concentrations were detected should therefore be considered ACM (>1%) until more stringent analysis is performed.

Should additional suspect ACMs be discovered during renovation activities that have not been sampled and will be disturbed, F&R recommends the work be temporarily halted. Samples of suspect materials should be collected, analyzed, and handled accordingly prior to the resumption of renovation and/or demolition activities.

3.5. Applicable Regulations

3.5.1. EPA/NESHAP Regulations for Asbestos-Containing Materials

The U.S. Environmental Protection Agency promulgated the National Emission Standards for Hazardous Air Pollutants (NESHAP) [40 CFR Part 61], which addresses the application, removal, and disposal of asbestos-containing materials (ACM). Under NESHAP the following categories are defined for asbestos-containing materials:

Friable - When dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Non-friable - When dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Category I Non-friable ACM - Packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1% asbestos.

Category II Non-friable ACM – Material, excluding Category I Non-friable ACM, which contains more than 1% asbestos.

Regulated Asbestos Containing Material (RACM) – One of the following:

1. Friable ACM
2. Category I Non-friable ACM that has become friable.
3. Category I Non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading.
4. Category II Non-friable ACM that has a high probability of becoming, or has become, friable by the forces expected to act on the material in the course of demolition or renovation operations.

Under NESHAP, the following actions are required:

1. Prior to the commencement of demolition or renovation activities, the building owner must inspect the affected facility or part of the facility where the demolition or renovation activities will occur for the presence of asbestos.

2. Remove RACM from the facility before activities begin that would break up, dislodge, or similarly disturb the material or preclude access for subsequent removal.

3. ACM need not be removed if:

   a) It is Category I non-friable ACM that is not in poor condition.
   b) It is on a facility component that is encased in concrete or other similar material and is adequately wet whenever exposed.
   c) It was not accessible for testing and was therefore not discovered until after demolition began and because of the demolition the material cannot be safely removed.
   d) It is Category II non-friable ACM and the probability is low that the material will become crumbled, pulverized, or reduced to powder during demolition.

3.5.2. Virginia Asbestos Regulations

The Virginia Department of Labor and Industry (DOLI) regulates asbestos through enforcement of the Virginia Occupational Safety and Health (VOSH) regulations, enforcement of the Environmental Protection Agency's National Emission Standards for Hazardous Air Pollutants (NESHAP), and enforcement of the Asbestos Notification regulations found in the Labor Laws of Virginia (§40.1-51.20). Agency locations and regulations can be found on the agency Web site http://www.doli.virginia.gov.

The Virginia Department of Professional and Occupational Regulation (DPOR) is responsible for company and individual licensure in Virginia. Licensure and regulatory information can be found on DPOR's Web site http://www.dpor.virginia.gov/

The Virginia Department of Environmental Quality (DEQ) is responsible for the regulation of landfills in Virginia. Information on the disposal of asbestos in Virginia landfills can be obtained from the DEQ Web site http://www.deq.state.va.us/.

3.5.3. OSHA Asbestos Regulations

The Occupational Safety and Health Administration (OSHA) regulates employee exposure to asbestos under 29 CFR 1926.1101 and 29 CFR 1910.1001. Work associated with known or suspect ACMs must be conducted according to these regulations in addition to the noted EPA regulations. As discussed previously, OSHA has certain regulatory requirements for working with building materials where asbestos has been detected in a quantity of 1% or less.

4.0 LIMITED LEAD-BASED PAINT SURVEY

F&R's Virginia Licensed Lead-Based Paint Risk Assessor, Jesse D. Phillips (VA LBP License #3356 001002), performed the testing of surface coatings for lead on August 12, 2019. Refer to Appendix A for F&R Personnel Accreditation Documentation.

For definitions of terms used in this document with regard to Lead-Based Paint, please reference the Glossary of the U.S. Department of Housing and Urban Development (HUD) Guidelines for the Evaluation and Control of Lead-Based paint Hazards in Housing (Second Edition, July 2012).

Based on the nature of this survey, when one component tests positive for the presence of lead similar painted/coated components shall be assumed to be lead-containing, unless additional testing is performed.

4.1. Lead-Based Paint Survey Methodology

The survey was conducted in general accordance with EPA's work practice standards for conducting LBP activities (40 CFR 745.227), and the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (Second Edition, July 2012); however, this was not a comprehensive surface-by-surface investigation for LBP, but rather a screening survey of major coated surfaces where the presence of LBP is suspected.

4.1.1. XRF Testing

Sampling of surface coatings was conducted utilizing a Heuresis Pb200i X-Ray Fluorescence (XRF) Lead Paint Analyzer (Serial Number 1504) (VA)). Only accessible painted, coated, and/or varnished surfaces were tested using the XRF.

The XRF contains a small radioisotopic source and operates on the principle of x-ray fluorescence, whereby lead atoms in a surface coating are stimulated to emit characteristic x-rays, which are

then detected by the instrument. Levels of lead are reported in units of milligrams per square centimeter (mg/cm^2). The XRF can measure surface or non-surface concentrations of lead with 95% accuracy at the HUD action level of 1.0 mg/cm^2. The XRF is able to accurately detect a concentration as low as 0.1 mg/cm^2 of lead. The XRF classifies coated surfaces as "positive", "negative", or "null" for lead content based on the action level (1.0 mg/cm^2) and the performance characteristics of the XRF. The XRF was checked for calibration before and after the survey. The calibration was checked against a standard reference material (1.04 mg/cm^2 NIST Standard) supplied by the XRF manufacturer. A copy of the XRF Performance Characteristic sheet is included as an attachment to this report.

Positive: Lead is present at or above the action level of 1.0 mg/cm^2 on *one or more* of the components tested.

Negative: Lead is not present at or above the action level of 1.0 mg/cm^2 on any of the components tested.

Null: Insufficient data was collected by the XRF during the sample time to determine if the surface is positive or negative (i.e. – premature removal or instrument slippage, terminating the test).

4.2. Lead-Based Paint Survey Findings

4.2.1. XRF Survey Results

A total of two-hundred-sixty-five (265) XRF readings, excluding calibration readings, were collected from the interior and exterior of the building. Thirty-one (31) of the readings collected at the Project site were positive for LBP when compared to the action level of 1.0 mg/cm^2. Note that all positive readings were collected from the 1930s building; LBP was not identified in the 1990s building. Refer to Appendix F, XRF Data Table for a listing of the readings and respective information as well as an explanation of the data table and the Performance Characteristic Sheet. The following table presents the positive readings collected.

XRF READINGS FOR LEAD-BASED PAINT

Reading Number	Component	Substrate	Side	Color	Floor	Room	Build Date
34	Door Casing	Wood	North	Blue	First	West Foyer	1930
35	Door Transom	Wood	North	Blue	First	West Foyer	1930
36	Window Sill	Concrete	West	White	First	Exterior	1930
37	Window Mullion	Metal	South	White	First	Exterior	1930
39	Door Casing	Wood	South	White	First	Exterior	1930

Reading Number	Component	Substrate	Side	Color	Floor	Room	Build Date
42	Wall – White Masonry Detail	Concrete	North	White	First	Exterior	1930
45	Window Well	Wood	West	White	First	Exterior	1930
48	Window Sash	Wood	West	White	First	Exterior	1930
49	Window Casing	Wood	West	White	First	Exterior	1930
54	Chair Rail – replacement piece	Wood	South	Blue	First	1	1930
79	Bulletin Board Above Chalkboard	Cork	West	White	First	3	1930
80	Bulletin Board Above Chalkboard	Cork	North	White	First	3	1930
93	Window Parting Bead	Wood	East	White	First – Exterior side	4	1930
125	Window Sash	Wood	North	Blue	First	6	1930
127	Window Sash	Wood	North	Blue	First	6	1930
129	Window Sash	Wood	North	Blue	First	Media Center	1930
131	Window Sash	Wood	North	Blue	First	Media Center	1930
136	Door Mullion	Wood	North	Blue	First	East Hallway	1930
159	Window Sash	Wood	North	Blue	First	8	1930
160	Window Sash	Wood	North	Blue	First	8	1930
177	Fascia	Wood	North	White	Stairwell	Boiler/Mech/Utility	1930
178	Roof Top	Metal	North	Red	Stairwell	Boiler/Mech/Utility	1930
179	Wall	Concrete	North	White	Basement – Room B	Boiler/Mech/Utility	1930
180	Wall	Concrete	North	White	Basement – Room B	Boiler/Mech/Utility	1930
181	Wall	Concrete	South	White	Basement – Room B	Boiler/Mech/Utility	1930
190	Door	Wood	West	White	Basement – Room A	Boiler/Mech/Utility	1930
195	Wall	Concrete	East	White	Basement – Room A	Boiler/Mech/Utility	1930
199	Wall	Concrete	East	White	Basement – Stairwell	Boiler/Mech/Utility	1930
246	Roof Top	Metal	N/A	Red	Exterior	Red Flashing “awning” at breezeway	1990

Reading Number	Component	Substrate	Side	Color	Floor	Room	Build Date
251	Fascia	Wood	N/A	White	Exterior	Original Gym Roof Perimeter	1930
257	Vent	Metal	N/A	White	Exterior	Original Gym Roof Perimeter	1930

Data collected during the survey was extrapolated to similar homogeneous areas. As such, painted materials sharing similar color and texture with LBP components on the above table should be presumed positive for lead.

Note that the exterior portions of the windows should be presumed positive based on the results; interior portions of perimeter windows were found to be LBP-coated on the north facing walls only. However, for the purposes of this survey, since the exterior portions were also found to be LBP coated, the entire window should be treated as having been coated with LBP.

4.3. Inaccessible or Presumed Lead-Based Paint

During the conduct of this survey, testing was limited to those materials which were safely accessible and did not require invasive sampling. As such, some materials should be presumed to be positive, unless sampling is conducted and shown to be negative. Such presumed LBP coated components include, but are not limited to:

- Painted components within the space above the drop ceilings;
- The interior of wall cavities or above hard ceilings.

4.4. Lead-Based Paint Conclusions & Recommendations

This survey concludes that building components located on both the exterior and interior of the structure contain lead-based paint/coatings. Photographic documentation of select lead-containing paint/coatings on building materials is presented in Appendix E: Section 2.

F&R recommends that activities which may disturb such coatings be conducted following appropriate Federal and State regulations. Federal regulations with regard to worker safety and disposal requirements are summarized in the following Section – Applicable Regulations; this is not an exhaustive list.

Should additional suspect LBP coated components be discovered during renovation and/or demolition activities that have not been evaluated but will be disturbed, F&R recommends work be temporarily halted. Samples of suspect materials should be evaluated and handled accordingly prior to the resumption of renovation and/or demolition activities.

In addition to the above, F&R recommends that routine maintenance of the building be conducted to prevent or reduce risk associated with extant lead based paint. These measures should correspond to Chapter 6 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (Second Edition, July 2012)* which notes the following components of ongoing lead-safe maintenance:

- Periodic Visual Assessments
- Correction of problems found in the visual assessments
- Using lead-safe work practices
- Conducting a clearance examination

4.5. Applicable Regulations

4.5.1. OSHA Regulations for Lead-Based Paint

While the majority of materials tested at the site were negative for lead based paint and/or surface coatings, other painted and/or coated surfaces or materials containing lead may contain sufficient concentrations of lead, which when disturbed, may generate lead dust greater than the "Action Level" concentration of 30 micrograms per cubic meter ($\mu g/m^3$) or greater than the "Permissible Exposure Limit" of 50 micrograms per cubic meter established by the OSHA "Lead Exposure in Construction Rule" (29 CFR 1926.62). The OSHA standard does not define acceptable levels of lead in paint at which no exposure to airborne lead (above the action level) would be expected; however, guidance is available for work practices which present the highest risk for lead exposure to workers. Rather, OSHA defines airborne concentrations and references specific types of work practices and operations from which a lead hazard may be generated (reference 29 CFR 1926.62, section d). Environmental and personnel monitoring should be conducted during removal or demolition processes (as applicable) to determine actual personal exposure. This monitoring information can be used to determine the levels of personnel protection and environmental controls required for work involving specific removal/demolition processes on specific structures. Under OSHA requirements, the Contractor performing the work will be required to conduct this monitoring. It is important to note that environmental controls will vary dependent upon the content of lead in paint, the process used to remove it, duration of the work, and the amount of paint to be removed.

F&R recommends that workers disturbing painted (or coated) surfaces as part of this project receive OSHA Lead in Construction Awareness training and that engineering controls and hygiene practices described in 29 CFR 1926.62 be followed during the disturbance of painted (or coated) surfaces.

4.5.2. EPA Regulations for Lead-Based Paint

For disposal of construction/demolition debris that has LBP, testing may be required as specified by the Environmental Protection Agency (EPA) for lead content to determine proper disposal. EPA regulations require that a generator of waste determine if that waste is hazardous by performing testing in accordance with the requirements of 40 CFR 261.11 or for wastes that may be RCRA hazardous (such as items with high lead content), the generator may assume that the waste is hazardous and comply with the hazardous waste regulation. The need for determination of disposal may be additionally subject to the disposal and/or recycling facility utilized.

If the facility will be occupied by children in a manner that would qualify the facility as "child occupied" under the US EPA RRP regulations found under 40 CFR 745, the Renovation, Repair, and Painting (RRP) Regulation would apply. In that case, if renovation work is completed at the facility, under, any Contractor shall complete all renovation work that will affect LBP coated surfaces in accordance with the requirements found in 40 CFR 745. The Contractor would be required to submit documentation of compliance with this standard to the Client prior to start-up of work, including personal training, certification of personal, and a means and methods work plan to comply with the RRP regulations.

5.0 LIMITATIONS

This report has been prepared for the exclusive use of the County of Roanoke and/or their agents. This service was performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. Conclusions and recommendations are based, in part, upon information provided to us by others and site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Observations and recommendations are based upon conditions readily visible at the site at the time of the site visit, and upon current industry standards.

During this study, suspect asbestos samples were submitted for analysis at a NVLAP-accredited laboratory via polarized light microscopy; suspect LBP was field characterized using industry standard methods and practices. Inaccessible areas, such as behind solid ceilings or behind solid walls were not surveyed; therefore, some target materials may not have been identified. As with similar surveys of this nature, actual conditions exist only at the precise locations from which samples were collected or tested. Areas inspected were limited to those designated by the scope of services by the Client. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. Unless otherwise noted, F&R does not claim to have performed exhaustive delineation and/or quantification of identified materials; it is the responsibility of the client or abatement contractor to verify locations and quantities of regulated materials. It is also understood that this is a non-invasive survey so that it is possible that concealed materials may be present that were not accessible during the original survey. No other warranty, expressed or

implied, is made. Reasonable effort was made by inspection personnel to locate and sample suspect materials within the structure with regard to the scope of services. However, for a facility, the existence of unique or concealed ACMs or LBP and debris is a possibility. F&R does not warrant, guarantee or profess to have the ability to locate or identify all ACMs, LBP, or other chemicals of concern in a facility.

Under this scope of services, F&R assumes no responsibility regarding response actions (e.g. O&M Plans, Encapsulation, Abatement, Removal, Tenant Notification, etc.) initiated as a result of these findings. F&R assumes no liability for the duties and responsibilities of the Client with respect to compliance with appropriate regulations. Compliance with regulations and response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements and should be performed by appropriately qualified and licensed/accredited personnel, as warranted.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to local, state, or federal public agencies conditions at the site that may present a potential danger to public health, safety, or the environment. The Client agrees to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, information that may be necessary to prevent danger to public health, safety, or the environment. The contents of the report should not be construed in any way as a recommendation to purchase, sell, or develop the project site. F&R retains the right to revise this report if new information is later discovered or made available. The report must be presented in its entirety.

Appendix F

Explanation of XRF Data Table
XRF Data Table
XRF Performance Characteristic Sheet

EXPLANATION OF XRF DATA TABLES for HEURESIS

Column	Description
Reading No	Sample numbers.
Date & Time	Date and Time of the reading.
Concentration	XRF reading of lead level (in milligrams per square centimeter (mg/cm^2).
Units	Unit of measure that the XRF uses to report readings: mg/cm^2.
Result	Result of the reading: NEG = negative POS = positive
Site	Location of the Project.
Floor	Building Floor the reading was collected on.
Room	Identified Room on the corresponding Floor.
Side	Side within the corresponding Room where the specific reading was collected.
Substrate	The type of material underlying the paint or coating.
Component	Structural or design element the reading was collected from.
Color	Color of the coated surface.

System Info

Company	Heuresis Corp.
Model	Pb200i
Type	XRF Lead Paint Analyzer
Serial Num.	1504
Software Ver.	3.0.11

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Side	Substrate	Color	Room	Built Date	Floor	Project	Inspector
1	*1.2*	*mg/cm2*	*0.2*	*Positive*	*8/12/2019 9:18*	*Calibration*							*Bent Mountain*	*Jesse Phillips*
2	*1.1*	*mg/cm2*	*0.2*	*Positive*	*8/12/2019 9:19*	*Calibration*							*Bent Mountain*	*Jesse Phillips*
3	*1.2*	*mg/cm2*	*0.2*	*Positive*	*8/12/2019 9:19*	*Calibration*							*Bent Mountain*	*Jesse Phillips*
4	0.1	mg/cm2	0.4	Negative	8/12/2019 9:22	Wall	North	Gypsum Board	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
5	0.2	mg/cm2	0.4	Negative	8/12/2019 9:23	Wall	West	Gypsum Board	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
6	0.1	mg/cm2	0.4	Negative	8/12/2019 9:25	Wall	East	Gypsum Board	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
7	0.2	mg/cm2	0.4	Negative	8/12/2019 9:25	Wall	East	Gypsum Board	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
8	0.1	mg/cm2	0.4	Negative	8/12/2019 9:26	Wall	South	Gypsum Board	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
9	0.1	mg/cm2	0.4	Negative	8/12/2019 9:26	Ceiling	South	Gypsum Board	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
10	-0.2	mg/cm2	0.5	Negative	8/12/2019 9:27	Wall	East	CMU	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
11	-0.1	mg/cm2	0.4	Negative	8/12/2019 9:28	Door Casing	South	Wood	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
12	0.1	mg/cm2	0.5	Negative	8/12/2019 9:28	Door	South	Metal	Red	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
13	-0.1	mg/cm2	0.4	Negative	8/12/2019 9:29	Door	South	Wood	Varnish/Stain	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
14	0.2	mg/cm2	0.5	Negative	8/12/2019 9:30	Door Casing	South	Metal	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
15	-0.2	mg/cm2	0.4	Negative	8/12/2019 9:31	Shelf	East	Wood	Varnish/Stain	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
16	0	mg/cm2	0.5	Negative	8/12/2019 9:31	Shelf	North	Metal	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
17	0.1	mg/cm2	0.4	Negative	8/12/2019 9:32	Ceiling	N/A	Gypsum Board	White	Library Bathroom	1990+	First	Bent Mountain	Jesse Phillips
18	0.1	mg/cm2	0.5	Negative	8/12/2019 9:33	Wall	North	Gypsum Board	Beige	Library Bathroom	1990+	First	Bent Mountain	Jesse Phillips
19	0.1	mg/cm2	0.4	Negative	8/12/2019 9:34	Wall	North	Gypsum Board	Beige	Library IT Closet	1990+	First	Bent Mountain	Jesse Phillips
20	-0.1	mg/cm2	0.5	Negative	8/12/2019 9:34	Wall	East	CMU	Beige	Library IT Closet	1990+	First	Bent Mountain	Jesse Phillips
21	0.1	mg/cm2	0.4	Negative	8/12/2019 9:36	Wall	West	Gypsum Board	Beige	Library - Childrens Area	1990+	First	Bent Mountain	Jesse Phillips
22	0.1	mg/cm2	0.4	Negative	8/12/2019 9:36	Wall	North	Gypsum Board	Beige	Library - Childrens Area	1990+	First	Bent Mountain	Jesse Phillips
23	0.1	mg/cm2	0.5	Negative	8/12/2019 9:36	Door Casing	East	Wood	Beige	Library - Childrens Area	1990+	First	Bent Mountain	Jesse Phillips
24	0.1	mg/cm2	0.4	Negative	8/12/2019 9:37	Window Casing	West	Wood	Beige	Library - Childrens Area	1990+	First	Bent Mountain	Jesse Phillips
25	0	mg/cm2	0.4	Negative	8/12/2019 9:38	Window Sill	South	Wood	Beige	Library - Childrens Area	1990+	First	Bent Mountain	Jesse Phillips
26	0	mg/cm2	0.5	Negative	8/12/2019 9:38	Window Casing	South	Wood	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
27	0.1	mg/cm2	0.4	Negative	8/12/2019 9:39	Window Sill	South	Wood	Beige	Library - Main	1990+	First	Bent Mountain	Jesse Phillips
28	-0.1	mg/cm2	0.4	Negative	8/12/2019 9:41	Window Casing	South	Wood	White	Library Exterior	1990+	First	Bent Mountain	Jesse Phillips
29	0	mg/cm2	0.4	Negative	8/12/2019 9:41	Window Sill	South	Wood	White	Library Exterior	1990+	First	Bent Mountain	Jesse Phillips
30	0.1	mg/cm2	0.5	Negative	8/12/2019 9:42	Door	South	Metal	Red	Library Exterior	1990+	First	Bent Mountain	Jesse Phillips
31	-0.1	mg/cm2	0.4	Negative	8/12/2019 9:42	Door Casing	South	Wood	White	Library Exterior	1990+	First	Bent Mountain	Jesse Phillips
32	0.2	mg/cm2	0.4	Negative	8/12/2019 9:43	Window Casing	South	Metal	White	Library Exterior	1990+	First	Bent Mountain	Jesse Phillips
33	-0.1	mg/cm2	0.4	Negative	8/12/2019 9:44	Gutter Downspout	North	Metal	White	Library Exterior	1990+	First	Bent Mountain	Jesse Phillips
34	*8.5*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 9:50*	*Door Casing*	*North*	*Wood*	*Blue*	*West Foyer*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
35	*10.9*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 9:52*	*Door Transom*	*North*	*Wood*	*Blue*	*West Foyer*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
36	*12.1*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 9:54*	*Window Sill*	*West*	*Concrete*	*White*	*Exterior*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
37	*2*	*mg/cm2*	*0.4*	*Positive*	*8/12/2019 9:56*	*Window Mullion*	*South*	*Metal*	*White*	*Exterior*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
38	0.2	mg/cm2	0.4	Negative	8/12/2019 9:56	Window Well	South	Metal	White	Exterior	1930	First	Bent Mountain	Jesse Phillips
39	*8.7*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 9:57*	*Door Casing*	*South*	*Wood*	*White*	*Exterior*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
40	-0.1	mg/cm2	0.4	Negative	8/12/2019 9:58	Door	South	Wood	Red	Exterior	1930	First	Bent Mountain	Jesse Phillips
41	0.1	mg/cm2	0.4	Negative	8/12/2019 9:58	Door	South	Wood	Red	Exterior	1930	First	Bent Mountain	Jesse Phillips
42	*6.4*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 10:00*	*Wall - White Masonry Detail*	*North*	*Concrete*	*White*	*Exterior*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
43	0.9	mg/cm2	0.3	NULL	8/12/2019 10:03	Window Well	West	Wood	White	Exterior	1930	First	Bent Mountain	Jesse Phillips
44	0.6	mg/cm2	0.2	Negative	8/12/2019 10:03	Window Well	West	Wood	White	Exterior	1930	First	Bent Mountain	Jesse Phillips
45	*3.4*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 10:04*	*Window Well*	*West*	*Wood*	*White*	*Exterior*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
46	-0.1	mg/cm2	0.5	Negative	8/12/2019 10:05	Window Sash	West	Wood	White	Exterior	1930	First	Bent Mountain	Jesse Phillips
47	0.4	mg/cm2	0.4	Negative	8/12/2019 10:06	Window Sash	West	Wood	White	Exterior	1930	First	Bent Mountain	Jesse Phillips
48	*1.8*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 10:06*	*Window Sash*	*West*	*Wood*	*White*	*Exterior*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
49	*9*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 10:07*	*Window Casing*	*West*	*Wood*	*White*	*Exterior*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
50	0.1	mg/cm2	0.4	Negative	8/12/2019 10:10	Wall	West	Plaster	White	1	1930	First	Bent Mountain	Jesse Phillips
51	0.2	mg/cm2	0.5	Negative	8/12/2019 10:10	Wall	North	Plaster	White	1	1930	First	Bent Mountain	Jesse Phillips
52	0.2	mg/cm2	0.5	Negative	8/12/2019 10:11	Wall Wall below chair rail	North	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
53	0.3	mg/cm2	0.4	Negative	8/12/2019 10:11	Wall Wall below chair rail	East	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
54	*6.7*	*mg/cm2*	*0.5*	*Positive*	*8/12/2019 10:12*	*Chair Rail -replacement piece*	*South*	*Wood*	*Blue*	*1*	*1930*	*First*	*Bent Mountain*	*Jesse Phillips*
55	0.3	mg/cm2	0.4	Negative	8/12/2019 10:12	Chair Rail	East	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
56	0.1	mg/cm2	0.4	Negative	8/12/2019 10:13	Bulletin Board - Large	East	Cork	White	1	1930	First	Bent Mountain	Jesse Phillips
57	0.1	mg/cm2	0.5	Negative	8/12/2019 10:14	Bulletin Board casing	East	Wood	Beige	1	1930	First	Bent Mountain	Jesse Phillips
58	0.1	mg/cm2	0.4	Negative	8/12/2019 10:15	Chalk Board Casing	East	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
59	0.1	mg/cm2	0.4	Negative	8/12/2019 10:15	Shelf	South	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
60	0	mg/cm2	0.4	Negative	8/12/2019 10:16	Shelf Beadboard	South	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Side	Substrate	Color	Room	Built Date	Floor	Project	Inspector
61	0	mg/cm2	0.4	Negative	8/12/2019 10:16	Shelf Casing	South	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
62	0.1	mg/cm2	0.4	Negative	8/12/2019 10:17	Door Closet	South	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
63	0.2	mg/cm2	0.4	Negative	8/12/2019 10:18	Door Closet Casing	South	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
64	0.1	mg/cm2	0.5	Negative	8/12/2019 10:18	Window Sill	West	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
65	0.7	mg/cm2	0.2	Negative	8/12/2019 10:19	Window Sash	West	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
66	0	mg/cm2	0.4	Negative	8/12/2019 10:21	Window Casing	West	Wood	Blue	1	1930	First	Bent Mountain	Jesse Phillips
67	0.5	mg/cm2	0.3	Negative	8/12/2019 10:21	Door Casing	East	Metal	Blue	1	1930	First	Bent Mountain	Jesse Phillips
68	0	mg/cm2	0.4	Negative	8/12/2019 10:23	Door	East	Wood	Varnish/Stain	1	1930	First	Bent Mountain	Jesse Phillips
69	0.5	mg/cm2	0.3	Negative	8/12/2019 10:26	Ceiling	N/A	Plaster	White	1	1930	First	Bent Mountain	Jesse Phillips
70	0.1	mg/cm2	0.5	Negative	8/12/2019 10:26	Floor	N/A	Wood	Varnish/Stain	1	1930	First	Bent Mountain	Jesse Phillips
71	0.1	mg/cm2	0.4	Negative	8/12/2019 10:28	Wall	West	Plaster	White	2	1930	First	Bent Mountain	Jesse Phillips
72	0.2	mg/cm2	0.4	Negative	8/12/2019 10:30	Chair Rail	South	Wood	Blue	2	1930	First	Bent Mountain	Jesse Phillips
73	0.3	mg/cm2	0.4	Negative	8/12/2019 10:31	Closet Wall	South	Wood	Gray	2	1930	First	Bent Mountain	Jesse Phillips
74	0.3	mg/cm2	0.4	Negative	8/12/2019 10:31	Closet Shelf	South	Wood	Gray	2	1930	First	Bent Mountain	Jesse Phillips
75	0.3	mg/cm2	0.4	Negative	8/12/2019 10:31	Closet Chair Rail	South	Wood	Gray	2	1930	First	Bent Mountain	Jesse Phillips
76	0.1	mg/cm2	0.5	Negative	8/12/2019 10:32	Closet Wall	South	Plaster	Off-White	2	1930	First	Bent Mountain	Jesse Phillips
77	0.3	mg/cm2	0.4	Negative	8/12/2019 10:33	Wall Wall below chair rail	East	Plaster	Off-White	2	1930	First	Bent Mountain	Jesse Phillips
78	0.5	mg/cm2	0.3	Negative	8/12/2019 10:34	Wall Wall above chair rail	North	Plaster	White	3	1930	First	Bent Mountain	Jesse Phillips
79	***2.5***	***mg/cm2***	***0.4***	***Positive***	***8/12/2019 10:35***	***Bulletin Board Above Chalkboard***	***West***	***Cork***	***White***	***3***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***
80	***2.6***	***mg/cm2***	***0.4***	***Positive***	***8/12/2019 10:36***	***Bulletin Board Above Chalkboard***	***North***	***Cork***	***White***	***3***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***
81	0.3	mg/cm2	0.4	Negative	8/12/2019 10:37	Bulletin Board -	North	Wood	Blue	3	1930	First	Bent Mountain	Jesse Phillips
82	0.2	mg/cm2	0.4	Negative	8/12/2019 10:37	Bulletin Board -	North	Wood	Blue	3	1930	First	Bent Mountain	Jesse Phillips
83	0.2	mg/cm2	0.4	Negative	8/12/2019 10:37	Bulletin Board -	North	Wood	Blue	3	1930	First	Bent Mountain	Jesse Phillips
84	0.3	mg/cm2	0.4	Negative	8/12/2019 10:38	Cabinet Door	East	Wood	Blue	3	1930	First	Bent Mountain	Jesse Phillips
85	0.1	mg/cm2	0.4	Negative	8/12/2019 10:40	Crown Molding	West	Wood	Blue	3	1930	First	Bent Mountain	Jesse Phillips
86	0.1	mg/cm2	0.4	Negative	8/12/2019 10:41	Door	West	Wood	Varnish/Stain	4	1930	First	Bent Mountain	Jesse Phillips
87	0.5	mg/cm2	0.3	Negative	8/12/2019 10:42	Door Casing	West	Metal	Blue	4	1930	First	Bent Mountain	Jesse Phillips
88	-0.1	mg/cm2	0.5	Negative	8/12/2019 10:43	Wall	West	Plaster	White	4	1930	First	Bent Mountain	Jesse Phillips
89	0.1	mg/cm2	0.4	Negative	8/12/2019 10:43	Wall	East	Plaster	White	4	1930	First	Bent Mountain	Jesse Phillips
90	0	mg/cm2	0.4	Negative	8/12/2019 10:44	Window Sill	East	Wood	Blue	4	1930	First	Bent Mountain	Jesse Phillips
91	0.7	mg/cm2	0.2	Negative	8/12/2019 10:44	Window Sash	East	Wood	Blue	4	1930	First	Bent Mountain	Jesse Phillips
92	0.2	mg/cm2	0.5	Negative	8/12/2019 10:45	Window Mullion	East	Wood	Blue	4	1930	First	Bent Mountain	Jesse Phillips
93	***12.1***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 10:46***	***Window Parting Bead***	***East***	***Wood***	***White***	***4***	***1930***	***First - Exterior side***	***Bent Mountain***	***Jesse Phillips***
94	0.1	mg/cm2	0.4	Negative	8/12/2019 10:47	Wall	East	Plaster	White	4	1930	First	Bent Mountain	Jesse Phillips
95	0.1	mg/cm2	0.5	Negative	8/12/2019 10:48	Wall	North	Gypsum Board	White	4	1930	First	Bent Mountain	Jesse Phillips
96	0	mg/cm2	0.4	Negative	8/12/2019 10:56	Ceiling	N/A	Plaster	White	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
97	0.6	mg/cm2	0.3	Negative	8/12/2019 10:56	Ceiling	N/A	Plaster	White	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
98	0.1	mg/cm2	0.4	Negative	8/12/2019 10:57	Wall	South	Plaster	White	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
99	0.2	mg/cm2	0.5	Negative	8/12/2019 10:59	Shelf	East	Wood	Blue	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
100	0.1	mg/cm2	0.4	Negative	8/12/2019 11:00	Chair Rail	East	Wood	Blue	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
101	-0.2	mg/cm2	0.4	Negative	8/12/2019 11:02	Door Closet	East	Wood	Blue	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
102	0.2	mg/cm2	0.4	Negative	8/12/2019 11:03	Door Closet Casing	East	Wood	Blue	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
103	0	mg/cm2	0.4	Negative	8/12/2019 11:03	Window Sill	South	Wood	Blue	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
104	0.2	mg/cm2	0.4	Negative	8/12/2019 11:03	Window Sash	South	Wood	Blue	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
105	0	mg/cm2	0.4	Negative	8/12/2019 11:04	Window Mullion	South	Wood	Blue	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
106	-0.1	mg/cm2	0.4	Negative	8/12/2019 11:04	Closet Wall	East	Wood	Gray	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
107	0.1	mg/cm2	0.4	Negative	8/12/2019 11:05	Closet Chair Rail	East	Wood	Gray	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
108	-0.1	mg/cm2	0.5	Negative	8/12/2019 11:06	Closet Wall	East	Plaster	Gray	Office - Workroom	1930	First	Bent Mountain	Jesse Phillips
109	-0.1	mg/cm2	0.5	Negative	8/12/2019 11:09	Ceiling	N/A	Plaster	White	Principals Office	1930	First	Bent Mountain	Jesse Phillips
110	0.2	mg/cm2	0.5	Negative	8/12/2019 11:10	Wall	North	Plaster	Brown	Principals Office	1930	First	Bent Mountain	Jesse Phillips
111	0.1	mg/cm2	0.4	Negative	8/12/2019 11:10	Wall	East	Plaster	Brown	Principals Office	1930	First	Bent Mountain	Jesse Phillips
112	0.2	mg/cm2	0.5	Negative	8/12/2019 11:11	Wall	South	Plaster	Brown	Principals Office	1930	First	Bent Mountain	Jesse Phillips
113	-0.4	mg/cm2	0.5	Negative	8/12/2019 11:11	Wall	West	Plaster	Brown	Principals Office	1930	First	Bent Mountain	Jesse Phillips
114	0	mg/cm2	0.4	Negative	8/12/2019 11:12	Window Sill	South	Wood	Off-White	Principals Office	1930	First	Bent Mountain	Jesse Phillips
115	0.1	mg/cm2	0.4	Negative	8/12/2019 11:12	Window Sash	South	Wood	Off-White	Principals Office	1930	First	Bent Mountain	Jesse Phillips
116	0.2	mg/cm2	0.5	Negative	8/12/2019 11:13	Window Mullion	South	Wood	Off-White	Principals Office	1930	First	Bent Mountain	Jesse Phillips
117	0.1	mg/cm2	0.4	Negative	8/12/2019 11:13	Window Casing	South	Wood	Off-White	Principals Office	1930	First	Bent Mountain	Jesse Phillips
118	0	mg/cm2	0.4	Negative	8/12/2019 11:15	Floor	N/A	Wood	Varnish/Stain	Main Office - General	1930	First	Bent Mountain	Jesse Phillips
119	0.2	mg/cm2	0.5	Negative	8/12/2019 11:16	Wall	North	Plaster	White	Media Center	1930	First	Bent Mountain	Jesse Phillips
120	0.1	mg/cm2	0.4	Negative	8/12/2019 11:17	Wall	East	Gypsum Board	White	Media Center	1930	First	Bent Mountain	Jesse Phillips
121	0.2	mg/cm2	0.4	Negative	8/12/2019 11:18	Wall	West	Gypsum Board	White	Media Center	1930	First	Bent Mountain	Jesse Phillips
122	0.1	mg/cm2	0.4	Negative	8/12/2019 11:19	Wall	South	Gypsum Board	White	Media Center	1930	First	Bent Mountain	Jesse Phillips
123	0.1	mg/cm2	0.5	Negative	8/12/2019 11:20	Door Casing	South	Metal	Blue	Media Center	1930	First	Bent Mountain	Jesse Phillips
124	0	mg/cm2	0.4	Negative	8/12/2019 11:22	Window Sill	North	Wood	Blue	6	1930	First	Bent Mountain	Jesse Phillips
125	***1.4***	***mg/cm2***	***0.3***	***Positive***	***8/12/2019 11:22***	***Window Sash***	***North***	***Wood***	***Blue***	***6***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***
126	0.4	mg/cm2	0.4	Negative	8/12/2019 11:23	Window Sash	North	Wood	Blue	6	1930	First	Bent Mountain	Jesse Phillips
127	***1.4***	***mg/cm2***	***0.3***	***Positive***	***8/12/2019 11:23***	***Window Sash***	***North***	***Wood***	***Blue***	***6***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Side	Substrate	Color	Room	Built Date	Floor	Project	Inspector
128	0.3	mg/cm2	0.4	Negative	8/12/2019 11:24	Window Mullion	North	Wood	Blue	6	1930	First	Bent Mountain	Jesse Phillips
129	***1***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 11:25***	***Window Sash***	***North***	***Wood***	***Blue***	***Media Center***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***
130	0.4	mg/cm2	0.4	Negative	8/12/2019 11:26	Window Sash	North	Wood	Blue	Media Center	1930	First	Bent Mountain	Jesse Phillips
131	***1.4***	***mg/cm2***	***0.3***	***Positive***	***8/12/2019 11:26***	***Window Sash***	***North***	***Wood***	***Blue***	***Media Center***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***
132	0.1	mg/cm2	0.5	Negative	8/12/2019 11:28	Window Casing	East	Metal	Blue	Media Center	1930	First	Bent Mountain	Jesse Phillips
133	0	mg/cm2	0.4	Negative	8/12/2019 11:29	Door	North	Wood	Blue	East Hallway	1930	First	Bent Mountain	Jesse Phillips
134	0	mg/cm2	0.4	Negative	8/12/2019 11:29	Door	North	Wood	Blue	East Hallway	1930	First	Bent Mountain	Jesse Phillips
135	0	mg/cm2	0.4	Negative	8/12/2019 11:29	Door	North	Wood	Blue	East Hallway	1930	First	Bent Mountain	Jesse Phillips
136	***11.5***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 11:30***	***Door Mullion***	***North***	***Wood***	***Blue***	***East Hallway***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***
137	0.3	mg/cm2	0.4	Negative	8/12/2019 11:30	Door Casing	North	Wood	Blue	East Hallway	1930	First	Bent Mountain	Jesse Phillips
138	0.3	mg/cm2	0.5	Negative	8/12/2019 11:31	Wall	North	Plaster	White	East Hallway	1930	First	Bent Mountain	Jesse Phillips
139	0	mg/cm2	0.5	Negative	8/12/2019 11:32	Wall	West	Plaster	White	East Hallway	1930	First	Bent Mountain	Jesse Phillips
140	0.1	mg/cm2	0.5	Negative	8/12/2019 11:32	Wall	West	Concrete	White	East Hallway	1930	First	Bent Mountain	Jesse Phillips
141	0.1	mg/cm2	0.5	Negative	8/12/2019 11:33	Wall	East	Plaster	White	East Hallway	1930	First	Bent Mountain	Jesse Phillips
142	-0.3	mg/cm2	0.5	Negative	8/12/2019 11:33	Wall	South	Plaster	White	East Hallway	1930	First	Bent Mountain	Jesse Phillips
143	0	mg/cm2	0.4	Negative	8/12/2019 11:34	Corner Trim	North	Wood	Blue	East Hallway	1930	First	Bent Mountain	Jesse Phillips
144	-0.1	mg/cm2	0.4	Negative	8/12/2019 11:35	Column	South	Wood	Blue	South Hallway	1930	First	Bent Mountain	Jesse Phillips
145	0.2	mg/cm2	0.4	Negative	8/12/2019 11:36	Door Casing	South	Wood	Blue	South Hallway	1930	First	Bent Mountain	Jesse Phillips
146	0.4	mg/cm2	0.4	Negative	8/12/2019 11:37	Door Casing	South	Wood	Blue	South Hallway	1930	First	Bent Mountain	Jesse Phillips
147	0	mg/cm2	0.4	Negative	8/12/2019 11:37	Door	South	Wood	Red	South Hallway	1930	First	Bent Mountain	Jesse Phillips
148	0.2	mg/cm2	0.5	Negative	8/12/2019 11:38	Wall Wall below chair rail	South	Wood	Blue	South Hallway	1930	First	Bent Mountain	Jesse Phillips
149	0.3	mg/cm2	0.4	Negative	8/12/2019 11:38	Wall Wall above chair rail	South	Plaster	White	South Hallway	1930	First	Bent Mountain	Jesse Phillips
150	0.4	mg/cm2	0.4	Negative	8/12/2019 11:39	Chair Rail	South	Wood	Blue	South Hallway	1930	First	Bent Mountain	Jesse Phillips
151	0.1	mg/cm2	0.4	Negative	8/12/2019 11:51	Wall	North	Gypsum Board	White	7	1930	First	Bent Mountain	Jesse Phillips
152	0.1	mg/cm2	0.5	Negative	8/12/2019 11:51	Wall	West	Gypsum Board	White	7	1930	First	Bent Mountain	Jesse Phillips
153	0	mg/cm2	0.5	Negative	8/12/2019 11:53	Panel Access	West	Metal	White	7 - Bathroom	1930	First	Bent Mountain	Jesse Phillips
154	0	mg/cm2	0.4	Negative	8/12/2019 11:53	Chair Rail	North	Wood	White	7 - Bathroom	1930	First	Bent Mountain	Jesse Phillips
155	0.1	mg/cm2	0.4	Negative	8/12/2019 11:54	Ceiling	N/A	Gypsum Board	White	7 - Bathroom	1930	First	Bent Mountain	Jesse Phillips
156	0	mg/cm2	0.5	Negative	8/12/2019 11:54	Door Casing	South	Metal	Blue	7 - Bathroom	1930	First	Bent Mountain	Jesse Phillips
157	-0.1	mg/cm2	0.4	Negative	8/12/2019 11:55	Door	South	Wood	Varnish/Stain	7 - Bathroom	1930	First	Bent Mountain	Jesse Phillips
158	0.1	mg/cm2	0.4	Negative	8/12/2019 11:57	Window Sill	North	Wood	Blue	8	1930	First	Bent Mountain	Jesse Phillips
159	***1.3***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 11:57***	***Window Sash***	***North***	***Wood***	***Blue***	***8***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***
160	***1.2***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 11:58***	***Window Sash***	***North***	***Wood***	***Blue***	***8***	***1930***	***First***	***Bent Mountain***	***Jesse Phillips***
161	-0.2	mg/cm2	0.5	Negative	8/12/2019 12:00	Wall	North	Brick	Brown	9	1930	First	Bent Mountain	Jesse Phillips
162	0	mg/cm2	0.5	Negative	8/12/2019 12:00	Wall	North	Brick	White	9	1930	First	Bent Mountain	Jesse Phillips
163	0.2	mg/cm2	0.5	Negative	8/12/2019 12:01	Wall	South	Brick	White	9	1930	First	Bent Mountain	Jesse Phillips
164	0.2	mg/cm2	0.4	Negative	8/12/2019 12:01	Wall	West	Gypsum Board	White	9	1930	First	Bent Mountain	Jesse Phillips
165	0.7	mg/cm2	0.2	Negative	8/12/2019 12:04	Ceiling	N/A	Plaster	White	9	1930	First	Bent Mountain	Jesse Phillips
166	0.1	mg/cm2	0.5	Negative	8/12/2019 12:05	Floor	N/A	Concrete	Maroon	9	1930	First	Bent Mountain	Jesse Phillips
167	0.2	mg/cm2	0.5	Negative	8/12/2019 12:07	Floor	N/A	Concrete	Maroon	9	1930	First	Bent Mountain	Jesse Phillips
168	0.1	mg/cm2	0.4	Negative	8/12/2019 12:07	Window Sill	West	Wood	Beige	9	1930	First	Bent Mountain	Jesse Phillips
169	0.2	mg/cm2	0.4	Negative	8/12/2019 12:08	Window Sash	West	Wood	Beige	9	1930	First	Bent Mountain	Jesse Phillips
170	0.9	mg/cm2	0.2	Negative	8/12/2019 12:09	Window Sash	West	Wood	Beige	9	1930	First	Bent Mountain	Jesse Phillips
171	0	mg/cm2	0.5	Negative	8/12/2019 12:10	Window Mullion	West	Wood	Beige	9	1930	First	Bent Mountain	Jesse Phillips
172	0	mg/cm2	0.4	Negative	8/12/2019 12:11	Panel Mounting	North	Gypsum Board	Gray	9	1930	First	Bent Mountain	Jesse Phillips
173	0.1	mg/cm2	0.4	Negative	8/12/2019 12:12	Pipe Domestic Water	South	Paper Jacketing	White	9	1930	First	Bent Mountain	Jesse Phillips
174	0.2	mg/cm2	0.5	Negative	8/12/2019 12:13	Pipe Vent	North	Metal	Brown	9	1930	First	Bent Mountain	Jesse Phillips
175	0.2	mg/cm2	0.5	Negative	8/12/2019 12:15	Door	North	Wood	White	Boiler/Mech/Utility	1930	Stairwell	Bent Mountain	Jesse Phillips
176	0.1	mg/cm2	0.4	Negative	8/12/2019 12:15	Door Casing	North	Wood	White	Boiler/Mech/Utility	1930	Stairwell	Bent Mountain	Jesse Phillips
177	***7.2***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 12:16***	***Fascia***	***North***	***Wood***	***White***	***Boiler/Mech/Utility***	***1930***	***Stairwell***	***Bent Mountain***	***Jesse Phillips***
178	***14.9***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 12:16***	***Roof Top***	***North***	***Metal***	***Red***	***Boiler/Mech/Utility***	***1930***	***Stairwell***	***Bent Mountain***	***Jesse Phillips***
179	***2.6***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 12:18***	***Wall***	***North***	***Concrete***	***White***	***Boiler/Mech/Utility***	***1930***	***Basement - Room B***	***Bent Mountain***	***Jesse Phillips***
180	***1.3***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 12:19***	***Wall***	***North***	***Concrete***	***White***	***Boiler/Mech/Utility***	***1930***	***Basement - Room B***	***Bent Mountain***	***Jesse Phillips***
181	***1.1***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 12:20***	***Wall***	***South***	***Concrete***	***White***	***Boiler/Mech/Utility***	***1930***	***Basement - Room B***	***Bent Mountain***	***Jesse Phillips***
182	0.1	mg/cm2	0.5	Negative	8/12/2019 12:21	Wall	East	Concrete	White	Boiler/Mech/Utility	1930	Basement - Room C	Bent Mountain	Jesse Phillips
183	0.2	mg/cm2	0.5	Negative	8/12/2019 12:22	Wall	West	Concrete	White	Boiler/Mech/Utility	1930	Basement - Room C	Bent Mountain	Jesse Phillips
184	0.1	mg/cm2	0.5	Negative	8/12/2019 12:22	Wall	South	Concrete	White	Boiler/Mech/Utility	1930	Basement - Room C	Bent Mountain	Jesse Phillips
185	0.4	mg/cm2	0.4	Negative	8/12/2019 12:22	Wall	North	Concrete	White	Boiler/Mech/Utility	1930	Basement - Room C	Bent Mountain	Jesse Phillips
186	-0.1	mg/cm2	0.5	Negative	8/12/2019 12:24	Ceiling	N/A	Plaster	White	Boiler/Mech/Utility	1930	Basement - Room C	Bent Mountain	Jesse Phillips
187	0.4	mg/cm2	0.4	Negative	8/12/2019 12:24	Ceiling	N/A	Plaster	White	Boiler/Mech/Utility	1930	Basement - Room B	Bent Mountain	Jesse Phillips
188	0.1	mg/cm2	0.5	Negative	8/12/2019 12:25	Floor	N/A	Concrete	Gray	Boiler/Mech/Utility	1930	Basement - Room B	Bent Mountain	Jesse Phillips
189	0	mg/cm2	0.5	Negative	8/12/2019 12:25	Pipe Sewer	North	Metal	White	Boiler/Mech/Utility	1930	Basement - Room B	Bent Mountain	Jesse Phillips
190	***10.3***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 12:26***	***Door***	***West***	***Wood***	***White***	***Boiler/Mech/Utility***	***1930***	***Basement - Room A***	***Bent Mountain***	***Jesse Phillips***
191	0.4	mg/cm2	0.4	Negative	8/12/2019 12:26	Door Casing	West	Wood	White	Boiler/Mech/Utility	1930	Basement - Room A	Bent Mountain	Jesse Phillips
192	0	mg/cm2	0.5	Negative	8/12/2019 12:27	Wall	West	Concrete	White	Boiler/Mech/Utility	1930	Basement - Room A	Bent Mountain	Jesse Phillips
193	-0.1	mg/cm2	0.5	Negative	8/12/2019 12:28	Wall	North	Concrete	White	Boiler/Mech/Utility	1930	Basement - Room A	Bent Mountain	Jesse Phillips
194	1.3	mg/cm2	0.3	NULL	8/12/2019 12:28	Wall	East	Concrete	White	Boiler/Mech/Utility	1930	Basement - Room A	Bent Mountain	Jesse Phillips

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Side	Substrate	Color	Room	Built Date	Floor	Project	Inspector
195	***1.1***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 12:29***	***Wall***	***East***	***Concrete***	***White***	***Boiler/Mech/Utility***	***1930***	***Basement - Room A***	***Bent Mountain***	***Jesse Phillips***
196	0.3	mg/cm2	0.5	Negative	8/12/2019 12:30	Wall	South	Concrete	White	Boiler/Mech/Utility	1930	Basement - Room A	Bent Mountain	Jesse Phillips
197	0.1	mg/cm2	0.5	Negative	8/12/2019 12:30	Stair Tread	N/A	Concrete	Gray	Boiler/Mech/Utility	1930	Basement Stairwell	Bent Mountain	Jesse Phillips
198	0.1	mg/cm2	0.5	Negative	8/12/2019 12:31	Stair Tread	N/A	Concrete	Yellow	Boiler/Mech/Utility	1930	Basement Stairwell	Bent Mountain	Jesse Phillips
199	***3.1***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 12:32***	***Wall***	***East***	***Concrete***	***White***	***Boiler/Mech/Utility***	***1930***	***Basement Stairwell***	***Bent Mountain***	***Jesse Phillips***
200	0.1	mg/cm2	0.5	Negative	8/12/2019 12:40	Framing	West	Metal	White	Exterior	1990	Exterior	Bent Mountain	Jesse Phillips
201	0.1	mg/cm2	0.5	Negative	8/12/2019 12:41	Door	West	Metal	Red	Exterior	1990	Exterior	Bent Mountain	Jesse Phillips
202	0	mg/cm2	0.5	Negative	8/12/2019 12:44	Door	West	Metal	Red	Foyer	1990	First	Bent Mountain	Jesse Phillips
203	0	mg/cm2	0.5	Negative	8/12/2019 12:45	Framing	West	Metal	Blue	Foyer	1990	First	Bent Mountain	Jesse Phillips
204	0.2	mg/cm2	0.5	Negative	8/12/2019 12:45	Framing	West	Metal	Blue	Foyer	1990	First	Bent Mountain	Jesse Phillips
205	0.1	mg/cm2	0.5	Negative	8/12/2019 12:45	Framing	East	Metal	Blue	Foyer	1990	First	Bent Mountain	Jesse Phillips
206	0	mg/cm2	0.5	Negative	8/12/2019 12:46	Door	East	Metal	Red	Foyer	1990	First	Bent Mountain	Jesse Phillips
207	0.6	mg/cm2	0.3	Negative	8/12/2019 12:48	Door Casing	North	Metal	Blue	Foyer	1990	First	Bent Mountain	Jesse Phillips
208	0	mg/cm2	0.4	Negative	8/12/2019 12:49	Door	North	Wood	Varnish/Stain	Foyer	1990	First	Bent Mountain	Jesse Phillips
209	-0.3	mg/cm2	0.5	Negative	8/12/2019 12:50	Wall	South	CMU	White	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
210	-0.1	mg/cm2	0.5	Negative	8/12/2019 12:51	Wall	West	CMU	White	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
211	-0.1	mg/cm2	0.5	Negative	8/12/2019 12:51	Wall	North	CMU	White	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
212	-0.1	mg/cm2	0.5	Negative	8/12/2019 12:52	Wall	East	CMU	White	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
213	0.6	mg/cm2	0.3	Negative	8/12/2019 12:53	Door Casing	East	Metal	Brown	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
214	0.8	mg/cm2	0.2	Negative	8/12/2019 12:53	Floor	N/A	Wood	Varnish/Stain	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
215	0.6	mg/cm2	0.2	Negative	8/12/2019 12:54	Floor	N/A	Wood	White	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
216	0.6	mg/cm2	0.3	Negative	8/12/2019 12:55	Floor	N/A	Wood	Red	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
217	0.6	mg/cm2	0.3	NULL	8/12/2019 12:56	Floor	N/A	Wood	Black	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
218	0.6	mg/cm2	0.3	Negative	8/12/2019 12:57	Floor	N/A	Wood	Black	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
219	0	mg/cm2	0.5	Negative	8/12/2019 12:58	Stair Riser	East	Wood	White	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
220	-0.1	mg/cm2	0.5	Negative	8/12/2019 12:58	Wall	East	CMU	Black	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
221	-0.1	mg/cm2	0.4	Negative	8/12/2019 13:00	Wall	South	Gypsum Board	Black	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
222	0.1	mg/cm2	0.4	Negative	8/12/2019 13:01	Wall	South	Gypsum Board	White	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
223	0	mg/cm2	0.5	Negative	8/12/2019 13:02	Door Casing	South	Metal	Beige	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
224	0.1	mg/cm2	0.5	Negative	8/12/2019 13:03	Ladder Siderail	N/A	Metal	Beige	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
225	0.5	mg/cm2	0.3	Negative	8/12/2019 13:04	Door Casing	West	Metal	Brown	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
226	0.5	mg/cm2	0.4	Negative	8/12/2019 13:04	Door Casing	North	Metal	Brown	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
227	0.1	mg/cm2	0.5	Negative	8/12/2019 13:05	Door	North	Metal	Brown	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
228	0	mg/cm2	0.4	Negative	8/12/2019 13:06	Acoustical Panel	South	Fiberboard or Cementboard	White	Cafetorium	1990	First	Bent Mountain	Jesse Phillips
229	-0.2	mg/cm2	0.5	Negative	8/12/2019 13:07	Wall	South	CMU	White	Kitchen	1990	First	Bent Mountain	Jesse Phillips
230	0	mg/cm2	0.5	Negative	8/12/2019 13:08	Wall	East	CMU	White	Kitchen	1990	First	Bent Mountain	Jesse Phillips
231	-0.2	mg/cm2	0.5	Negative	8/12/2019 13:08	Wall	West	CMU	White	Kitchen	1990	First	Bent Mountain	Jesse Phillips
232	0	mg/cm2	0.5	Negative	8/12/2019 13:09	Wall	North	CMU	White	Kitchen	1990	First	Bent Mountain	Jesse Phillips
233	0.2	mg/cm2	0.4	Negative	8/12/2019 13:10	Ceiling	N/A	Gypsum Board	White	Kitchen	1990	First	Bent Mountain	Jesse Phillips
234	0	mg/cm2	0.5	Negative	8/12/2019 13:10	Floor	N/A	Ceramic Tile	Unpainted	Kitchen	1990	First	Bent Mountain	Jesse Phillips
235	-0.1	mg/cm2	0.4	Negative	8/12/2019 13:12	Door Screen	North	Wood	Red	Kitchen	1990	First	Bent Mountain	Jesse Phillips
236	0.4	mg/cm2	0.4	Negative	8/12/2019 13:12	Door Casing	North	Metal	Off-White	Kitchen	1990	First	Bent Mountain	Jesse Phillips
237	0	mg/cm2	0.5	Negative	8/12/2019 13:13	Door	North	Metal	Off-White	Kitchen	1990	First	Bent Mountain	Jesse Phillips
238	-0.1	mg/cm2	0.4	Negative	8/12/2019 13:15	Shelf	West	Wood	Off-White	Storage	1990	First	Bent Mountain	Jesse Phillips
239	-0.2	mg/cm2	0.5	Negative	8/12/2019 13:18	Wall	North	CMU	Off-White	Male Bathroom	1990	First	Bent Mountain	Jesse Phillips
240	0	mg/cm2	0.4	Negative	8/12/2019 13:20	Panel	N/A	Metal	Off-White	Male Bathroom	1990	First	Bent Mountain	Jesse Phillips
241	0.3	mg/cm2	0.5	Negative	8/12/2019 13:20	Floor	N/A	Ceramic Tile	Blue	Male Bathroom	1990	First	Bent Mountain	Jesse Phillips
242	0.2	mg/cm2	0.5	Negative	8/12/2019 13:21	Floor	N/A	Ceramic Tile	Putty	Male Bathroom	1990	First	Bent Mountain	Jesse Phillips
243	0	mg/cm2	0.5	Negative	8/12/2019 13:21	Floor	N/A	Ceramic Tile	Brown	Male Bathroom	1990	First	Bent Mountain	Jesse Phillips
244	0.1	mg/cm2	0.5	Negative	8/12/2019 13:41	Roof Top	N/A	Metal	Red	Library	1990	Exterior	Bent Mountain	Jesse Phillips
245	0.1	mg/cm2	0.4	Negative	8/12/2019 13:42	Roof Top	N/A	Metal	White	Library Area Parapet Coping	1990	Exterior	Bent Mountain	Jesse Phillips
246	***18.9***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 13:43***	***Roof Top***	***N/A***	***Metal***	***Red***	***Red Flashing "awning" at breezeway***	***1990***	***Exterior***	***Bent Mountain***	***Jesse Phillips***
247	0.2	mg/cm2	0.5	Negative	8/12/2019 13:44	Roof Top	N/A	Metal	Red	Cafetorium	1990	Exterior	Bent Mountain	Jesse Phillips
248	-0.2	mg/cm2	0.4	Negative	8/12/2019 13:45	Fascia	N/A	Wood	White	Cafetorium	1990	Exterior	Bent Mountain	Jesse Phillips
249	-0.1	mg/cm2	0.4	Negative	8/12/2019 13:45	Fascia	N/A	Wood	White	Cafetorium	1990	Exterior	Bent Mountain	Jesse Phillips
250	-0.2	mg/cm2	0.4	Negative	8/12/2019 13:46	Fascia	N/A	Wood	White	Cafetorium	1990	Exterior	Bent Mountain	Jesse Phillips
251	***10.4***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 13:47***	***Fascia***	***N/A***	***Wood***	***White***	***Original Gym Roof Perimeter***	***1930***	***Exterior***	***Bent Mountain***	***Jesse Phillips***
252	0.1	mg/cm2	0.4	Negative	8/12/2019 13:48	Vent	N/A	Metal	Red	Original Gym Roof Perimeter	1930	Exterior	Bent Mountain	Jesse Phillips
253	0.2	mg/cm2	0.5	Negative	8/12/2019 13:48	Vent	N/A	Metal	Red	Original Gym Roof Perimeter	1930	Exterior	Bent Mountain	Jesse Phillips
254	0.7	mg/cm2	0.2	Negative	8/12/2019 13:50	Vent	N/A	Metal	Red	Original Gym Roof Perimeter	1930	Exterior	Bent Mountain	Jesse Phillips
255	0.7	mg/cm2	0.4	NULL	8/12/2019 13:51	Vent	N/A	Metal	Red	Original Gym Roof Perimeter	1930	Exterior	Bent Mountain	Jesse Phillips
256	0.3	mg/cm2	0.5	Negative	8/12/2019 13:52	Vent	N/A	Metal	Red	Original Gym Roof Perimeter	1930	Exterior	Bent Mountain	Jesse Phillips
257	***2.2***	***mg/cm2***	***0.5***	***Positive***	***8/12/2019 13:53***	***Vent***	***N/A***	***Metal***	***White***	***Original Gym Roof Perimeter***	***1930***	***Exterior***	***Bent Mountain***	***Jesse Phillips***
258	0	mg/cm2	0.4	Negative	8/12/2019 13:59	Fascia	West	Metal	White	White Flashingat breezeway	1930	Exterior	Bent Mountain	Jesse Phillips
259	0	mg/cm2	0.5	Negative	8/12/2019 13:59	Fascia	West	Metal	White	White Flashingat breezeway	1930	Exterior	Bent Mountain	Jesse Phillips
260	0.2	mg/cm2	0.5	Negative	8/12/2019 14:01	Ceiling	West	Plaster	White	Breezeway Exterior	1930	Exterior	Bent Mountain	Jesse Phillips
261	0	mg/cm2	0.5	Negative	8/12/2019 14:03	Sink Leg	North	Metal	Gray	Kitchen	1990	First	Bent Mountain	Jesse Phillips

Reading #	Concentration	Units	+/-	Result	DateTime	Component	Side	Substrate	Color	Room	Built Date	Floor	Project	Inspector
262	-0.3	mg/cm2	0.5	Negative	8/12/2019 14:12	Wall	South	CMU	Brown	HVAC Room 11	1990	First	Bent Mountain	Jesse Phillips
263	***1.1***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 14:33***	***Calibration***							***Bent Mountain***	***Jesse Phillips***
264	***1.1***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 14:34***	***Calibration***							***Bent Mountain***	***Jesse Phillips***
265	***1.1***	***mg/cm2***	***0.2***	***Positive***	***8/12/2019 14:34***	***Calibration***							***Bent Mountain***	***Jesse Phillips***

Performance Characteristic Sheet

EFFECTIVE DATE: **December 1, 2015**

MANUFACTURER AND MODEL:

Make: ***Heuresis***
Models: ***Model Pb200i***
Source: ***^{57}Co, 5 mCi (nominal – new source)***

FIELD OPERATION GUIDANCE

OPERATING PARAMETERS:

Action Level mode

XRF CALIBRATION CHECK LIMITS:

0.8 to 1.2 mg/cm^2 (inclusive)

SUBSTRATE CORRECTION:

Not applicable

INCONCLUSIVE RANGE OR THRESHOLD:

ACTION LEVEL MODE READING DESCRIPTION	SUBSTRATE	THRESHOLD (mg/cm^2)
Results not corrected for substrate bias on any substrate	Brick Concrete Drywall Metal Plaster Wood	1.0 1.0 1.0 1.0 1.0 1.0

BACKGROUND INFORMATION

EVALUATION DATA SOURCE AND DATE:

This sheet is supplemental information to be used in conjunction with Chapter 7 of the HUD *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* ("HUD Guidelines"). Performance parameters shown on this sheet are calculated using test results on building components in the HUD archive. Testing was conducted on 146 test samples in November 2015, with two separate instruments running software version 2.1-2 in Action Level test mode. The actual source strength of each instrument on the day of testing was approximately 2.0 mCi; source ages were approximately one year.

OPERATING PARAMETERS

Performance parameters shown in this sheet are applicable only when properly operating the instrument using the manufacturer's instructions and procedures described in Chapter 7 of the HUD Guidelines.

XRF CALIBRATION CHECK:

The calibration of the XRF instrument should be checked using the paint film nearest 1.0 mg/cm^2 in the NIST Standard Reference Material (SRM) used (e.g., for NIST SRM 2579, use the 1.02 mg/cm^2 film).

If the average (rounded to 1 decimal place) of three readings is outside the acceptable calibration check range, follow the manufacturer's instructions to bring the instrument into control before XRF testing proceeds.

SUBSTRATE CORRECTION VALUE COMPUTATION:

Chapter 7 of the HUD Guidelines provides guidance on correcting XRF results for substrate bias. Supplemental guidance for using the paint film nearest 1.0 mg/cm^2 for substrate correction is provided:

XRF results are corrected for substrate bias by subtracting from each XRF result a correction value determined separately in each house for single-family housing or in each development for multifamily housing, for each substrate. The correction value is an average of XRF readings taken over the NIST SRM paint film nearest to 1.0 mg/cm^2 at test locations that have been scraped bare of their paint covering. Compute the correction values as follows:

Using the same XRF instrument, take three readings on a bare substrate area covered with the NIST SRM paint film nearest 1 mg/cm^2. Repeat this procedure by taking three more readings on a second bare substrate area of the same substrate covered with the NIST SRM.

Compute the correction value for each substrate type where XRF readings indicate substrate correction is needed by computing the average of all six readings as shown below.

For each substrate type (the 1.02 mg/cm^2 NIST SRM is shown in this example; use the actual lead loading of the NIST SRM used for substrate correction):

Correction value = (1st + 2nd + 3rd + 4th + 5th + 6th *Reading*)/6 - 1.02 mg/cm^2

Repeat this procedure for each substrate requiring substrate correction in the house or housing development.

EVALUATING THE QUALITY OF XRF TESTING:

Randomly select ten testing combinations for retesting from each house or from two randomly selected units in multifamily housing.

Conduct XRF re-testing at the ten testing combinations selected for retesting.

Determine if the XRF testing in the units or house passed or failed the test by applying the steps below. Compute the Retest Tolerance Limit by the following steps:

Determine XRF results for the original and retest XRF readings. Do not correct the original or retest results for substrate bias. In single-family and multi-family housing, a result is defined as a single reading. Therefore, there will be ten original and ten retest XRF results for each house or for the two selected units.

Calculate the average of the original XRF result and the retest XRF result for each testing combination.

Square the average for each testing combination.

Add the ten squared averages together. Call this quantity C.

Multiply the number C by 0.0072. Call this quantity D.

Add the number 0.032 to D. Call this quantity E.

Take the square root of E. Call this quantity F.

Multiply F by 1.645. The result is the Retest Tolerance Limit.

Compute the average of all ten original XRF readings.

Compute the average of all ten re-test XRF readings.

Find the absolute difference of the two averages.

If the difference is less than the Retest Tolerance Limit, the inspection has passed the retest. If the difference of the overall averages equals or exceeds the Retest Tolerance Limit, this procedure should be repeated with ten new testing combinations. If the difference of the overall averages is equal to or greater than the Retest Tolerance Limit a second time, then the inspection should be considered deficient.

Use of this procedure is estimated to produce a spurious result approximately 1% of the time. That is, results of this procedure will call for further examination when no examination is warranted in approximately 1 out of 100 dwelling units tested.

TESTING TIMES:

In the Action Level paint test mode, the instrument takes the longest time to complete readings close to the Federal standard of 1.0 mg/cm^2. The table below shows the mean and standard deviation of actual reading times by reading level for paint samples during the November 2015 archive testing. The tested instruments reported readings to one decimal place. No significant differences in reading times by substrate were observed. These times apply only to instruments with the same source strength as those tested (2.0 mCi). Instruments with stronger sources will have shorter reading times and those with weaker sources, longer reading times, than those in the table.

Mean and Standard Deviation of Reading Times in Action Level Mode by Reading Level		
Reading (mg/cm^2)	**Mean Reading Time (seconds)**	**Standard Deviation (seconds)**
< 0.7	3.48	0.47
0.7	7.29	1.92
0.8	13.95	1.78
0.9 – 1.2	15.25	0.66
1.3 – 1.4	6.08	2.50
≥ 1.5	3.32	0.05

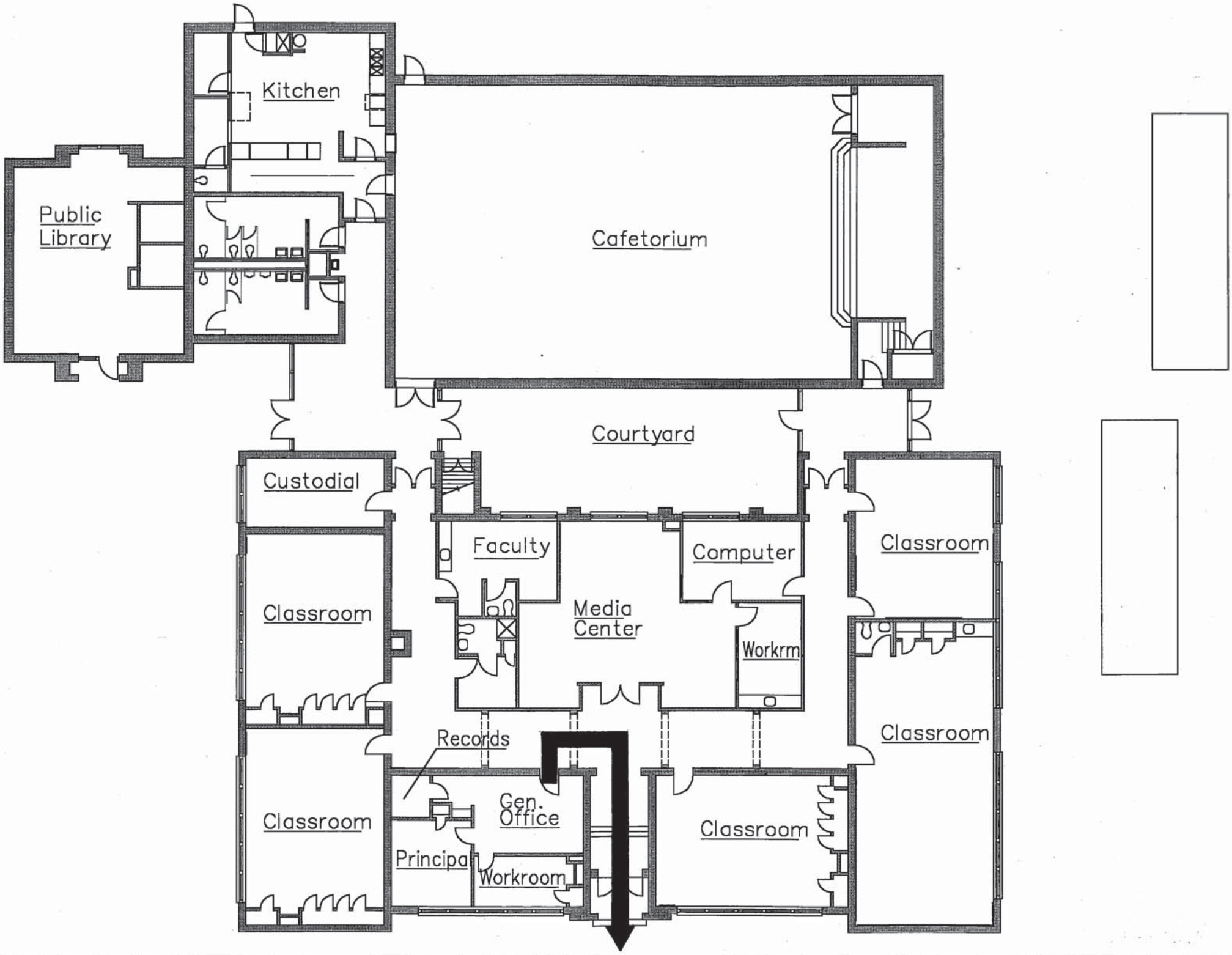
CLASSIFICATION OF RESULTS:

XRF results are classified as **positive** if they are **greater than or equal** to the stated threshold for the instrument (1.0 mg/cm^2), and *negative* if they are *less than* the threshold.

DOCUMENTATION:

A report titled *Methodology for XRF Performance Characteristic Sheets* (EPA 747-R-95-008) provides an explanation of the statistical methodology used to construct the data in the sheets, and provides empirical results from using the recommended inconclusive ranges or thresholds for specific XRF instruments. The report may be downloaded at http://www2.epa.gov/lead/methodology-xrf-performance-characteristic-sheets-epa-747-r-95-008-september-1997.

This XRF Performance Characteristic Sheet (PCS) was developed by QuanTech, Inc., under a contract with the XRF manufacturer.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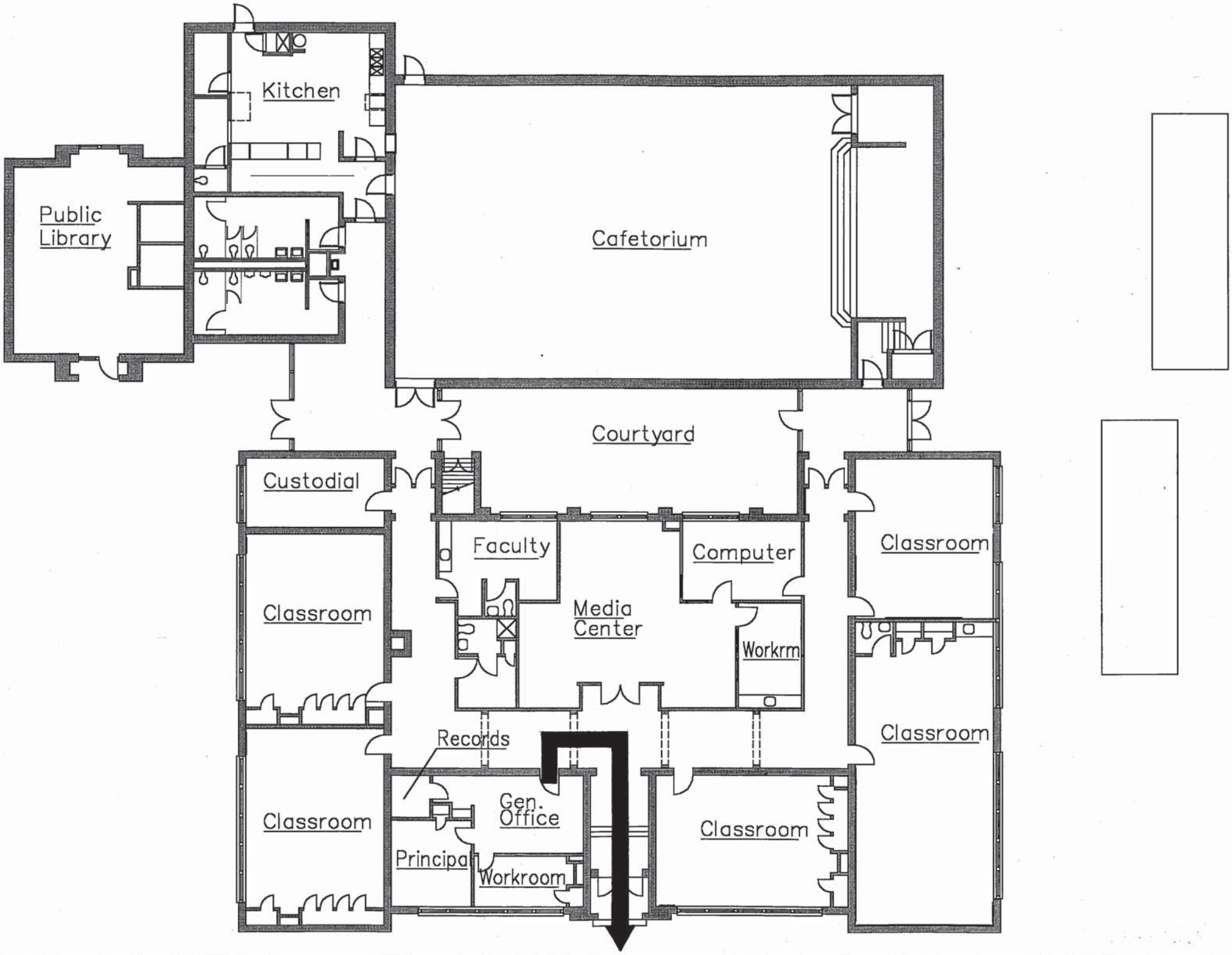
Public Library
Cafetorium
Courtyard
Custodial
Faculty
Computer
Classroom
Classroom
Media Center
Workrm
Records
Classroom
Gen. Office
Classroom
Principal
Workroom
Classroom


Kitchen
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Classroom
Media Center
Workrm
Records
Classroom
Gen. Office
Classroom
Principal
Workroom
Classroom

INVITATION TO BID #2020-026 BENT MOUNTAIN CENTER ROOF REPLACEMENT

Attachment E

Project Drawings

BENT MOUNTAIN CENTER

ROOF REPLACEMENT & REPAIRS

10148 TINSLEY LANE

BENT MOUNTAIN, VIRGINIA 24059

BALZER PROJECT NO. 03160018.00

BALZER & ASSOCIATES
PLANNERS / ARCHITECTS
ENGINEERS / SURVEYORS
Roanoke / Richmond
New River Valley / Staunton
Harrisonburg / Lynchburg
www.balzer.cc
1208 Corporate Circle
Roanoke, VA 24018
540.772.9580

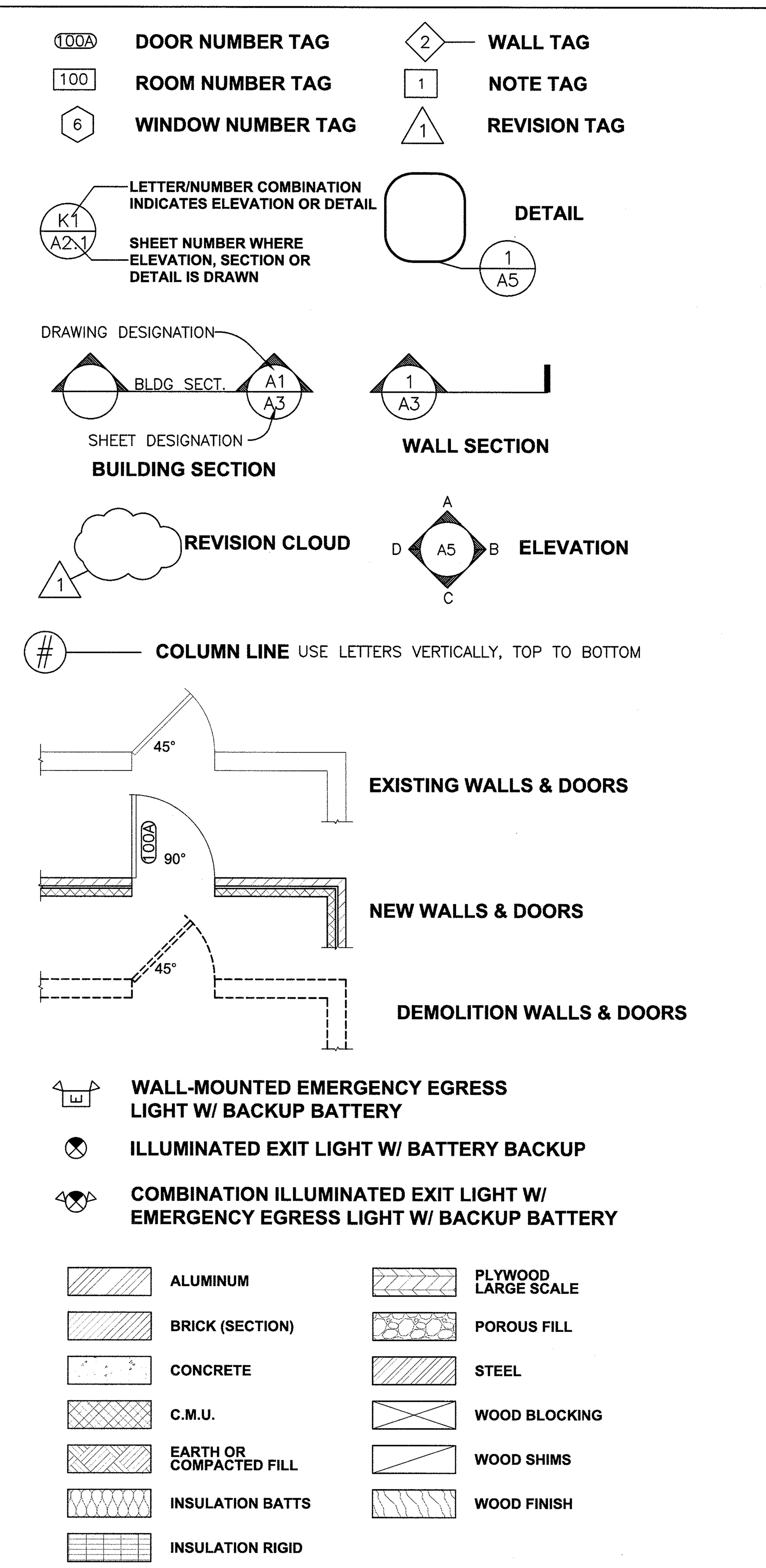
COMMONWEALTH OF VIRGINIA
ROBERT W. PILKINGTON
Lic. No. 013210
ARCHITECT
RWP 10/2/19

DRAWING ABBREVIATIONS

AFF	ABOVE FINISH FLOOR
AP	ACCESS PANEL
ACT	ACOUSTIC CEILING TILE
ACPL	ACOUSTICAL PLASTER
A/C	AIR CONDITIONING
ALUM	ALUMINUM
AB	ANCHOR BOLT
ANOD	ANODIZED
APPROX	APRROXIMATELY
AD	AREA DRAIN
ARCH	ARCHITECT(URAL)
ASPH	ASPHALT
BP	BASE PLATE
BSMT	BASEMENT
BM	BEAM
BRG	BEARING
BIT	BITUMINOUS
BLKG	BLOCKING
BD	BOARD
BOT	BOTTOM
BRK	BRICK
BLDG	BUILDING
CPT	CARPET
CO	CASED OPENING
CSMT	CASEMENT
CLG	CEILING
C/H	CEILING HEIGHT
CL	CENTER LINE
CT	CERAMIC TILE
CR	CHAIR RAIL
CLR	CLEAR(ANCE)
CLS	CLOSET
COL	COLUMN
CONC	CONCRETE
CMU	CONCRETE MASONRY UNIT
CONST	CONSTRUCTION
CONT	CONTINUOUS
CJ	CONTROL JOINT
CORR	CORRIDOR
CTR	COUNTER
CRS	COURSE
DEM	DEMOLITION
DEPT	DEPARTMENT
DIAG	DIAGONAL
DIAM	DIAMETER
DIM	DIMENSION
DO	DITTO
DIV	DIVISION
DR	DOOR
DH	DOUBLE HUNG
DS	DOWN SPOUT
D.	DRAIN
DT	DRAIN TILE
DWG	DRAWING
ELEC	ELECTRIC
EWC	ELECTRIC WATER COOLER
EP	ELECTRICAL PANEL BOARD
ELEV	ELEVATION
EMER	EMERGENCY
ENCL	ENCLOSE, ENCLOSURE
ENG	ENGINEER(ING)
ENT	ENTRANCE
EQ	EQUAL
EQUIP	EQUIPMENT
EXH	EXHAUST
EXIST	EXISTING
EB	EXPANSION BOLT
EJ	EXPANSION JOINT
EXT	EXTERIOR
FB	FACE BRICK
FOB	FACE OF BRICK
FT	FEET, FOOT
FN	FENCE
FIN	FINISH
FIN FL	FINISH FLOOR
FEC	FIRE EXTINGUSHER CABINET
FHC	FIRE HOSE CABINET
FPL	FIREPLACE
FLR	FLOOR(ING)
FD	FLOOR DRAIN
FLUOR	FLUORESCENT
FTG	FOOTING
FDN	FOUNDATION
FRA	FRESH AIR
FBO	FURNISHED BY OTHERS
GA	GAGE, GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GL	GLASS
GLB	GLASS BLOCK
GD	GRADE, GRADING
GWB	GYPSUM WALL BOARD
HC	HANDICAP
HDWR	HARDWARE
HWD	HARDWOOD
HDR	HEADER
HTG	HEATING
HVAC	HEATING/VENTING/AIR CONDITIONING
HD	HEAVY DUTY
HGT	HEIGHT
HOC	HOLLOW CORE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HB	HOSE BIBB
HW	HOT WATER HEATER
ID	INSIDE DIAMETER
INCL	INCLUDE(D)(ING)
INSUL	INSULATE
INT	INTERIOR
JAN	JANITOR'S CLOSET
KIT	KITCHEN
KD	KNOCK DOWN
KO	KNOCKOUT
LBL	LABEL
LAM	LAMINATE(D)
LAV	LAVATORY
LH	LEFT HAND
LG	LENGTH, LONG
LW	LIGHTWEIGHT
LTL	LINTEL
LL	LIVE LOAD
LVR	LOUVER

MH	MAN HOLE
MFR	MANUFACTURER
MAS	MASONRY
MO	MASONRY OPENING
MTL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MTL	METAL
MTL BLDG MFR	METAL BUILDING MANUFACTURER
MFD	METAL FLOOR DECKING
MRD	METAL ROOF DECKING
MIN	MINIMUM
MISC	MISCELLANEOUS
MLDG	MOLDING, MOULDING
MTG	MOUNTING
NOM	NOMINAL
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
NO, #	NUMBER
OC	ON CENTER
OPG	OPENING
OPP	OPPOSITE
OPH	OPPOSITE HAND
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OA	OVERALL
OH	OVERHANG
PNL	PANEL
PVMT	PAVEMENT
PTD	PAINTED
PBD	PARTICAL BOARD
PLAST	PLASTER
PLAM	PLASTIC LAMINATE
PL	PLATE
PLGL	PLATE GLASS
PWD	PLYWOOD
PVC	POLYVINYL CHLORIDE
PFE	PORTABLE FIRE EXTINGUISHER
LB	POUND
PSF	POUNDS/SQUARE FOOT
PSI	POUNDS/SQUARE INCH
PC CONC	PRECAST CONCRETE
PREFIN	PREFINISHED
PL	PROPERTY LINE
PROP	PROPOSED
QT	QUARRY TILE
RAD	RADIUS
R.	RISER
REC	RECEPTACLE/ELECTRICAL
REF	REFRIGERATOR
REG	REGISTER
REINF	REINFORCED
REM	REMOVE
REQD	REQUIRED
RES	RESILIENT
RET	RETURN
RA	RETURN AIR
REV	REVISION
RH	RIGHT HAND
ROW	RIGHT OF WAY
RD	ROOF DRAIN
RM	ROOM
RO	ROUGH OPENING
SCH	SCHEDULE
SEC	SECTION
SHTH	SHEATHING
SHT	SHEET
SIM	SIMILAR
SL DR	SLIDING DOOR
SC	SOLID CORE
SCW	SOLID CORE WOOD
SYP	SOUTHERN YELLOW PINE
SPEC	SPECIFICATION
SPR	SPRINKLER
SF	SQUARE FEET
SS	STAINLESS STEEL
STOR	STORAGE
STRUCT	STRUCTURAL
SUSP	SUSPENDED
SYS	SYSTEM
TELE	TELEPHONE
TV	TELEVISION
THK	THICK(NESS)
TCP	THIN COAT PLASTER
THRD	THRESHOLD
THRU	THROUGH
TOIL	TOILET
T&G	TONGUE and GROOVE
TSL	TOP OF SLAB
TOS	TOP OF STEEL
TOW	TOP OF WALL
T.	TREAD
TYP	TYPICAL
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
VB	VAPOR BARRIER
VTR	VENT THRU ROOF
VERT	VERTICAL
VBC	VINYL BASE COVE
VBS	VINYL BASE STRAIGHT
VCT	VINYL COMPOSITION TILE
VWC	VINYL WALL COVERING
WSCT	WAINSCOT
WH	WALL HUNG
WC	WATER CLOSET
WP	WATER PROOF
WWF	WELDED WIRE FABRIC
W.	WIDTH, WIDE
WIN	WINDOW
WG	WIRE GLASS
W/	WITH
W/O	WITHOUT
WD	WOOD
WB	WOOD BASE

SYMBOLS & MATERIALS



BUILDING CODE INFORMATION

THIS SET OF CONSTRUCTION DOCUMENTS ADDRESSES A ROOF REPLACEMENT AT AN EXISTING BUILDING @ THE ABOVE REFERENCED ADDRESS. THERE WILL BE NO ADDITIONAL FLOOR AREA ADDED TO THIS BUILDING. THERE WILL BE NO STRUCTURAL MODIFICATIONS TO THIS BUILDING.

THIS RENOVATION / REPLACEMENT WORK IS BEING DESIGNED UNDER THE 2015 VIRGINIA EXISTING BUILDING CODE (VEBC), CHAPTER 6 "ALTERATIONS– LEVEL 1", WHICH INCLUDES THE REMOVAL AND REPLACEMENT OF EXISTING MATERIALS, EQUIPMENT, ETC. WITH NEW MATERIALS, EQUIPMENT, ETC. THAT SERVE THE SAME PURPOSE.

CODE ANALYSIS
CODE EDITION: 2015 VEBC (2015 IEBC AND IBC w/ Virginia Amendments)
EXISTING BUILDING USE GROUP: E/A–3 (NO CHANGE)
EXIST. BLDG. CONSTRUCTION TYPE: 3B (COMBUSTIBLE/NON–PROTECTED) W/ SOLID MASONRY WALLS
EXISTING BUILDING SQUARE FOOTAGE: 16,100 SF±
EXISTING ROOF AREA (RENOVATION AREA): 7,545 SF±

VEBC 601.4: ENERGY CONSERVATION – NO UPGRADE REQUIRED TO EXISTING BUILDING ENVELOPE ELEMENTS OTHER THAN ROOF INSULATION (ROOFING REPLACEMENT DOES NOT AFFECT EXISTING WALLS, WINDOWS, DOORS, ETC.)

VEBC 602.2: ALL NEW WORK AND SHALL MAINTAIN EXISTING LEVEL OF FIRE PROTECTION AND EXISTING LEVEL OF PROTECTION OF MEANS OF EGRESS.

VEBC 602.3 ALL NEW MATERIALS SHALL COMPLY WITH VEBC SECTIONS 302 AND 602.3.1 THROUGH 602.3.5.

GENERAL CONSTRUCTION NOTES

1. SEE PROJECT MANUAL FOR THIS PROJECT FOR ALL SPECIFICATIONS AND PROJECT REQUIREMENTS.

1.2 ALL DESIGNS, CONSTRUCTION, MATERIALS, AND WORKMANSHIP SHALL COMPLY WITH THE 2015 VIRGINIA UNIFORM STATEWIDE BUILDING CODE (VUSBC), 2015 VIRGINIA EXISTING BUILDING CODE (VEBC) AND 2015 VIRGINIA CONSTRUCITON CODE (VCC) AS A MINIMUM LEVEL OF CONSTRUCTION DETAIL AND QUALITY. ALL WORK INCLUDED IN THE CONSTRUCTION OF THIS PROJECT SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE CODE. BY COMMENCING CONSTRUCTION, CONTRACTOR ACKNOWLEDGES UNDERSTANDING OF THE VUSBC AND AGREES TO INCORPORATE ALL REQUIRED ELEMENTS, WHETHER INDICATED WITHIN THE DOCUMENTS OR NOT.

1.3 CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR SAFETY PRECAUTIONS AND PROGRAMS AS THEY RELATE TO THE WORK OF THIS PROJECT.

1.4 CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, ENGINEERING, PERMITTING AND ERECTION OF ALL TEMPORARY SCAFFOLDING, HOISTS, BRACING, FORM WORK, SHEETING, SHORING AND UNDERPINNING NECESSARY TO PERFORM THE WORK. TEMPORARY BRACING, SHEETING, SHORING, ETC., REQUIRED TO ENSURE THE STRUCTURAL INTEGRITY/STABILITY OF THE EXISTING BUILDING, SIDEWALKS, UTILITIES, ETC. DURING CONSTRUCTION SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE COMMONWEALTH OF VIRGINIA.

1.5 ALL PUBLIC AREAS SHALL REMAIN ACCESSIBLE TO THE HANDICAPPED, IN ACCORDANCE WITH VIRGINIA UNIFORM STATEWIDE BUILDING CODE (VUSBC) AND AMENDMENTS AND APPLICABLE AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES. PLEASE NOTE: ROOF REPLACEMENT DOES NOT REQUIRE ANY MODIFICATIONS FOR ACCESSIBLITY UPGRADES.

1.6 CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DRAWING DIMENSIONS PRIOR TO COMMENCING ANY WORK. ANY INCONSISTENCIES WITH THE DRAWINGS SHALL BE REPORTED TO THE ARCHITECT IN WRITING PRIOR TO COMMENCING WORK. FAILURE TO REPORT INCONSISTENCIES WILL RELIEVE ARCHITECT AND OWNER FROM ANY CLAIM FOR ADDITIONAL WORK REQUIRED RELATED TO THE INCONSISTENCY.

1.7 UNDER NO CIRCUMSTANCES SHALL THESE DRAWINGS BE USED FOR SHOP DRAWINGS.

1.8 WORK NOTED AS "N.I.C." IS NOT PART OF THIS CONTRACT, AND WILL BE HANDLED BY OWNER UNDER SEPARATE CONTRACT. ALL ITEMS NOT NOTED AS THUS ON DRAWINGS SHALL BE ASSUMED TO BE PART OF CONTRACT WORK.

1.9 WORK NOT INDICATED ON A PART OF THE DRAWINGS, BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PIECES, SHALL BE REPEATED.

1.10 CONTRACTOR SHALL BE RESPONSBILE FOR ALL NECESSARY TEMPORARY UTILITIES AND SUPPORT FACILITIES NECESSARY TO COMPLETE THE WORK. ALL REQUIRED FEES FOR TEMPORARY SERVICES SHALL BE INCLUDED IN THE CONTRACT. PROVIDE ANY NECESSARY TEMPORARY CONSTRUCTION REQUIRED TO MAINTAIN OWNER/TENANT/PATRON USE OF THE EXISTING PROPERTY OUTSIDE OF THE LIMITS OF CONSTRUCTION.

1.11 SUBSTITUTIONS FOR SPECIFIED MATERIALS AND PRODUCTS SHALL BE MADE ONLY WITH PRIOR APPROVAL FROM THE ARCHITECT.

1.12 ALL ROOF ACCESS SHALL BE FROM EXTERIOR OF BUILDING VIA CONTRACTOR'S LADDER. THE EXISTING ROOF HATCH SHALL NOT BE USED FOR ANY ROOF ACCESS DURING CONSTRUCTION.

1.13 ASBESTOS CONTAINING MATERIALS (ACM'S) ARE PRESENT IN THE AFFECTED ROOF REPLACEMENT AREAS AND SHALL BE REMOVED AS REQUIRED TO COMPLETE THE WORK. SEE SURVEY FOR ACM'S INCLUDED IN THE PROJECT MANUAL.

1.14 CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS, METHODS AND SCHEDULING OF WORK AS REQUIRED TO MAINTAIN A COMPLETELY DRY BUILDING BELOW RE–ROOFING PROCESS.

SEE PROJECT MANUAL FOR ADDITIONAL CONSTRUCTION NOTES.

DRAWING INDEX

REVISIONS: 7 6 5 4 3 2 1 — DATE

PROJECT DIRECTORY

BUILDING OWNER
COUNTY OF ROANOKE
Contact: Ronald Riquelmy
Roanoke County General Services
1216 Kessler Mill Road
Salem, Virginia 24153
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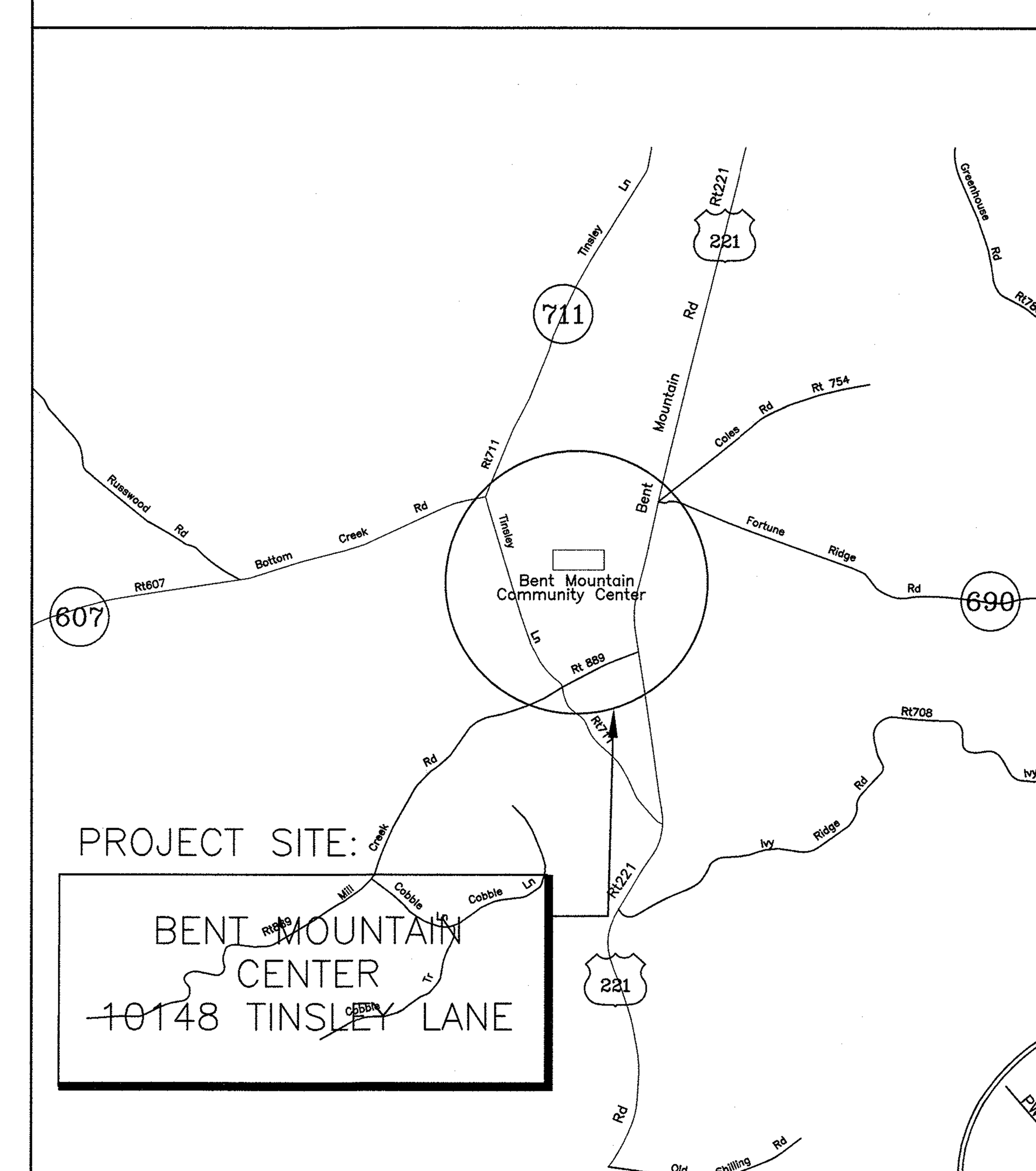
Fax: 540-387-6112

ARCHITECT
Balzer and Associates, Inc.
Contact: Robert Pilkington
1208 Corporate Circle
Roanoke, Virginia 24018
Phone: 540-772-9580
Fax: 540-772-9350

VICINITY MAP

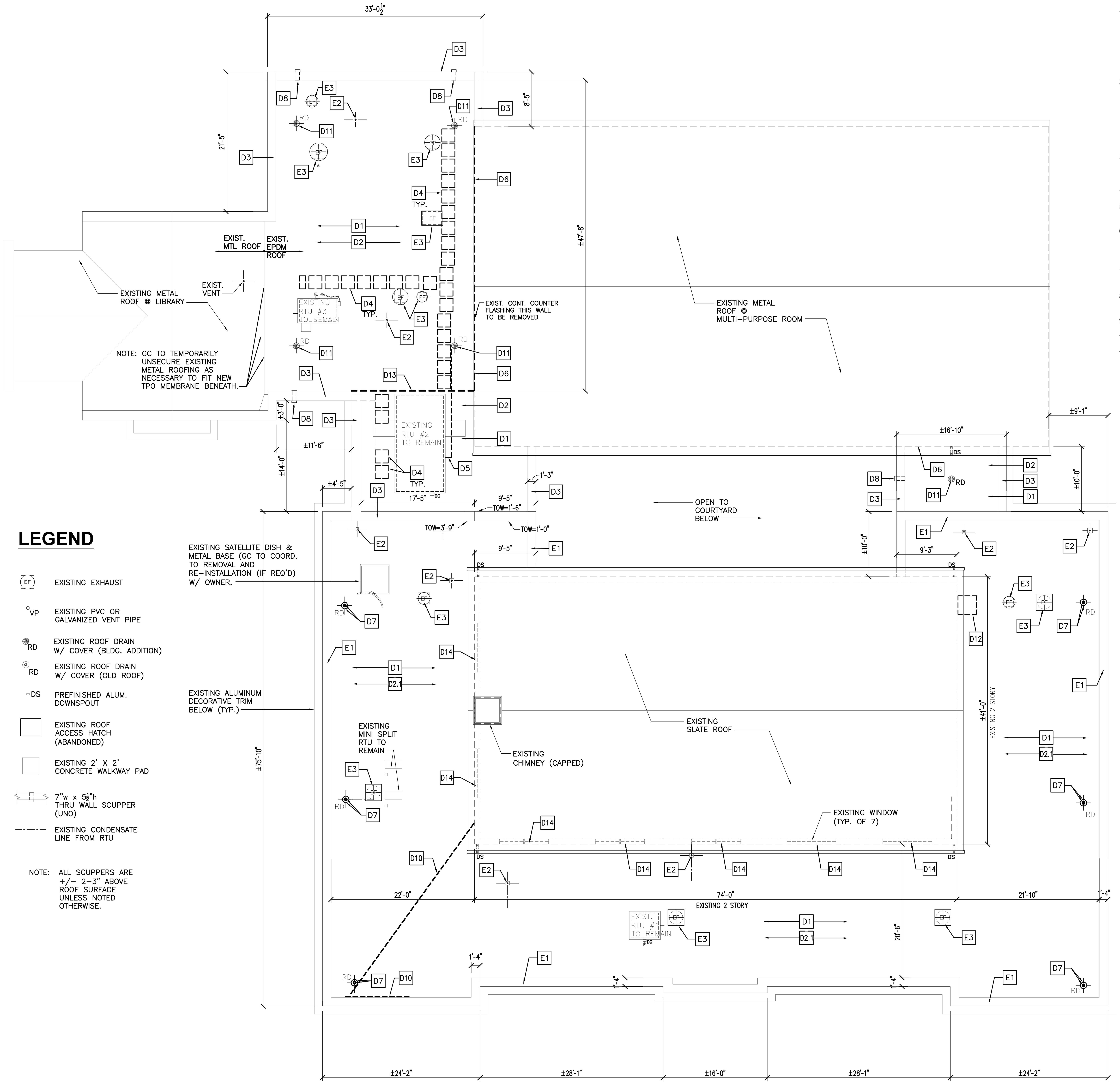


BENT MOUNTAIN CENTER
ROOF REPLACEMENT
COVER
10148 TINSLEY LANE
BENT MOUNTAIN, VIRGINIA 24059

DRAWN BY	BSH
DESIGNED BY	BSH/RWP
CHECKED BY	RWP
DATE	10/2/2019
SCALE	AS INDICATED
REVISIONS	

T1.1

PROJECT NO 03160018.00



1 D1.1 **ROOF DEMOLITION PLAN**

SCALE = 1/8"=1'-0"

DEMOLITION GENERAL NOTES:

1. ASBESTOS CONTAINING MATERIAL (ACM'S) ARE PRESENT IN EXISTING BUILT-UP ROOFING MATERIALS BEING REMOVED IN AFFECTED ROOF REPLACEMENT AREAS. SEE SURVEY FOR ACM'S INCLUDED IN PROJECT MANUAL FOR LOCATIONS / TYPES OF ACM'S. CONTRACTOR SHALL REVIEW REPORT CAREFULLY AND DETERMINE IF ANY AND EXTENT OF ACM'S WILL BE DISTURBED AS PART OF THEIR REQUIRED WORK NECESSARY TO PERFORM THE WORK SHOWN IN THESE DRAWINGS. ALL ACM'S IN AFFECTED / DISTURBED ROOF AREAS SHALL BE REMOVED AND HANDLED PER ALL FEDERAL, STATE AND LOCAL CODES.
2. LEAD-BASED PAINT IS PRESENT IN EXTERIOR PAINTED FINISHES AROUND AREAS AFFECTED BY ROOF-REPLACEMENT PROCESSES AND POTENTIALLY ON ITEMS TO BE REMOVED/DISTRUBED AS PART OF RE-ROOFING PROCESSES. SEE SURVEY FOR LEAD-BASED PAINT INCLUDED IN PROJECT MANUAL FOR LOCATIONS OF LEAD-BASED PAINT. CONTRACTOR SHALL REVIEW REPORT CAREFULLY AND DETERMINE IF ANY LEAD-BASED PAINT WILL BE DISTURBED AS PART OF THEIR REQUIRED WORK NECESSARY TO PERFORM THE WORK SHOWN IN THESE DRAWINGS. ALL LEAD-BASED PAINT IN AFFECTED / DISTURBED AREAS SHALL BE REMOVED AND HANDLED PER ALL FEDERAL, STATE AND LOCAL CODES.
3. RESTORE EXPOSED FINISHES OF PATCHED AREAS AND WHERE NECESSARY EXTEND FINISH RESTORATION INTO RETAINED ADJOINING WORK IN A MANNER WHICH WILL ELIMINATE EVIDENCE OF PATCHING AND REFINISHING.
4. ALL ITEMS SHOWN AS [- - -] ARE TO BE REMOVED (EXCEPT AS NOTED.)
5. THE CONTRACTOR IS REQUIRED TO MAKE FIELD INSPECTIONS TO VERIFY EXISTING CONDITIONS.
6. ALL EXISTING DIMENSION NOTES ON THIS PLAN ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS PRIOR TO NEW WORK. IF THE CONTRACTOR FINDS ANY DISCREPANCY BETWEEN EXISTING CONDITION AND DRAWING, CONTRACTOR MUST NOTIFY THE ARCHITECT IMMEDIATELY AND REQUEST CLARIFICATION.
7. CONTRACTOR MUST REMOVE EXISTING FINISHES AS NECESSARY PRIOR TO INSTALLATION OF NEW FINISHES.
8. DO NOT CUT AND PATCH WORK IN A MANNER THAT WOULD RESULT IN SUBSTANTIAL VISUAL EVIDENCE OF CUT AND PATCH WORK.
9. USE MATERIALS FOR CUTTING AND PATCHING THAT ARE IDENTICAL TO EXISTING MATERIALS.
10. ALL DEMOLISHED MATERIAL SHALL BE REMOVED FROM SITE U.N.O.
11. QUANTITIES: CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING QUANTITIES OF ALL MATERIALS TO BE DEMOLISHED AND REMOVED FROM SITE, INCLUDING STONE BALLASTS, ROOFING MEMBRANE, INSULATION AND ANY/ALL ACCESSORIES. MATERIAL QUANTITIES SHALL BE FACTORED INTO CONTRACTOR'S BASE BID.

DEMOLITION KEYNOTES

D1	REMOVE EXISTING GRAVEL BALLAST.
D2	REMOVE EXISTING LOOSE-LAID MEMBRANE ROOFING AND RIGID INSULATION.
D2.1	REMOVE EXISTING BUIILT-UP ROOFING IN ENTIRELY DOWN TO EXISTING WOOD DECKING.
D3	REMOVE EXISTING METAL COPING FROM EXISTING PARAPET. INSPECT ALL EXISTING P.T. BLOCKING. PREP FOR NEW PREFINISHED COPING W/ INTEGRAL DRAINAGE CHAIR.
D4	REMOVE EXISTING WALKWAY PAD.
D5	REMOVE EXISTING RTU CONDENSATE DRAIN FOR INSTALLATION OF NEW ROOF. REPLACE WITH NEW CONDENSATE LINE AS NEEDED.
D6	REMOVE EXISTING TERMINATION BAR AT WALL; REMOVE EXISTING ROOF MEMBRANE UP WALL.
D7	REMOVE EXISTING CAST IRON STRAINER AND EXISTING ROOF DRAIN (EXISTING DRAIN PIPE BELOW TO REMAIN).
D8	REMOVE EXISTING SCUPPER AND SALVAGE/STORE FOR RE-INSTALL WITH NEW ROOF INSTALLATION.
D9	(NOT USED)
D10	REMOVE EXISTING CONDUIT, LOW VOLTAGE WIRING AND PVC CONDUIT AT EXISTING PARAPET WALL (GC TO VERIFY CIRCUIT(S) ARE "DEAD" AT SOURCE).
D11	REMOVE EXISTING CAST IRON STRAINER AT EXISTING ROOF DRAIN; TEMPORARILY REMOVE EXISTING DRAIN AND RE-INSTALL AFTER DECKING REPLACEMENT, WHERE REQ'D.
D12	REMOVE EXISTING CURB FOR ABANDONED ROOF HATCH / ACCESS PROVIDE WOOD DECKING INFILL AND FRAMING AT REMAINING OPENING (APPROX. 2'-10" X 2'-10" OPNG.).
D13	REMOVE EXISTING GRAVEL STOP.
D14	REMOVE EXISTING GALVANIZED WINDOW SILL FLASHING AND EXISTING STORM WINDOW (SEE DETAIL 9/A1.2).

KEYNOTES - EXISTING ITEMS TO REMAIN

E1	EXISTING PRECAST CONCRETE COPING TO REMAIN.
E2	EXISTING GALVANIZED VENT PIPE TO REMAIN. GC TO COORD. REMOVAL / RE-INSTALLATION IF REQUIRED FOR RE-ROOFING PROCESSES.
E3	EXISTING ROUND OR RECTANGULAR EXHAUST VENT/FAN AND CURB TO REMAIN. GC TO COORD. REMOVAL / RE-INSTALLATION IF REQUIRED FOR RE-ROOFING PROCESSES.

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ROOF REPLACEMENT
EXISTING ROOF PLAN
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BENT MOUNTAIN, VIRGINIA 24059

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DATE	10/2/2019
SCALE	AS INDICATED
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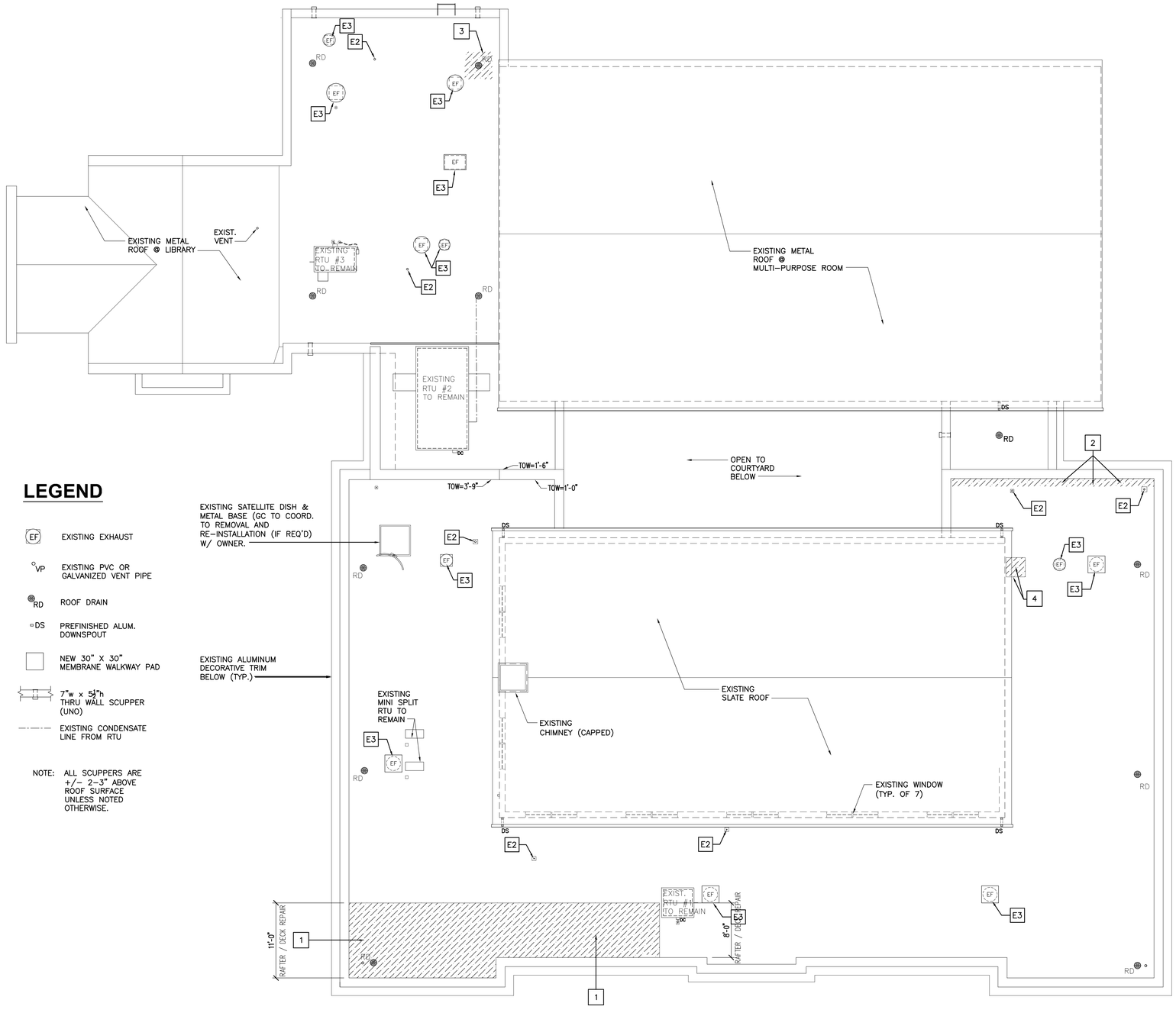

LEGEND

- EF — EXISTING EXHAUST
- VP — EXISTING PVC OR GALVANIZED VENT PIPE
- RD — ROOF DRAIN
- DS — PREFINISHED ALUM. DOWNSPOUT
- NEW 30" X 30" MEMBRANE WALKWAY PAD
- 7"w x 5½"h THRU WALL SCUPPER (UNO)
- EXISTING CONDENSATE LINE FROM RTU

NOTE: ALL SCUPPERS ARE +/- 2-3" ABOVE ROOF SURFACE UNLESS NOTED OTHERWISE.

STRUCTURAL ROOF DECK REPLACEMENT PLAN

1 / A1.0 SCALE = 1/8"=1'-0"

STRUCTURAL DECK KEYNOTES THIS SHEET

1	SISTER NEW 2 X 4'S TO TOP OF EXISTING 2 X ROOF RAFTERS, EXTENDING FOR ±11-0" BACK FROM EXTERIOR WALL. REPLACE EXISTING DECKING AS REQ'D'. (± 425 S.F. AREA SHOWN).
2	REPLACE +/-1'-0" W X APPROX. 30'-0" L OF EXISTING DECKING BACK FROM WALL. REPLACE 2 X 4 BLOCKING / PURLINS PERPENDICULAR TO EXIST. WALL CONT. (APPROX. +/- 4'-0" LONG) AS REQ'D.
3	REPLACE EXISTING DECKING ±4'-0" ALL DIRECTIONS AROUND EXISTING ROOF DRAIN.
4	PROVIDE NEW FRAMING AND DECKING AT REMOVED ROOF HATCH. PROVIDE NEW 2 X WOOD FRAMING ALL SIDES OF EXISTING OPENING, "SISTER" TO EXISTING AS REQ'D.

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ROOF REPLACEMENT

ROOF DECKING REPLACEMENT PLAN

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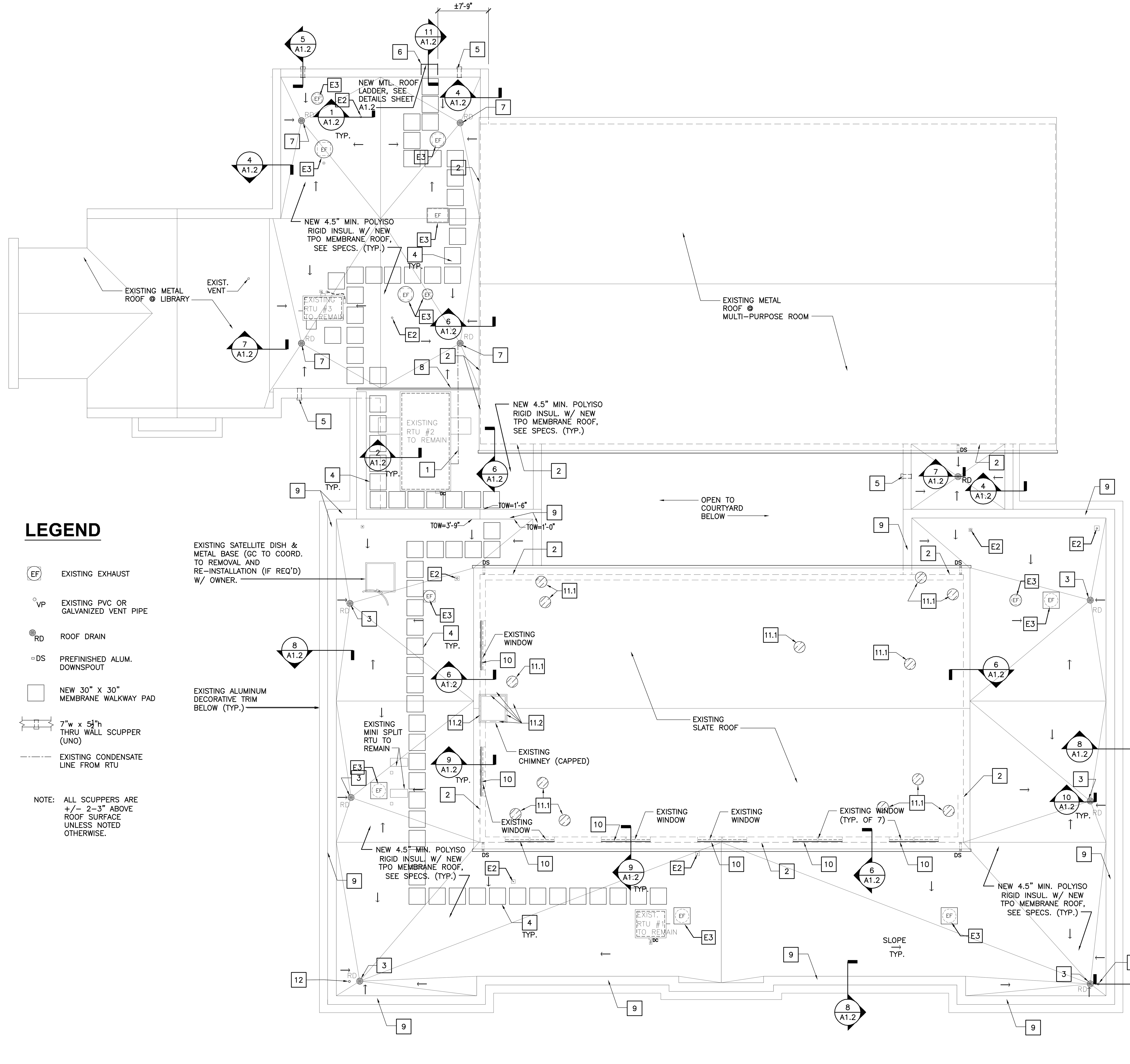


1 A1.1 **RENOVATION ROOF PLAN**
SCALE = 1/8"=1'-0"

LEGEND

- EF — EXISTING EXHAUST
- VP — EXISTING PVC OR GALVANIZED VENT PIPE
- RD — ROOF DRAIN
- DS — PREFINISHED ALUM. DOWNSPOUT
- NEW 30" X 30" MEMBRANE WALKWAY PAD
- 7"w x 5½"h THRU WALL SCUPPER (UNO)
- EXISTING CONDENSATE LINE FROM RTU

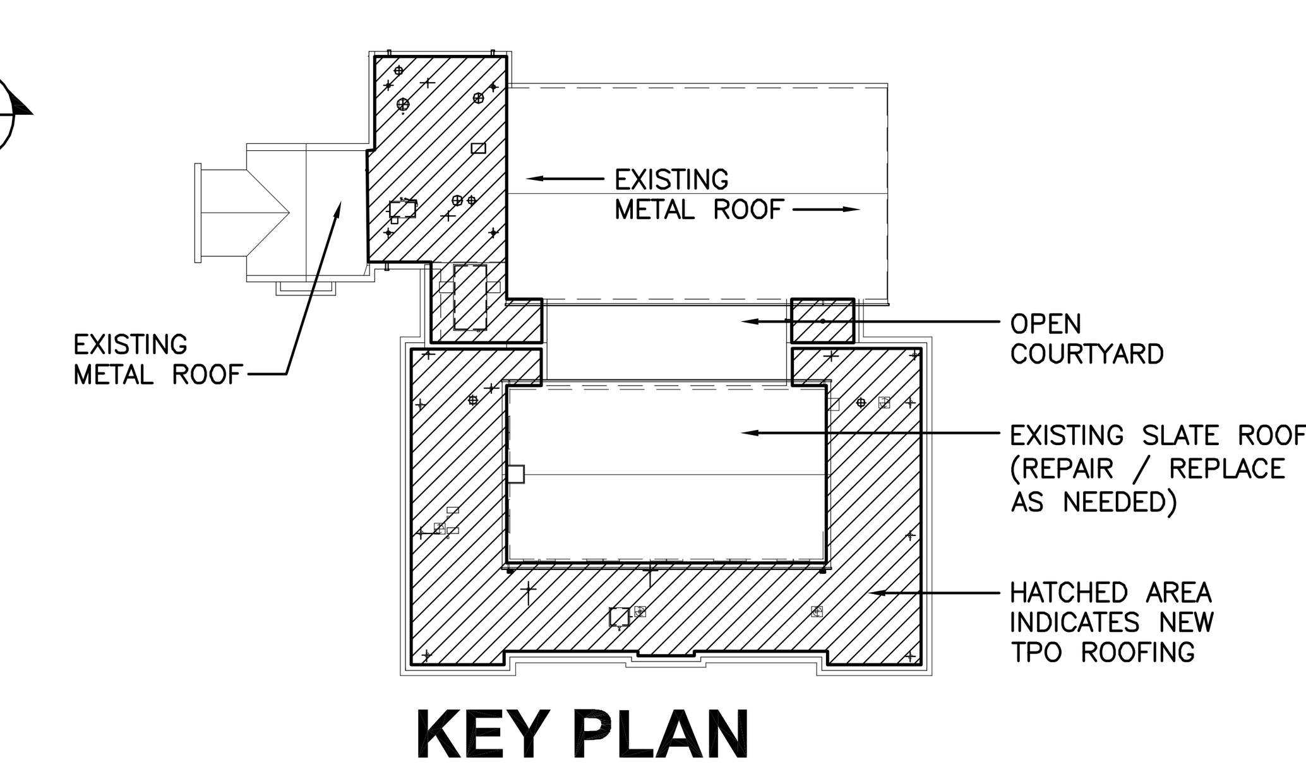
NOTE: ALL SCUPPERS ARE +/- 2-3" ABOVE ROOF SURFACE UNLESS NOTED OTHERWISE.

ROOF PLAN GENERAL NOTES:

1. ROOFING MEMBRANE SYSTEM TO BE EXTENDED UP PARAPET AND TERMINATED UNDER EXISTING METAL COPING. ALL ROOFING PROCESSES, INCLUDING REQUIRED MATERIALS FOR INSTALLATION, PRODUCT SPECIFICATIONS AND INSTALLATION OF ROOFING ASSEMBLY TO BE PER ROOFING MEMBRANE MANUFACTURER'S STRICT GUIDELINES.
2. ALL METAL WORK SHALL CONFORM TO LATEST EDITION OF "SMACNA" STANDARD DETAILS.
3. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ROOF PENETRATIONS WITH MECHANICAL & PLUMBING DRAWINGS, INCLUDING ROOF-MOUNTED MECH. UNITS, EXHAUST FANS, VENT PIPES, ETC. PRIOR TO CONSTRUCTION. REPORT ANY INCONSISTENCIES IMMEDIATELY TO ARCHITECT.
4. PROVIDE ALL REQUIRED INSULATED ROOF BOOTS, CURBS AND WALKWAY PADS TO & AROUND ALL ROOF-MOUNTED EQUIPMENT.
5. RIGID INSULATION TO MEET R-30 (AVERAGE ACROSS ROOF), THICKNESS TO BE AS REQUIRED (5" POLYISO PER SPECS.). ROOF SLOPE SHALL BE 1/4" PER 12" MINIMUM FOR ALL MAIN ROOF SLOPES SHOWN, BUT MAY BE REDUCED IF REQUIRED PER IBC 1510.1, EXCEPTION (RE-ROOFING); CONTRACTOR SHALL VERIFY IN FIELD THAT NEW ROOF SLOPE WILL PROVIDE POSITIVE DRAINAGE TO EXISTING ROOF DRAINS.
6. ANY NEW "CRICKETS" FORMED IN RIGID INSULATION ARE PREFERED TO BE 1/4" PER 12", BUT SHALL BE A MINIMUM OF 1/8" PER 12". PROVIDE TOP LAYER PROTECTION MATERIAL PER MANUFACTURERS RECOMMENDATIONS.
7. PROVIDE "CRICKETS" AROUND ALL MECHANICAL UNITS, VENTS, ETC. AS REQ.
8. ALL PLUMBING VENTS SHALL BE HELD A MINIMUM OF 10'-0" FROM ANY RTU AIR INTAKE.
9. ALL DIMENSIONS SHOWN TO ROOF-TOP MECHANICAL EQUIPMENT ARE APPROXIMATE, MEASURED TO OUTSIDE EDGE OF PARAPET. CONTRACTOR SHALL COORDINATE EXACT DIMENSIONS REQUIRED WITH MECHANICAL AND FRAMING CONTRACTORS.
10. EXISTING ROOF DRAINAGE SCUPPER, CONTRACTOR REPAIR AS REQ. OR REPLACE WITH SIMILAR SIZE/MATERIAL AND PROVIDE NEW DOWNSPOUT IF REQUIRED.
11. ALL ROOF ACCESS SHALL BE FROM EXTERIOR OF BUILDING VIA CONTRACTOR'S LADDER. THE EXISTING ROOF HATCH SHALL NOT BE USED FOR ANY ROOF ACCESS DURING CONSTRUCTION.
12. ANY REPLACEMENT CAP FLASHING SHALL BE INSTALLED IN INCONSPICUOUS LOCATIONS, CONTRACT COORDINATE LOCATIONS OF ALL CAP FLASHING (EITHER RE-INSTALLED OR NEW) WITH OWNER PRIOR TO INSTALLATION.
13. ALL WORK REQUIRED FOR INSTALLING NEW ROOFING IN GENERAL AND PRIMARY ROOF DRAINS/EMERGENCY DRAINS IN ORIGINAL BUILDING (DETAILS 10 AND 12 ON SHEET A1.2) IS INTENDED TO BE CARRIED OUT FROM ABOVE ROOF. NO INTERIOR BUILDING DEMOLITION WILL BE ALLOWED. AS SUCH, CONTRACTOR SHALL INCLUDE WITH BID ANY NECESSARY DECKING REMOVAL AND REPLACEMENT AS REQUIRED TO INSTALL DRAINS OR OTHERWISE PERFORM ALL WORK SHOWN HEREIN.

ROOF PLAN KEYNOTES THIS SHEET

1	INSTALL NEW CONDENSATE LINE FROM EXISTING RTU TO ROOF DRAIN. MATCH EXISTING LINE ø. PROVIDE NEW PIPE SUPPORTS, SEE SPECS.
2	EXTEND MEMBRANE ROOFING UP EXISTING PARAPET WALL, PROVIDE TERMINATION BAR @ TOP @ MIN. 24" ABOVE ROOF SURFACE (SEE DETAIL 6/A1.2).
3	NEW ROOF DRAIN, PROVIDE NEW STRAINER TO MATCH EXIST. AS REQUIRED, RECONNECT TO EXIST. DRAIN PIPE.
4	NEW 30"x30" MEMBRANE RUBBER WALKWAY PAD. (MFR. STANDARD)
5	RE-INSTALL EXIST. THRU-WALL SCUPPER OR REPLACE W/ NEW, SEE DETAIL ON SHEET A1.2
6	NEW STEEL LADDER W/ GALV. HINGED SECURITY GATE (SEE DETAIL 11/A1.2).
7	RE-INSTALL EXISTING STRAINER AT EXISTING ROOF DRAIN.
8	INSTALL NEW GALVANIZED GRAVEL STOP AT EXISTING ROOF EDGE.
9	INSTALL NEW SLOPED PRE-FINISHED METAL COPING ON EXISTING PRECAST CONCRETE CAP (SEE DETAIL 8/A1.2).
10	INSTALL NEW CONT. P.T. 2 X NAILER (AT WINDOW SILL AND HEAD), 3/4" P.T. PLYWD AND 5/16" CEMENTITIOUS PANEL AT ENTIRE EXISTING WINDOW OPENING. SEE DETAIL 9/A1.2.
11.1	REPAIR / REPLACE EXISTING SLATE ROOF AT AREAS SHOWN. GC TO INSPECT TOP PORTIONS OF ROOF SLOPE AND REPAIR AS REQ'D. ± 4-6 TILES AT EACH REPLACEMENT AREA.
11.2	REMOVE EXISTING FLASHING AT EXISTING BRICK CHIMNEY. PROVIDE NEW FLASHING AND REPAIR / REPLACE ANY ADJACENT SLATE TILES AS REQ'D.
12	NEW EMERGENCY OVERFLOW ROOF DRAIN @ ORIG. BLDG. ROOF, SEE DETAIL 12/A1.2.



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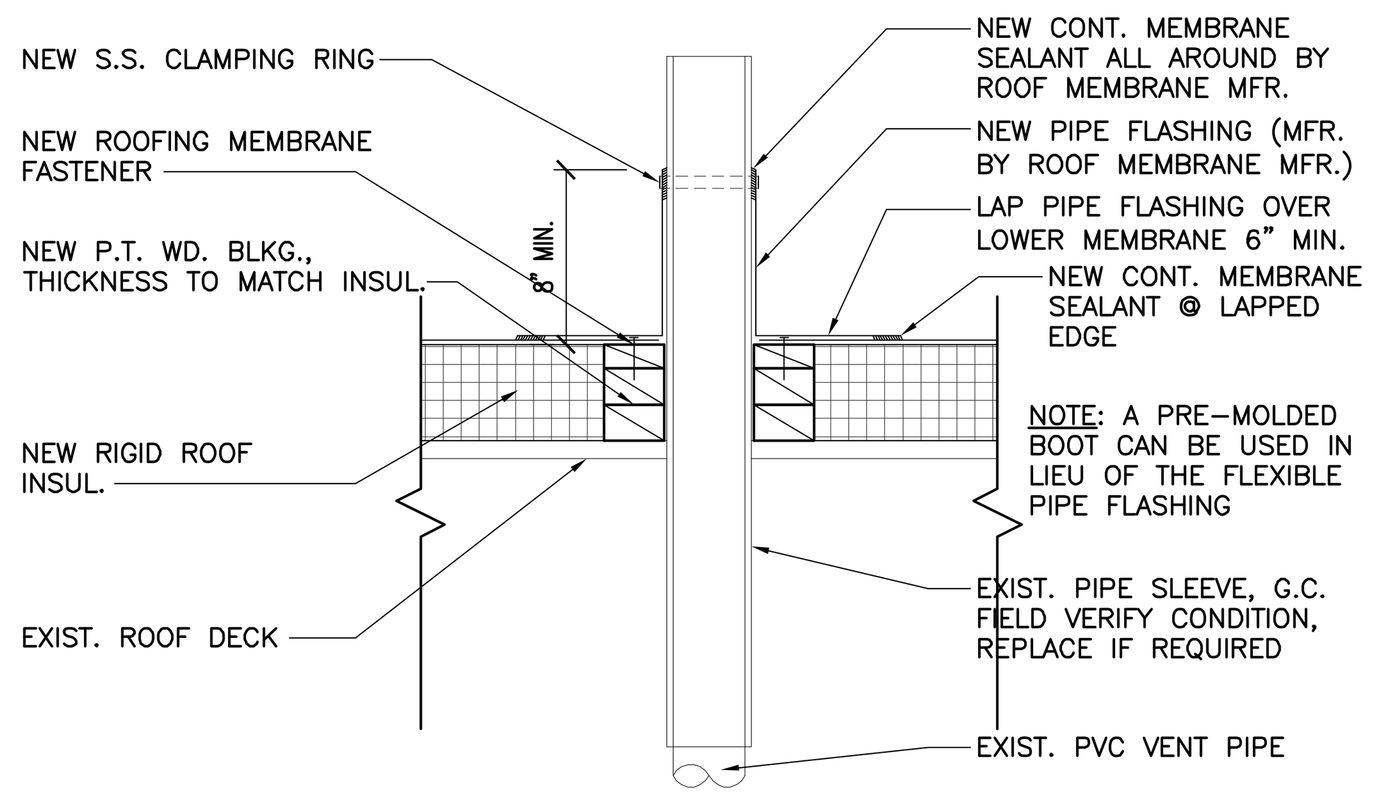
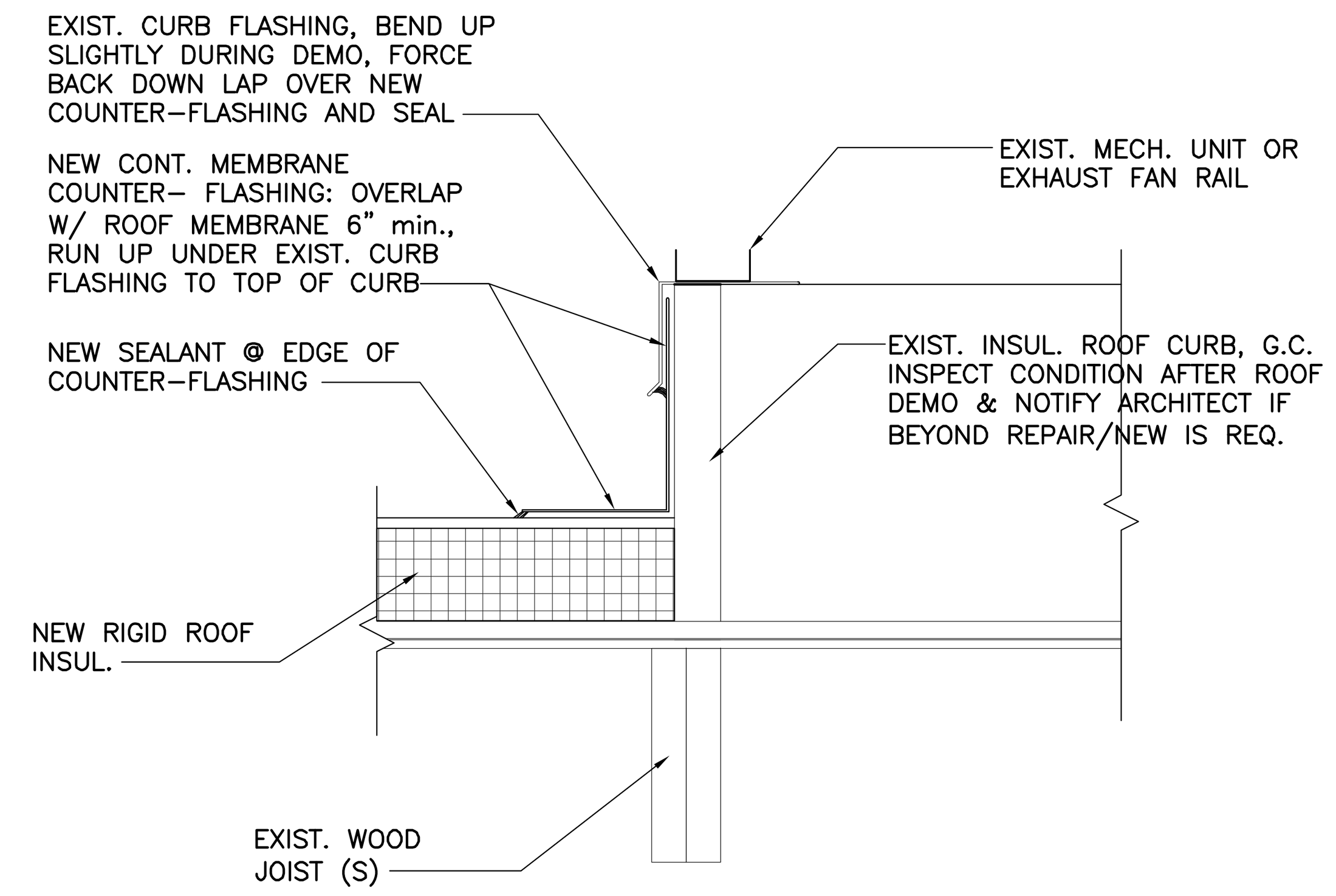


1 A1.2 **VENT STACK DETAIL**
SCALE: 1-1/2"= 1'-0"



2 A1.2 **RTU CURB DETAIL**
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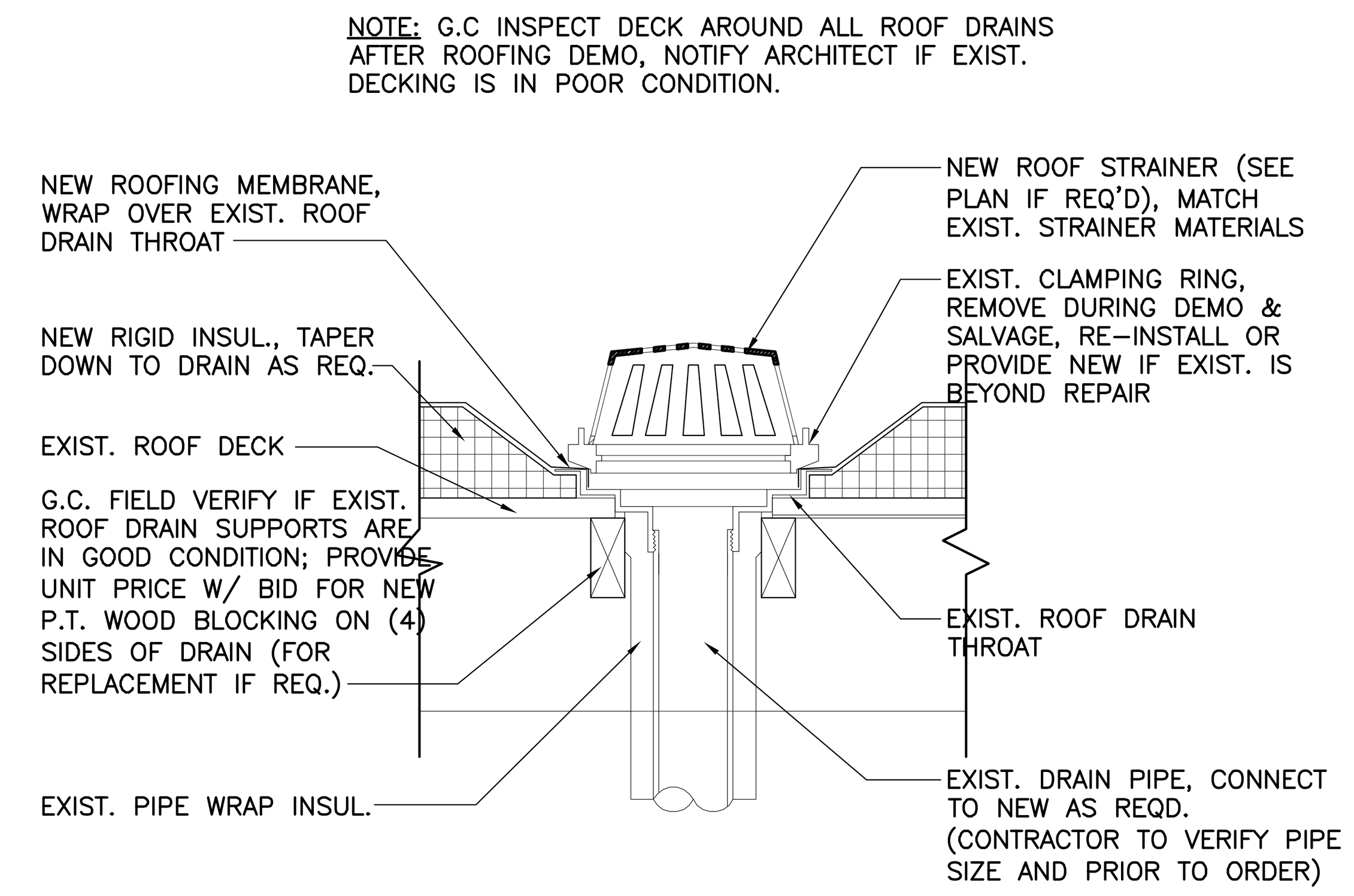
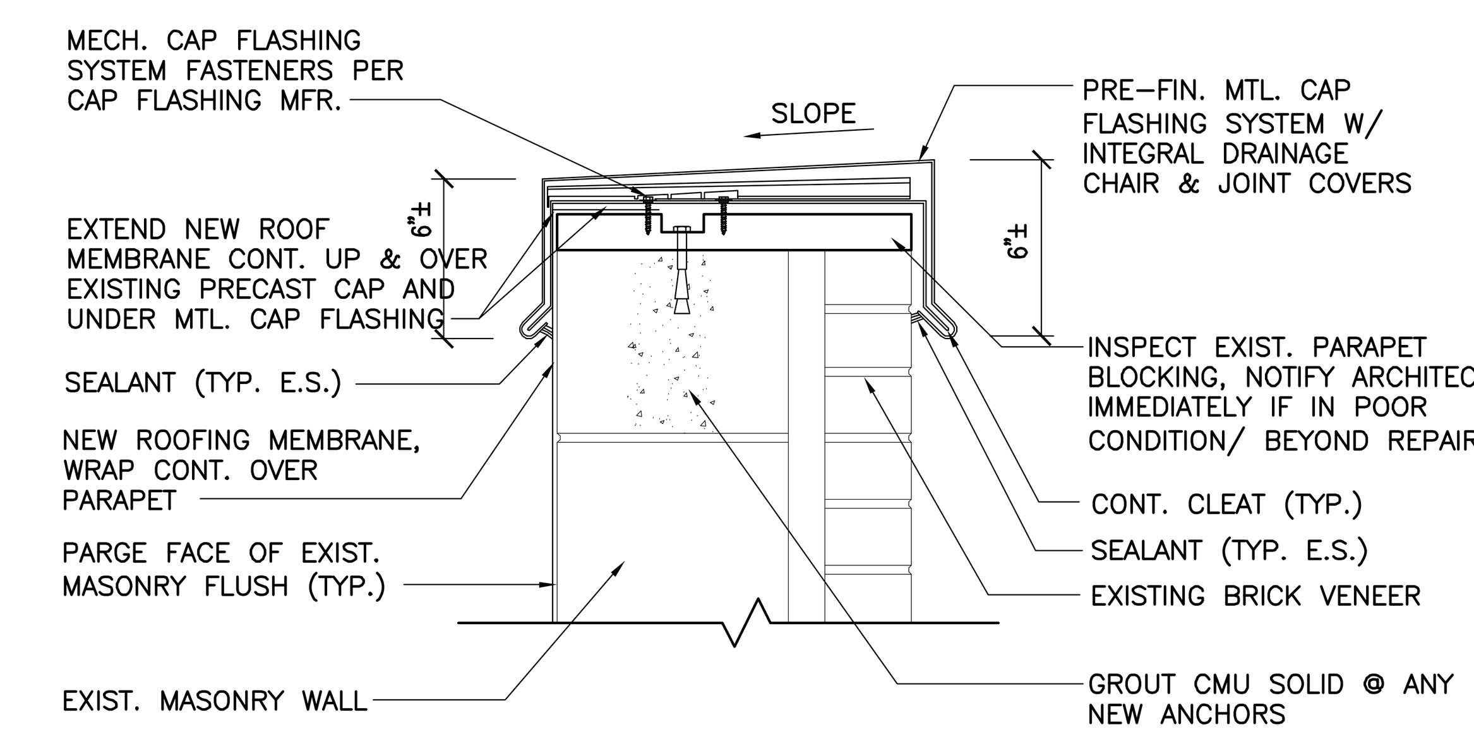
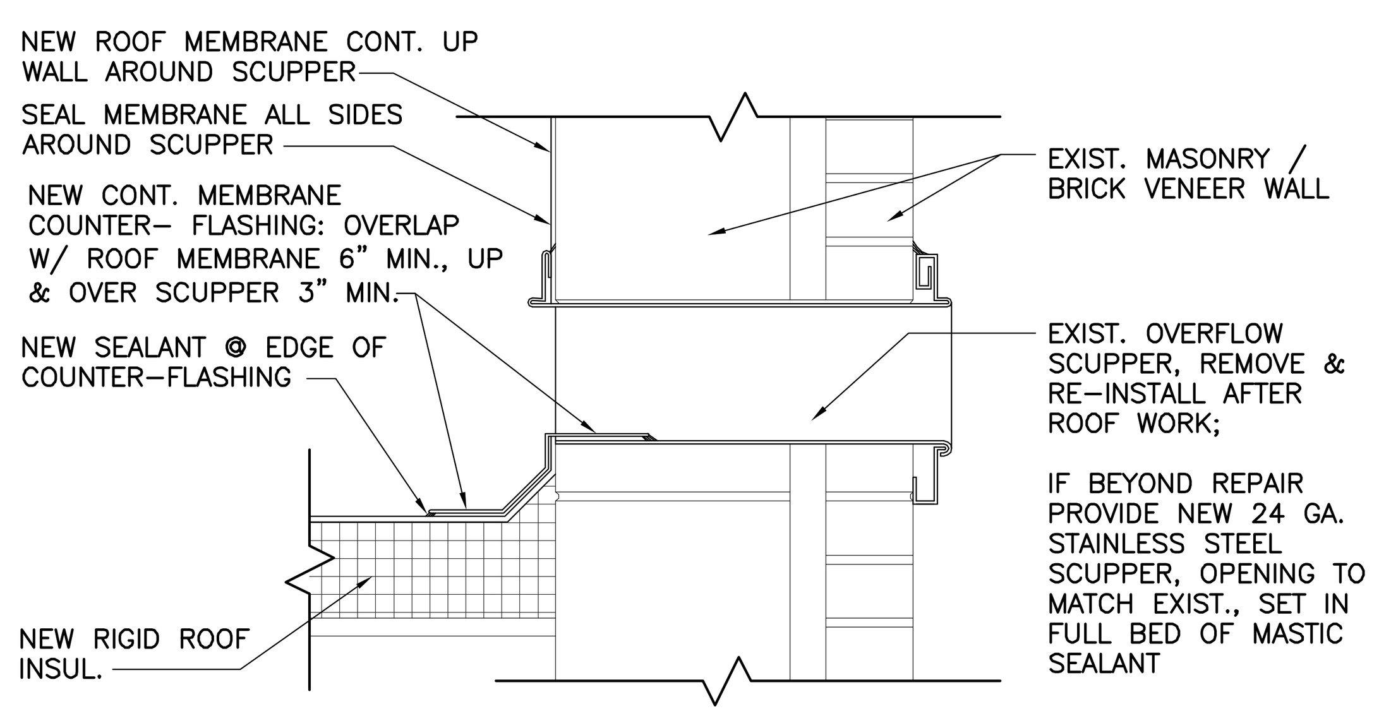


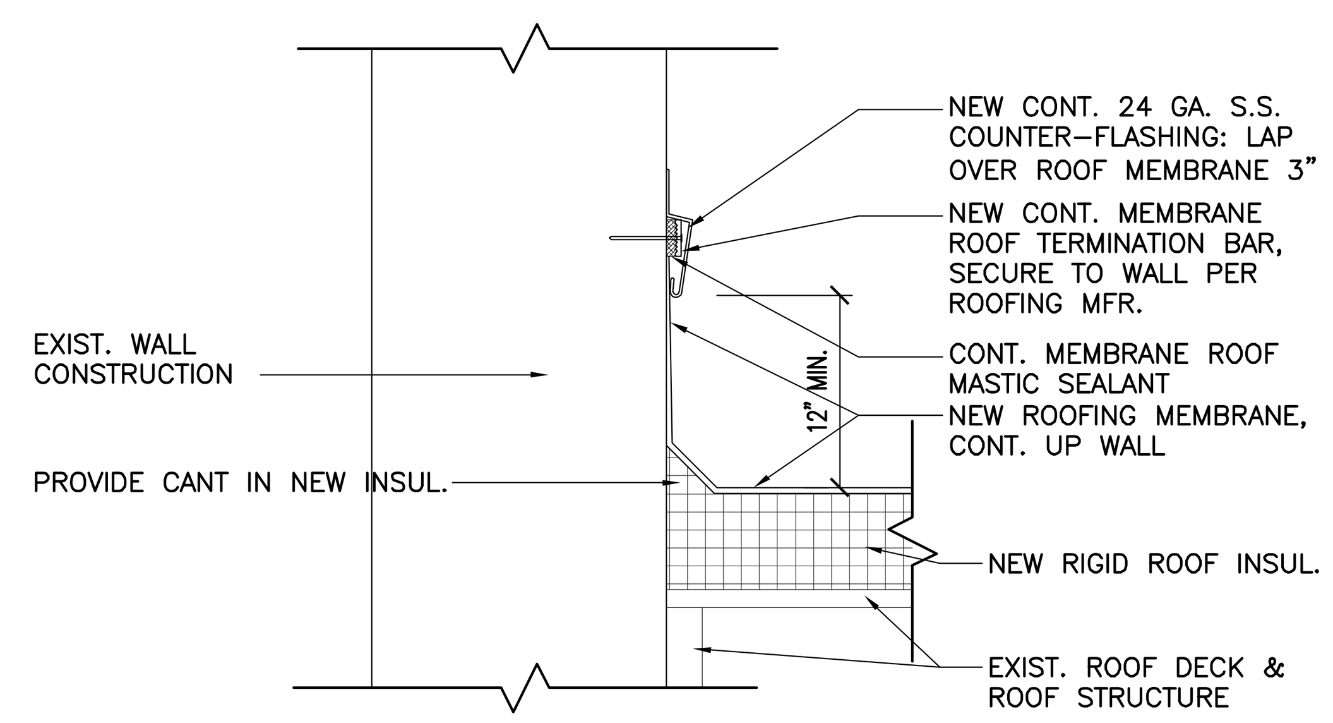
3 A1.2 **(1990 ADDITION) ROOF DRAIN DETAIL**
SCALE: 1-1/2"= 1'-0"



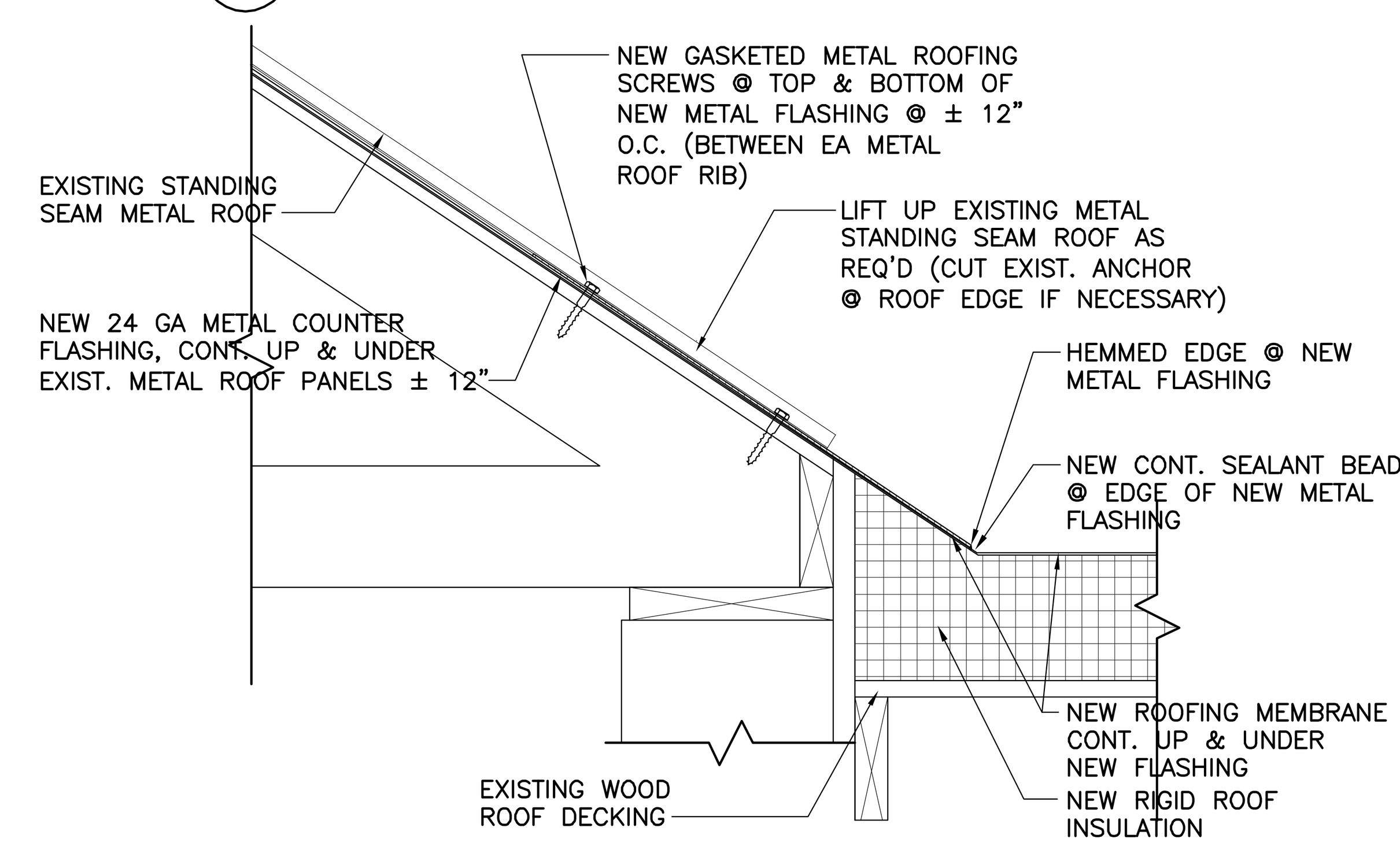
4 A1.2 **(1990 ADDITION) EXISTING PARAPET DETAIL**
SCALE: 1-1/2"= 1'-0"



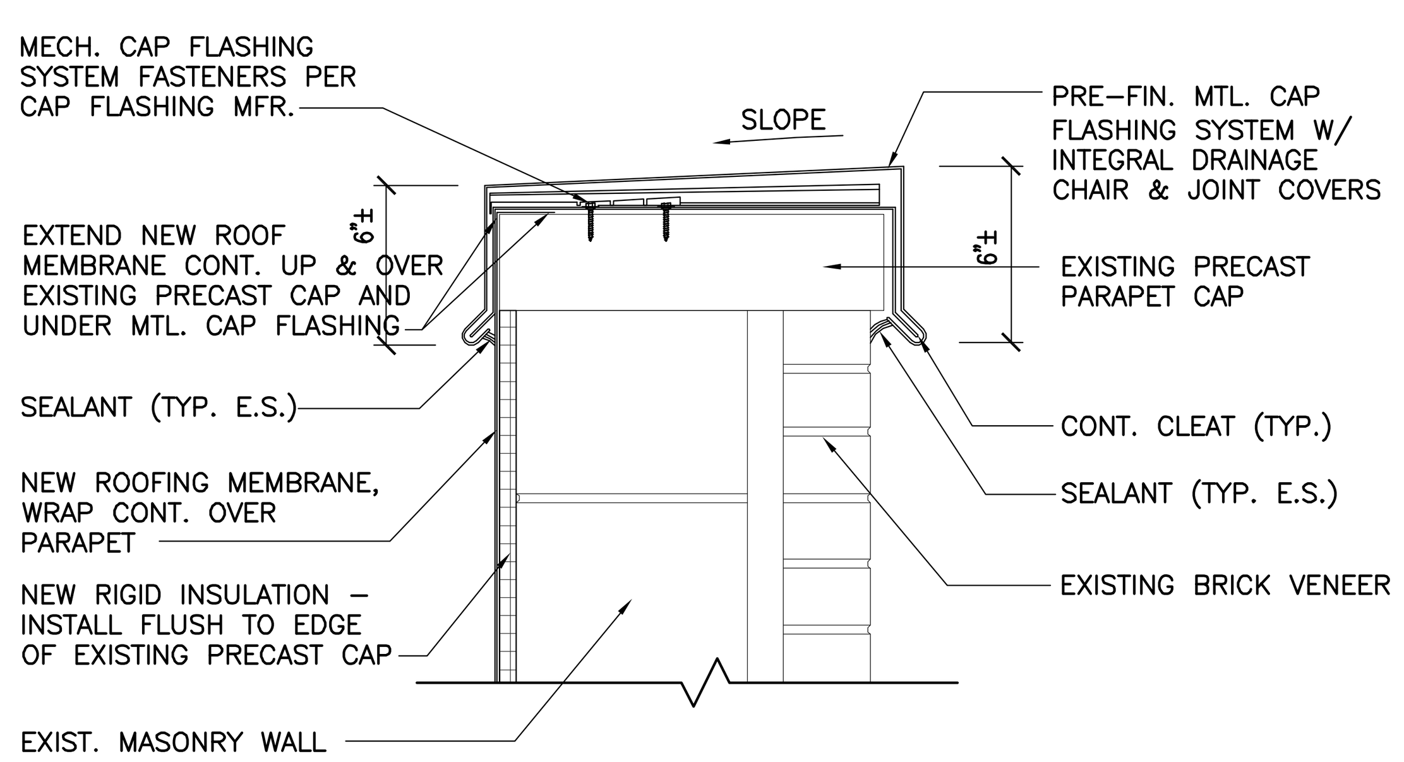
5 A1.2 **(1990 ADDITION) ROOF SCUPPER DETAIL**
SCALE: 1-1/2"= 1'-0"



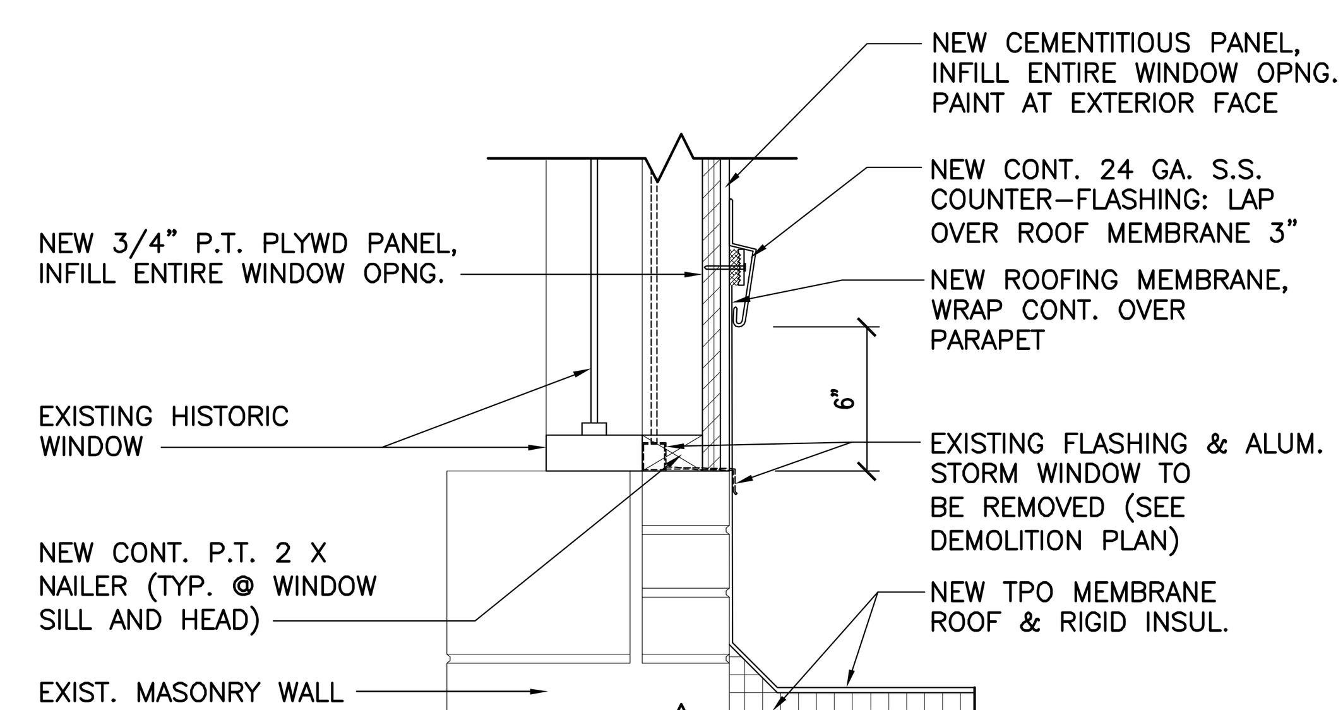
6 A1.2 **TERMINATION BAR/ FLASHING DETAIL**
SCALE: 1-1/2"= 1'-0"



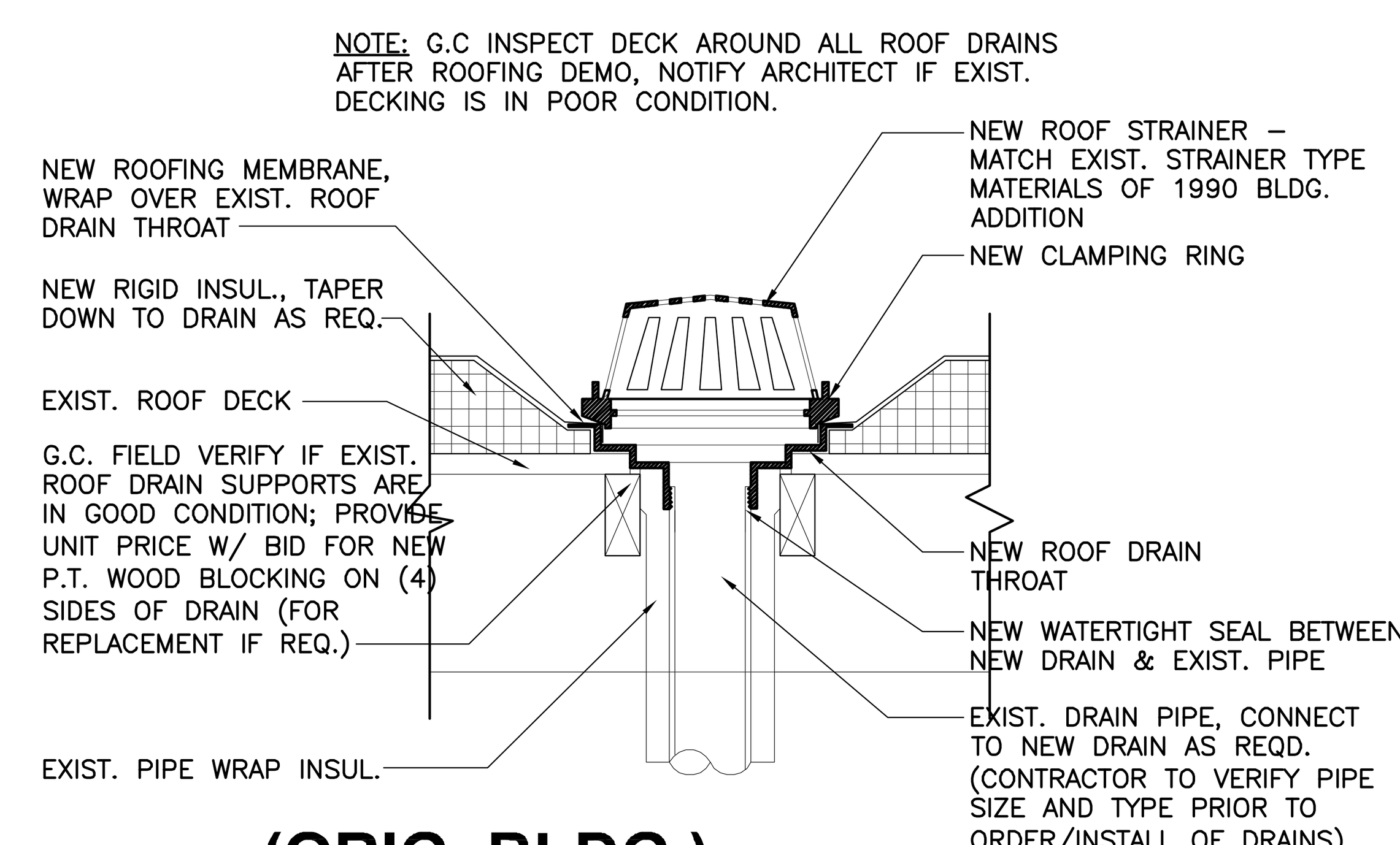
7 A1.2 **DETAIL @ SLOPED METAL ROOF**
SCALE: 1-1/2"= 1'-0"



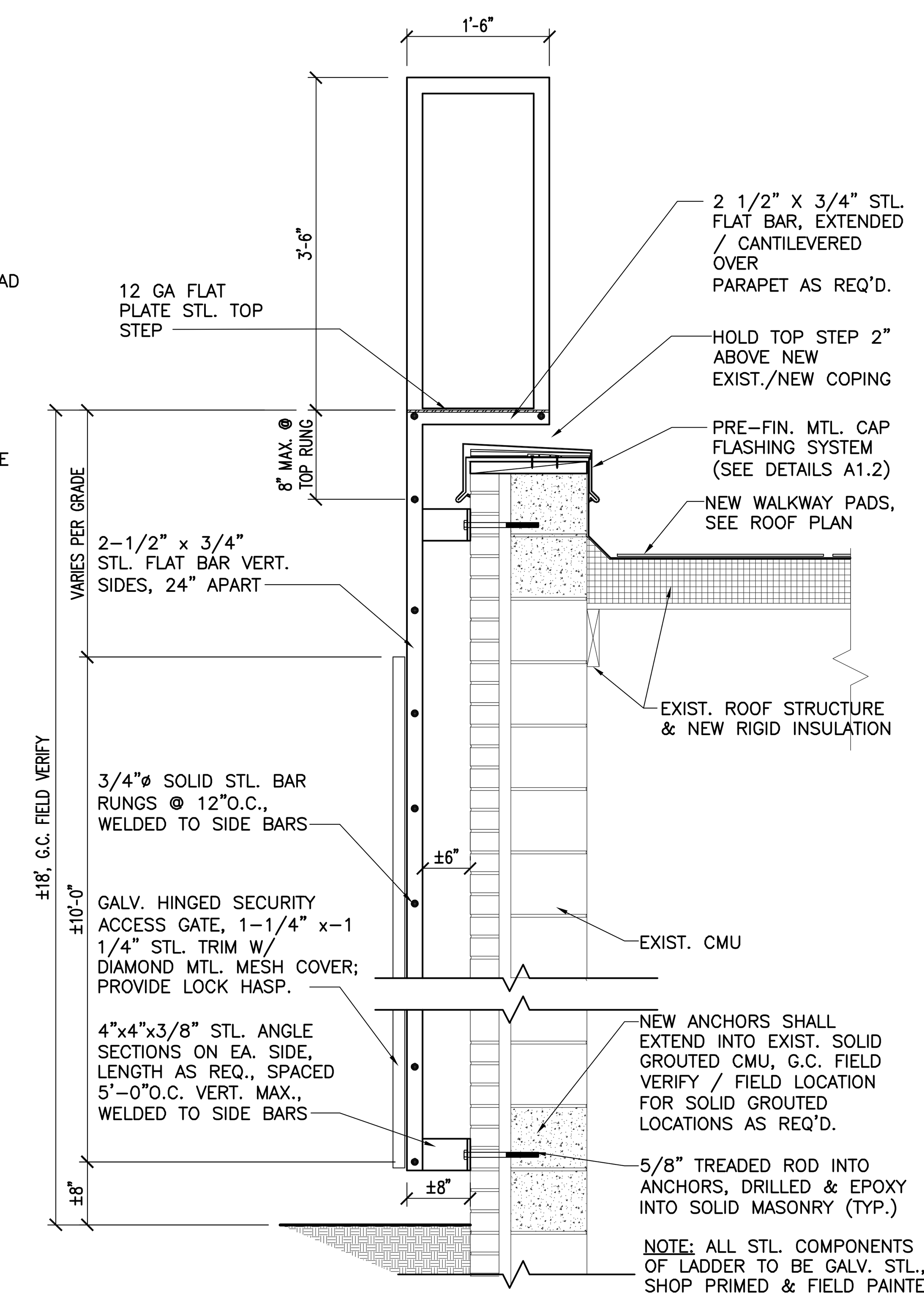
8 A1.2 **EXISTING PARAPET DETAIL W/ NEW COPING (ORIG. BLDG.)**
SCALE: 1-1/2"= 1'-0"



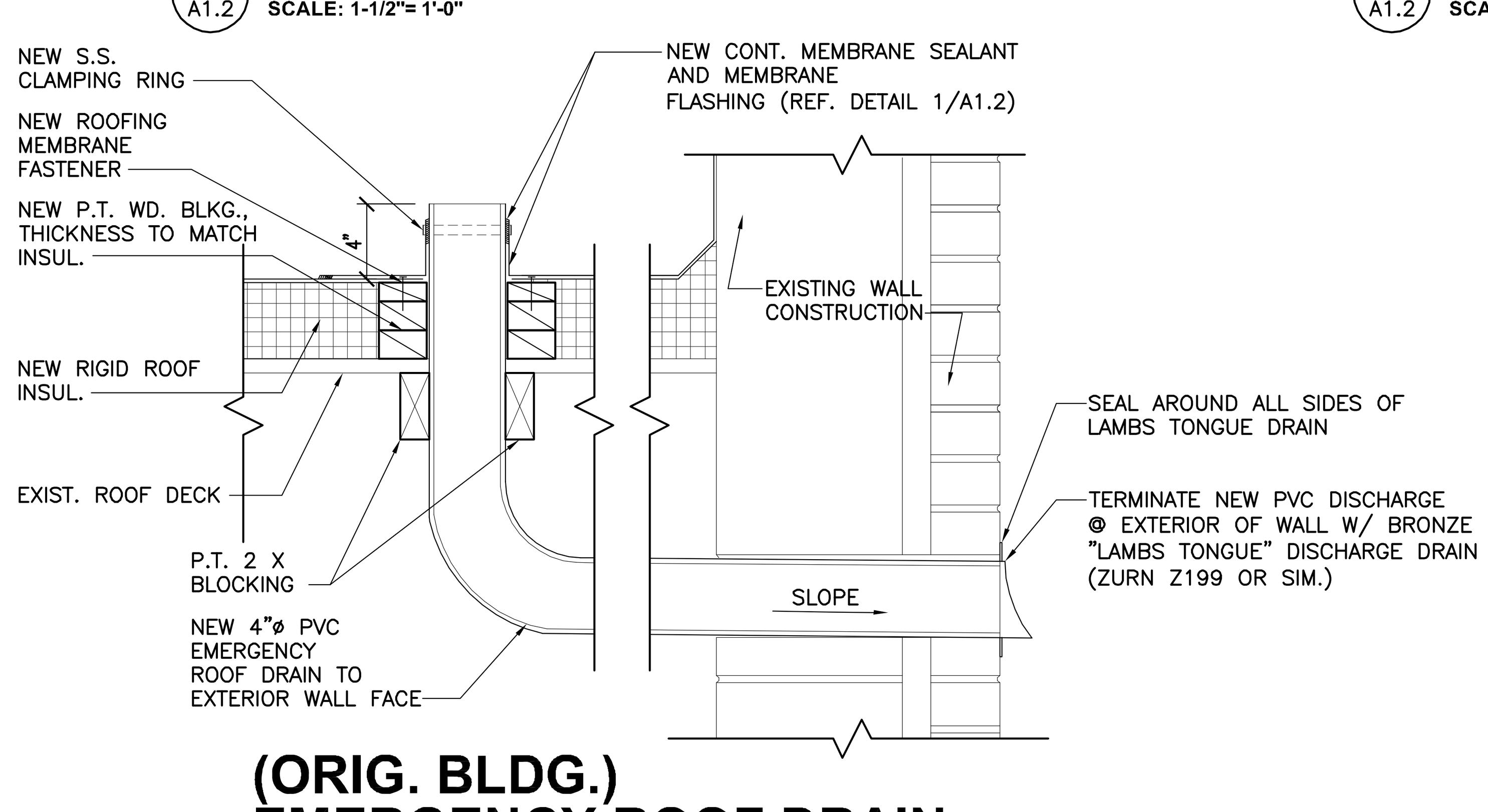
9 A1.2 **FLASHING DETAIL @ EXISTING WINDOWS**
SCALE: 1-1/2"= 1'-0"



10 A1.2 **(ORIG. BLDG.) ROOF DRAIN DETAIL**
SCALE: 1-1/2"= 1'-0"



11 A1.2 **NEW ROOF LADDER**
3/4" = 1'-0"



12 A1.2 **(ORIG. BLDG.) EMERGENCY ROOF DRAIN**
SCALE: 1-1/2"= 1'-0"

NOTE: ALL WORK REQUIRED FOR INSTALLING NEW PRIMARY ROOF DRAINS AND EMERGENCY DRAINS IN ORIGINAL BUILDING (DETAILS 10 AND 12 THIS SHEET) IS INTENDED TO BE CARRIED OUT FROM ABOVE ROOF, NO INTERIOR BUILDING DEMOLITION WILL BE ALLOWED. AS SUCH, CONTRACTOR SHALL INCLUDE WITH BID ANY NECESSARY DECKING REMOVAL AND REPLACEMENT AS REQ. TO INSTALL DRAINS.

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