



CITY OF ALEXANDRIA
HISTORIC PRESERVATION OFFICE
APPLICATION FOR BAR ADMINISTRATIVE
APPROVAL
APRIL 24, 2018

REPAIRS TO THE HISTORIC MAIN HOUSE
619 S LEE ST.
ALEXANDRIA, VA

BAR2018-00198

City of Alexandria
Board of Architectural Review
Staff Review
Address: 619 S LEE
 Not visible from public right-of-way.
 Interior work only. No exterior work authorized.
 Historically appropriate replacement or repair.
Staff: JIR Date: 4/25/18
for Director of Planning & Zoning

SEALER FOR CHIMNEY NOT
APPROVED.

PROJECT NARRATIVE + CONTENTS

619 S LEE STREET | ALEXANDRIA, VA

BOARD OF ARCHITECTURAL REVIEW

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YBL PROJECT
REVIEW FOR CHIMNEY REPAIR

PROJECT BACKGROUND

The Vowell-Snowden-Black House (Virginia Department of Historic Resources Easement File No. 100-0111) is located at 619 South Lee Street in Alexandria, Virginia. Constructed circa 1798-1800, the three-story Federal style dwelling retains much of its historic plan, features, and finishes. The property contains a number of historic and modern additions, as shown on the Site Plan included in this package; these include a historic flounder addition and carriage house, and two modern one-story brick additions. All resources on the L-shaped property are enclosed within a fence, wall and heavy vegetation, obscuring much of the site from public view.

Since 2014, the current owners have been planning a major rehabilitation of the primary residence; the renovation design seeks to preserve the historic structure and allow the owners to live in the original house. In order to accommodate modern needs, the applicant will propose to construct additions to the primary dwelling. The approvals process for this proposed work is projected to begin in the first half of 2018.

Immediately, there is a need to address some deficiencies in the primary structure which are causing damage due to water incursion. This application for Board of Architectural Review Administrative Approval for Roof and Envelope Repairs is submitted to address these issues as soon as possible.

PROJECT NARRATIVE

The main house at 619 S. Lee Street is experiencing water damage which is evidenced at the windows and southwest chimney. The copper gutters are failing, allowing water to wash the exterior walls and enter through various windows. In the case of the fireplace at the first floor of the southwest chimney, water is entering through the masonry wall. The southwest chimney was damaged in the 2009 earthquake, causing visible cracks. Both chimneys on the main house are showing signs of damage at the mortar joints. The slate roof tiles and copper flashings are deteriorated, possibly allowing an additional point of entry for water.

A roof report was performed by Michael Hughes, with Cornerstone Restoration, in 2014 to assess the condition of the slate roof, chimneys, gutters and downspouts and provides recommendations for repair. The report documents the deterioration of the slate, flashing, chimneys, gutters and downspouts. Michael Hughes has re-visited the house several times in 2017 and updated his report which is an appendix to this application. Mark Vaughan, with Vaughan Restoration Masonry, has prepared an assessment of the three historic chimneys on the property and recommendation for rebuilding the two chimneys on the main house. The assessment is an appendix to this application. Mark Vaughan will submit an analysis of the historic mortar and proposed mortar mix before any work commences.

The owners would like to do a comprehensive repair of all rooftop elements at one time, to avoid damaging the repairs by returning to the roof during the full house renovation period. This above-the-roof work comprises the Phase 1 scope. The owner proposes to fully scaffold the main house to access the work area above the roof. In order to avoid a second mobilization of the scaffolding to perform masonry repairs, the owners would like to propose a Phase 2 scope to address all masonry repairs to the main house that require scaffolding to access.

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APPENDIX

- A. 2017 Roof Report
- B. Chimney Assessment
- C. Mortar analysis and proposed mortar mix (to be submitted before commencement of work)

PROPOSED WORK - PHASE 1 & 2

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PROPOSED WORK - PHASE 1 (ABOVE THE ROOF WORK)**Refer also to attached Roof Report and Chimney Assessment**

- a. **Chimneys** - In order to repair earthquake and general damage to the chimneys, this application proposes dismantling the chimneys to the top of the roof and rebuilding them to replicate the original design using the bricks salvaged from the chimneys and new bricks, as needed, to match the existing. It is uncertain what percentage of the original bricks will be acceptable for reuse. New custom-made bricks to match the existing will be sourced from Old Carolina Brick and submitted for approval prior to dismantling the chimneys. Rebuilt chimneys would include a copper-clad concrete cap with pitch pockets for flue penetrations and new or re-used flue caps.
- b. **Slate Roof Tiles, Copper Flashing and Copper Ridge Caps** – The roof report recommends replacing the slate roof and associated flashings entirely. The materials and installation methods are described in drawings and details included in this submission.
- c. **Copper Gutters, Gutter Collectors and Downspouts** – The roof report recommends replacing the copper gutters and downspouts entirely. The materials and installation methods are described in drawings and details included in this submission.
- d. **Brass Snow Guards** – The roof report recommends an improvement on the existing snow guards. The materials and installation methods are described in drawings, details and product cut sheets included in this submission.
- e. **Wood Trim and Windows at Dormers** – In order to install copper flashing at the dormer walls, the existing wood trim will need to be removed. This application proposes removing the wood trim at the dormers and replacing the original pieces after the flashing is installed. At the same time, this application proposes removing the window sashes, restoring the weights and ropes, removing glazing, repairing wood muntins and frames and re-glazing with original glass, repainting and reinstalling the sashes at all dormer windows. Wood dormer sills would be flashed in copper.
- f. **Wood Rake, Window and Eave Trim** – Copper trim has been added at the rake of the roof which is believed to be non-historic (HABS photo in package shows wood rake). This application proposes removing the copper trim and replacing with painted wood trim. The wood trim at the window at the third floor on the north elevation is badly deteriorated and is proposed to be replaced to match the existing details. Any wood substrate or other trim that is found to be in need of repair will be replaced in kind to match existing.

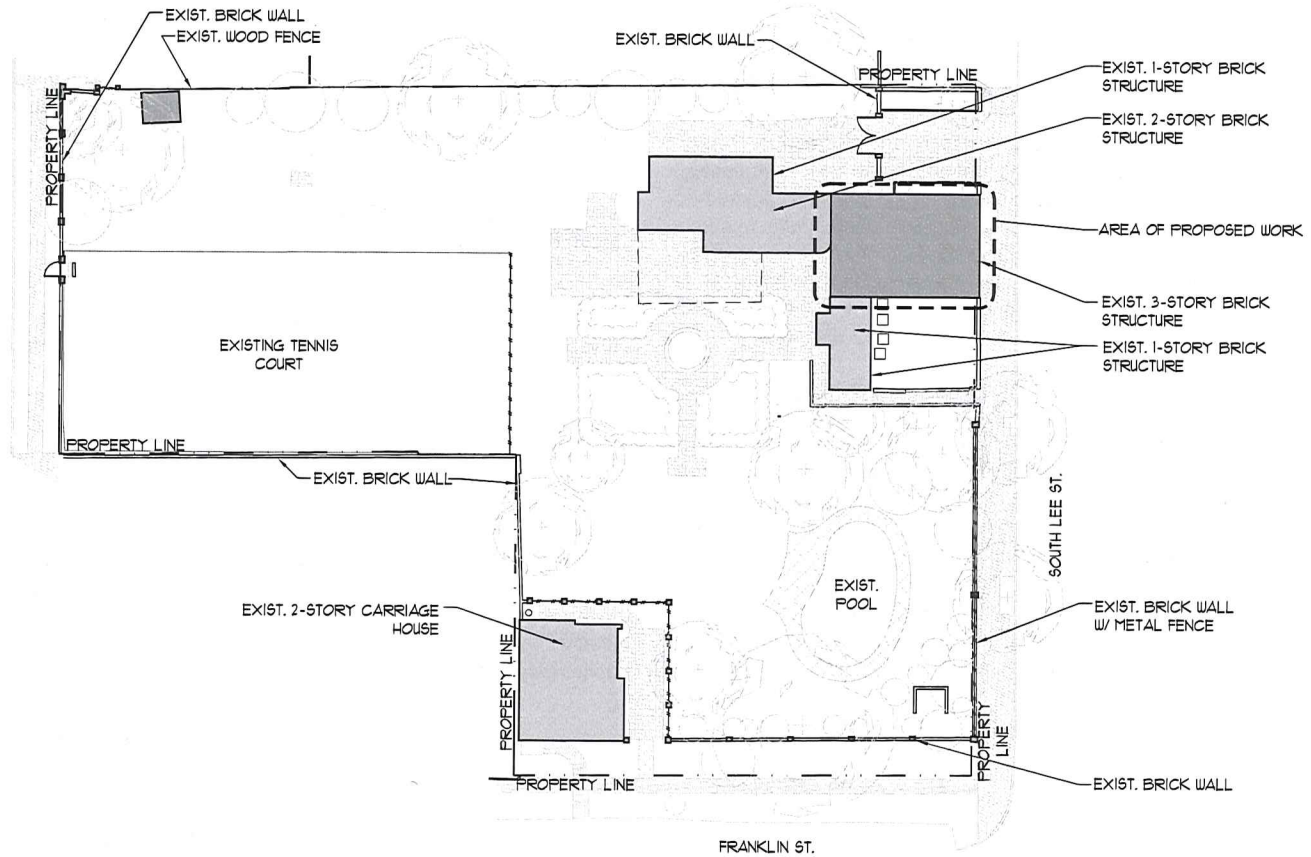
PROPOSED WORK - PHASE 2 (MASONRY WORK REQUIRING SCAFFOLDING)

- g. **Mortar Joints** – The mortar joints on the north, west and south elevations show varying degrees of deterioration and inconsistent repairs over time, this application proposes repointing the non-historic joints on those elevations, as directed by Alexandria Preservation staff in the field. The mortar joints on the east elevation are in good shape and no work is proposed. The selected mason will provide an analysis of the existing historic mortar and propose a lime-based mortar to match the original in color, texture and composition. Proposed joint profiles shall match existing historic profiles. Joints will be pointed as necessary behind existing wood brickmould which will remain in place at the masonry openings. Any damage to the existing brickmould will be repaired and all wood trim will be cleaned, caulked and painted as part of this repair scope. Sashes of windows below the roof will not be restored at this time. Windows can be accessed from inside the house for restoration as part of the overall house restoration / additions.
- h. **Stone Sills and Headers** – This application proposes removing all concrete sills and removing paint from all sills and headers. After paint is removed, stone will be assessed for repair or replacement as confirmed by Alexandria Preservation staff in the field. Existing stone sills and headers (Aquia Creek sandstone) will be repaired in place or removed and replaced with approved stone to match historic profiles, as directed by Alexandria Preservation staff in the field. Mason to provide stone sample for approval prior to removing any material (Pennsylvania sandstone). Mason to provide specifications and application process for stone repair products (Conproco Matrix) for approval prior to commencing with work.
- i. **Masonry Cleaning** – This application proposes cleaning all masonry surfaces on the Main House. The selected mason will advise on cleaning method and products (Sure Klean Light Duty Restoration Cleaner) for approval prior to commencing work.

BAR APPLICATION FOR ADMINISTRATIVE APPROVAL

SITE PLAN

619 S LEE STREET | ALEXANDRIA, VA



KEY
[Shaded Box] EXISTING STRUCTURE
[Dashed Box] AREA OF PROPOSED WORK

CUNNINGHAM | QUILL ARCHITECTS

1 SITE PLAN
SCALE: 1/32" = 1'-0"

ROOF PLAN REPAIRS

619 S LEE STREET | ALEXANDRIA, VA

PHASE 1 REMOVALS KEY:

- ① REMOVE EXISTING SLATE ROOF TILES & COPPER FLASHINGS - REF ROOF REPORT
- ② REMOVE EXISTING SLATE @ DORMER ROOF & WALLS. - REF ROOF REPORT
- ③ DISMANTLE EXIST. CHIMNEY TO TOP OF ROOF. SALVAGE ALL BRICK FOR REUSE - REF ROOF REPORT, CHIMNEY ASSESSMENT & NARRATIVE
- ④ REMOVE EXISTING COPPER GUTTERS - REF ROOF REPORT
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- ⑥ REMOVE EXISTING PIPE FLASHING
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- ⑧ REMOVE WD TRIM AS REQ'D TO INSTALL COPPER FLASHING @ SLATE DORMER WALLS.
- ⑨ REMOVE EXISTING COPPER RAKE TRIM - REF NARRATIVE

PHASE 2 REMOVALS KEY:

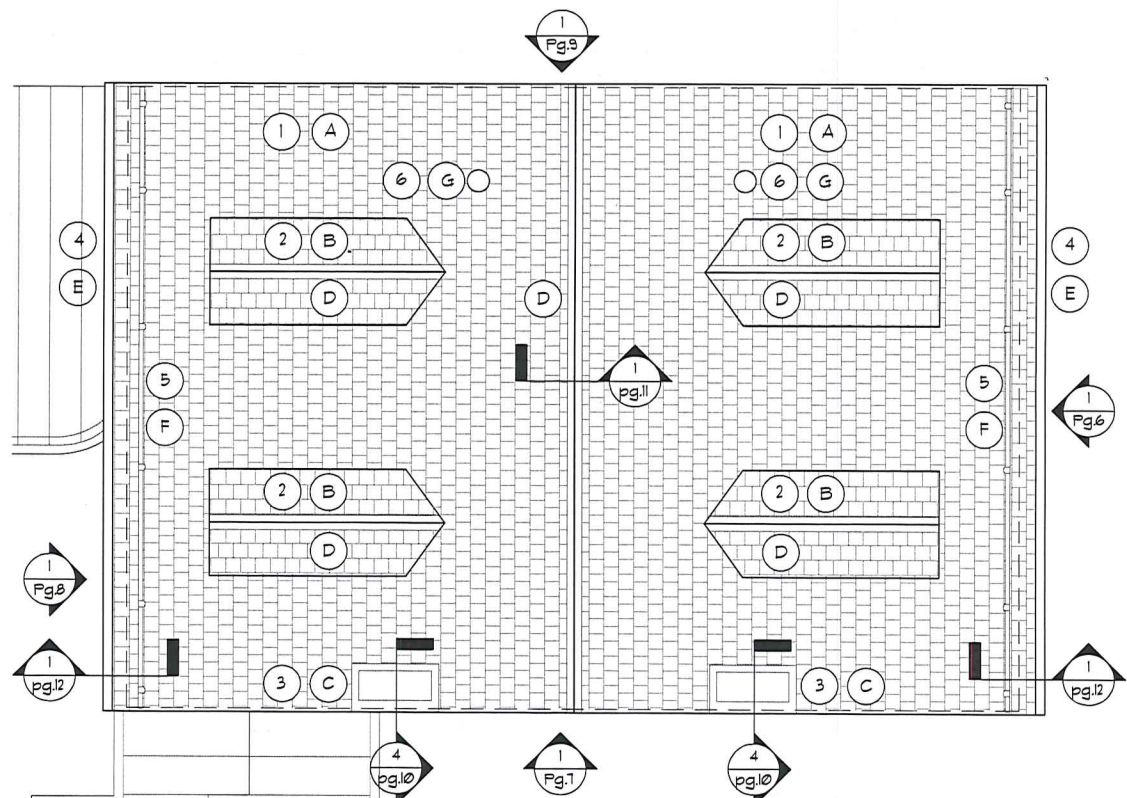
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- ⑪ REMOVE EXISTING SILLS AS ADVISED BY ALEXANDRIA PRESERVATION STAFF IN THE FIELD BASED ON APPROVED METHODS - REF NARRATIVE

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- Ⓚ NEW 5" ROUND COPPER DOWNSPOUT AND BRACKET - REF ROOF REPORT & DETAILS PG. 12
- Ⓛ NEW PAINTED WOOD RAKE TRIM TO REPLACE COPPER - REF PG. 11

PHASE 2 REPAIR KEY:

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- Ⓝ REPAIR / REPLACE EXISTING STONE SILL / HEADER BASED ON APVD MATERIALS & METHODS - REF NARRATIVE



① ROOF PLAN REPAIRS
SCALE: 3/16" = 1'-0"

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EAST ELEVATION REPAIRS

619 S LEE STREET | ALEXANDRIA, VA

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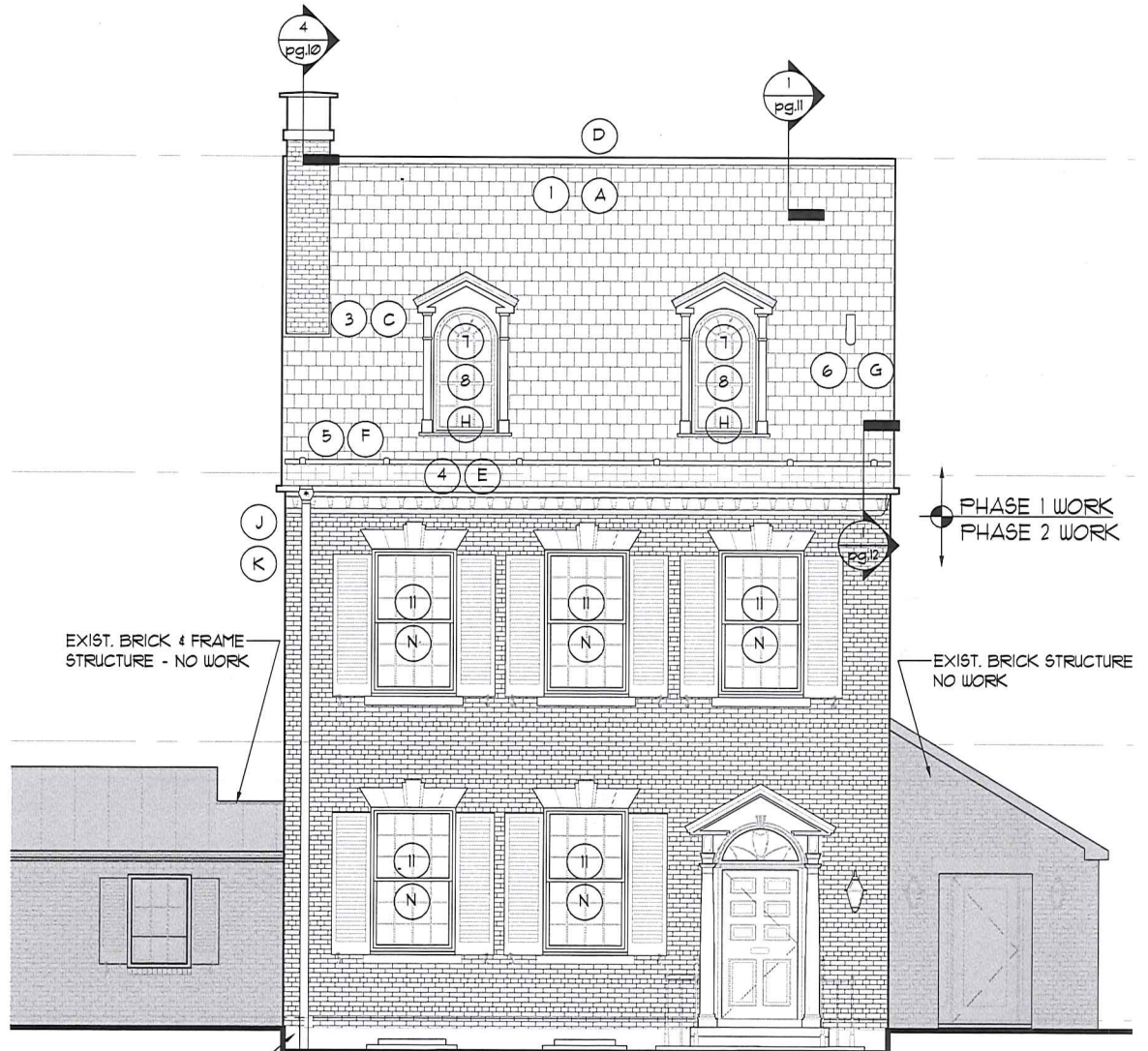
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1 EAST ELEVATION REPAIRS
SCALE: 3/16" = 1'-0"

BAR APPLICATION FOR ADMINISTRATIVE APPROVAL

SOUTH ELEVATION REPAIRS

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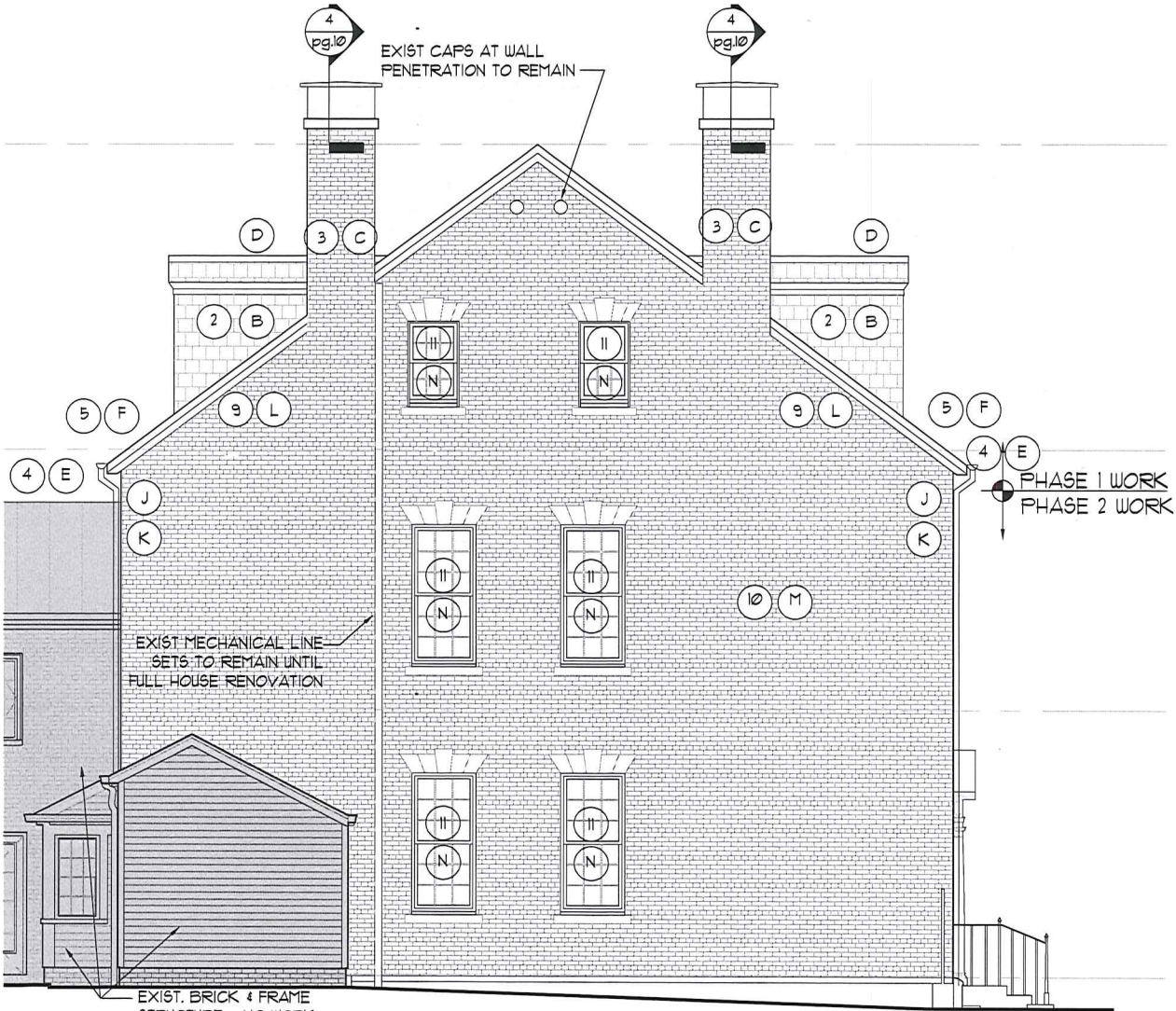
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① SOUTH ELEVATION REPAIRS
SCALE: 3/16" = 1'-0"

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WEST ELEVATION REPAIRS

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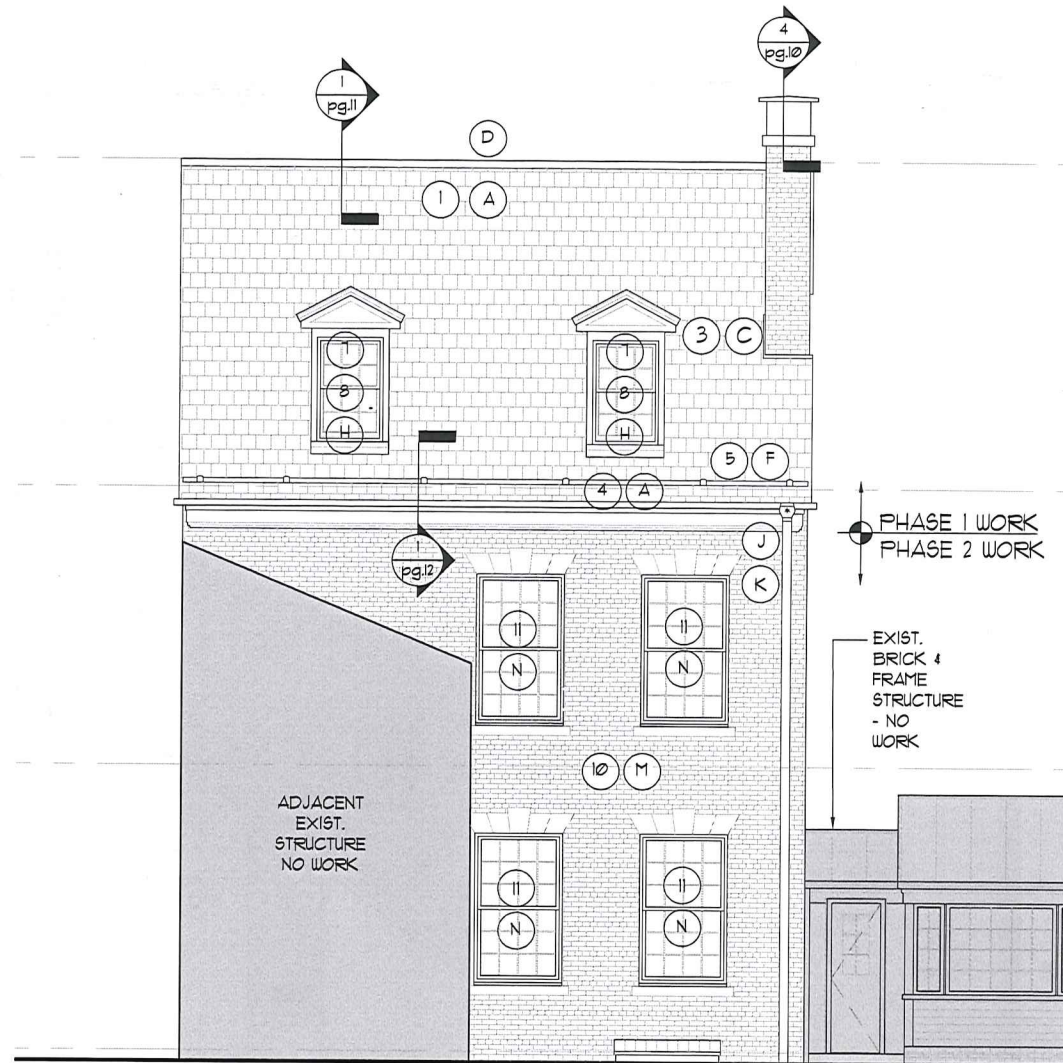
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1 WEST ELEVATION REPAIRS
SCALE: 3/16" = 1'-0"

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NORTH ELEVATION REPAIRS

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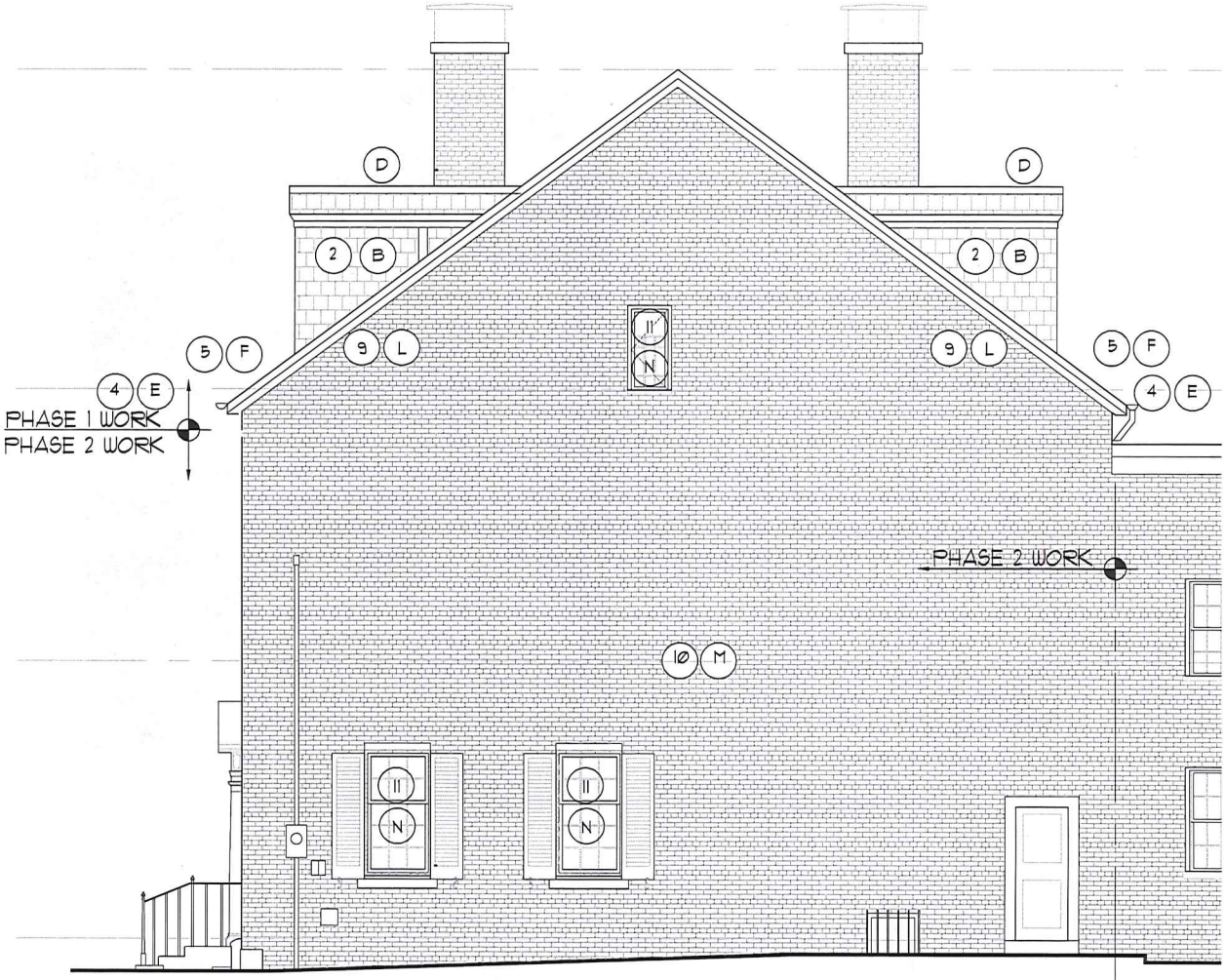
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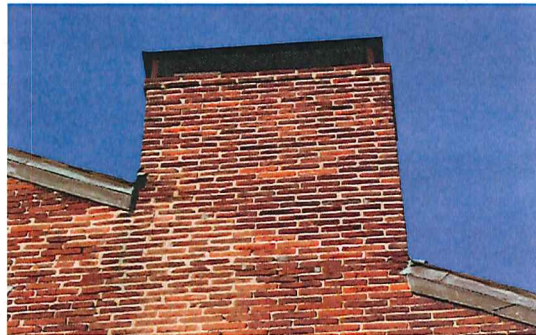


1 NORTH ELEVATION REPAIRS
SCALE: 3/16" = 1'-0"

DETAILS & PHOTOGRAPHS - CHIMNEYS
619 S LEE STREET | ALEXANDRIA, VA



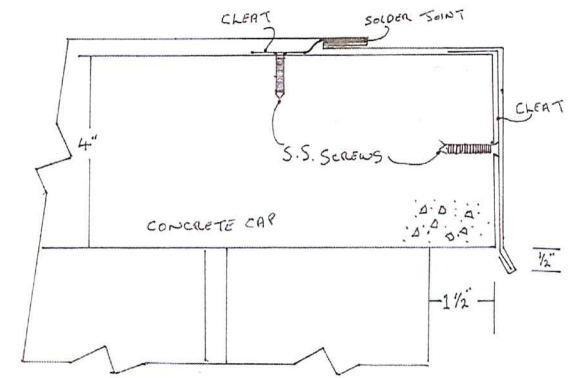
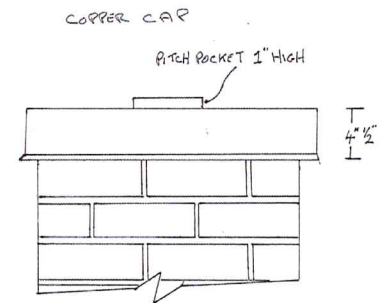
1 **DETAIL @ TOP OF WEST CHIMNEY**
NOT TO SCALE



2 **DETAIL @ TOP OF EAST CHIMNEY**
NOT TO SCALE



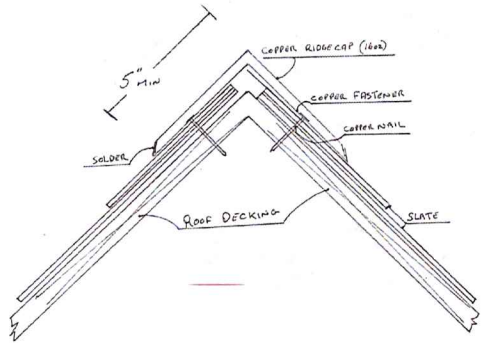
3 **HISTORIC PHOTO AT LEE ST. ELEVATION (1937)**
NOT TO SCALE



4 **CHIMNEY CAP DETAIL**
NOT TO SCALE

BAR APPLICATION FOR ADMINISTRATIVE APPROVAL

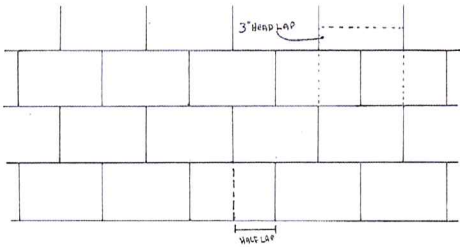
DETAILS & PHOTOGRAPHS - SLATE ROOF TILES, COPPER FLASHING, DORMERS AND RAKE TRIM
 619 S LEE STREET | ALEXANDRIA, VA



COPPER RIDGE CAP

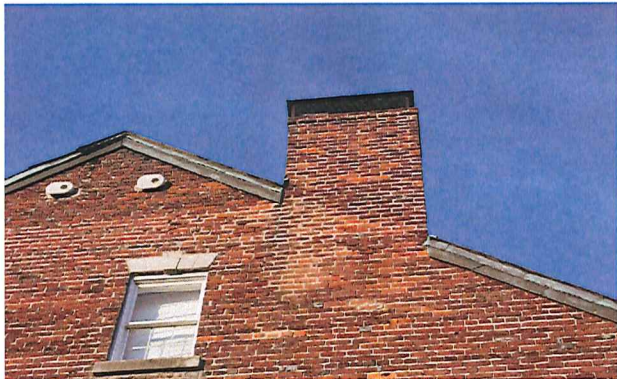
* COPPER FASTENER:
 1 3/4" STAP OF 20oz COLD ROLLED COPPER
 FLANG IN HALF LENGTH WISE.
 FASTENER TO BE NAILED TO THE DECK
 AND SOLDERED (S/S/S/SOLDER) TO CAP.

1 COPPER RIDGE CAP DETAIL
 NOT TO SCALE

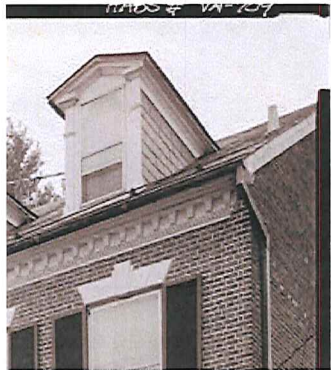


STANDARD AMERICAN HALF LAP BOND
 SLATE SIZE 12" X 11" X STANDARD THICKNESS (1/4" - 3/8")
 3" HEAD LAP
 ROOF SLATE PATTERN

2 SLATE INSTALL DETAIL
 NOT TO SCALE



3 NON-HISTORIC COPPER RAKE TRIM
 (TO BE REMOVED)



5 HISTORIC WOOD RAKE TRIM
 NOT TO SCALE



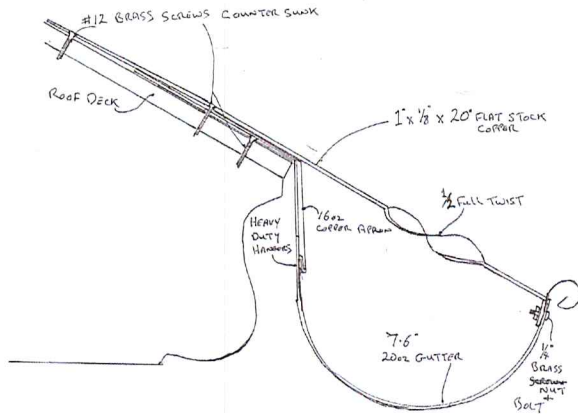
4 CANADIAN BLACK SLATE SAMPLE
 (PROPOSED REPLACEMENT MATERIAL)



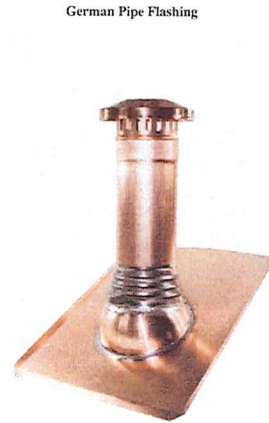
6 LEE ST. ELEVATION-EXISTING CONDITIONS
 NOT TO SCALE

BAR APPLICATION FOR ADMINISTRATIVE APPROVAL

DETAILS & PHOTOGRAPHS - COPPER GUTTERS AND DOWNSPOUTS, PIPE SLEEVES, & SNOW GUARDS
 619 S LEE STREET | ALEXANDRIA, VA



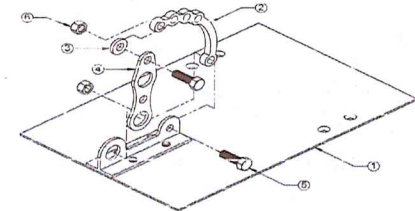
1 GUTTER INSTALLATION DETAIL
 NOT TO SCALE



3 COPPER PIPE SLEEVE
 NOT TO SCALE

Assembly Sheet - PP502 Brass/Brass (8"x16" or Larger)

1. Installation to be completed in accordance with manufacturer's written specifications and installation instructions.
2. See line items or contact manufacturer for detailed material, finish, and configuration options.
3. Contact manufacturer for detailed layout.
4. 1/8" PS Scale, Clearing.
5. Subject to change without notice.



ITEM NO.	PART CODE	DESCRIPTION	QTY
1	BASE BR-500	Base Brass 8x16-500 or Larger	1
2	PP225 CONNECTOR-BR	PP225 Connector Cast Brass	1
3	SPACER BR-187W-IN	Brass 3/16" Spacer	1
4	UPRY-PP502-R2-BR	Brass 502 Upright for Uprist	1
5	B-HX BR-5-13	Brass Hex Bolt 5-13x1.75	2
6	N-HX BR-5-13	Brass Hex Nut 5-13	2

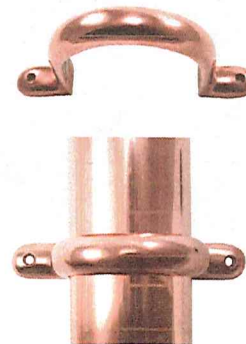
ALPINE SNOWGUARDS EcoFasten Solar
 1110 Vermont Street, Montpelier, VT 05601
 Toll Free Phone: 1-888-765-4273 Toll Free Phone: 1-877-850-2547 Material: See Space Sheet
 Toll Free Fax: 1-800-795-0556 Toll Free Fax: 1-800-526-0548 Quote: 1.3 4/25/2016 ASG: X EPS: -

5 CUT SHEET SNOW GUARD
 NOT TO SCALE

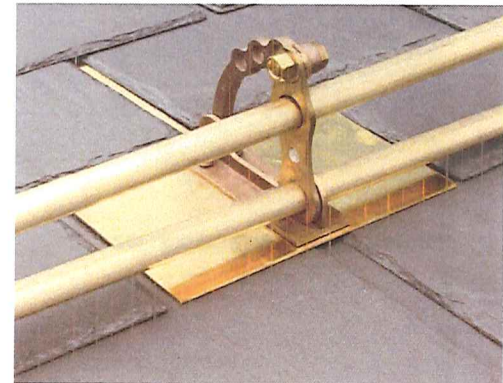


2 MOCK UP OF PROPOSED GUTTER/DOWNSPOUT ASSEMBLY
 NOT TO SCALE

MODERNE STYLE DOWNSPOUT BRACKET



4 DOWNSPOUT BRACKET
 NOT TO SCALE



6 BRASS SNOW GUARD
 NOT TO SCALE

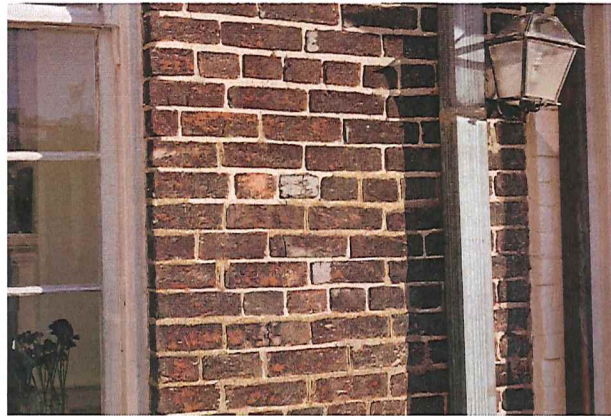
BAR APPLICATION FOR ADMINISTRATIVE APPROVAL

PHOTOGRAPHS - SAMPLE MORTAR JOINTS

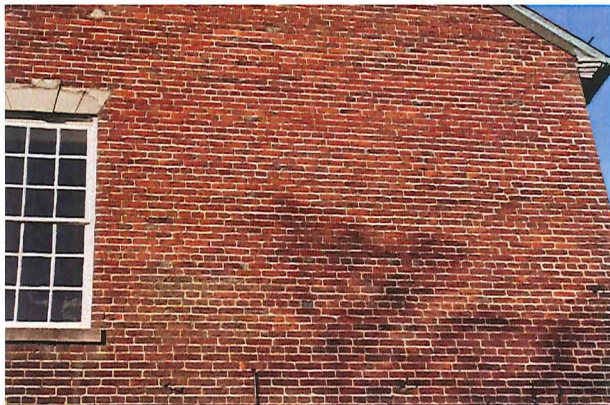
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1 EAST ELEVATION (S. LEE ST) - NO WORK PROPOSED
NOT TO SCALE



3 WEST ELEVATION - REPOINT JOINTS
NOT TO SCALE



2 SOUTH ELEVATION - REPOINT JOINTS
NOT TO SCALE



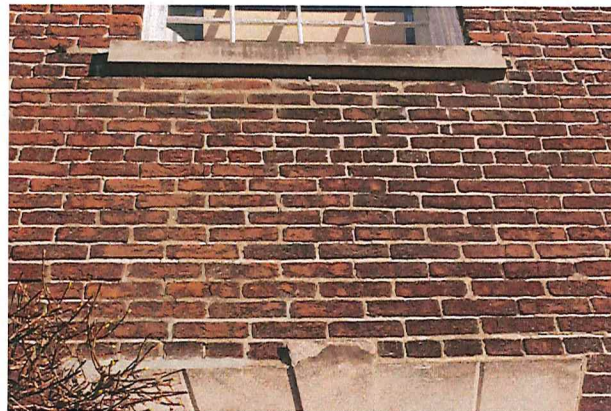
4 NORTH ELEVATION - REPOINT JOINTS
NOT TO SCALE

PHOTOGRAPHS - SAMPLE STONE SILLS & KEYSTONES

619 S LEE STREET | ALEXANDRIA, VA



1 CONCRETE SILL - REPLACE
NOT TO SCALE



3 DAMAGED HEADER - REPAIR OR REPLACE
NOT TO SCALE



2 DAMAGED STONE SILL - REPAIR OR REPLACE
NOT TO SCALE



4 PAINTED SILL - REMOVE PAINT, ASSESS NEEDS
NOT TO SCALE

Vowell-Snowden-Black House
619 S. Lee Street
Alexandria, Virginia

January, 10th, 2018

BOARD OF ARCHITECTURAL REVIEW

Photographs
&
A written report on the condition of the slate roof and metal roofs

Report written by Mr. Michael J Hughes
Cornerstone Restoration Inc
PO Box 4729 New Windsor NY 12553
www.cornerstonerestorationinc.com

The Slate Roof.

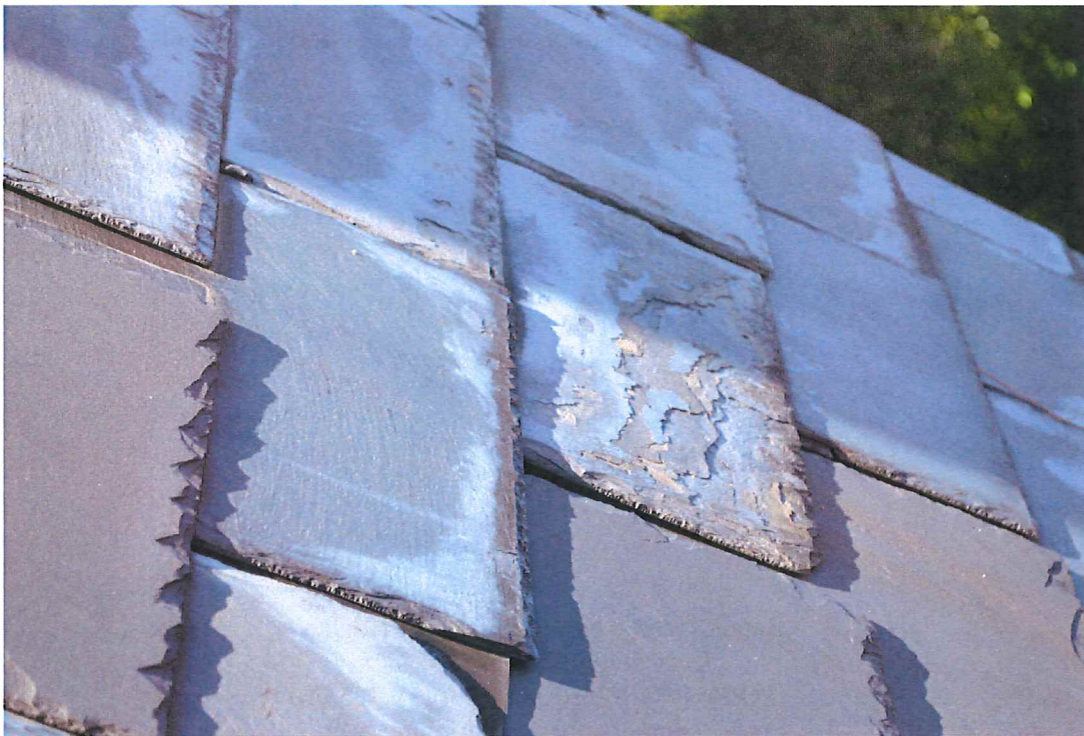
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The slate presently installed on the Vowell-Snowden-Black House are known as "Pennsylvania Black". This is for the most part a soft slate, with a life expectancy of 50 to 75 years. Some have argued that that number is more like 75 to 100 years but it truly depends upon the softness/hardness of each batch of slate.

"Pennsylvania Black Bed" quarried slates were high in carbonaceous impurities and were recommended by the Slate Association only for temporary buildings, or for chalkboards. By the 1920's this slate was recognized as not as durable."

"Pennsylvania Black slate shows a mottled appearance with white faded patches resulting from exposure to sunlight and moisture. The white areas generally begin at the three exposed sides, growing towards the center of the slate as a function of this time and exposure. The white visible in, Pennsylvania Black slate is a sign of efflorescence – lime deposited on the slate surface. These signs along with, slate rot, are a sign that the roof is at its end."

Slate Roofs, National Slate Association, p.71-76



619 S. Lee Street House Roof image 1.

Delamination or Slate Rot

“Delamination is caused by the reaction of certain minerals to long-term moisture cycles. Over time, these minerals expand, causing layers to separate along cleavage planes. Because slates are most likely to absorb moisture along their edges, that’s where delamination is often most obvious. As slate ages, paper-thin flakes separate from its surface, and its interior becomes increasingly soft and spongy as the inner layers also begin to delaminate”.

“As layers delaminate, they provide an avenue for moisture to be absorbed into the tile’s interior. “Rot” is the term most commonly used to describe this delamination. The softening, crumbling effects of slate deteriorated by moisture are similar to wood rot.”

Mastering Roof Inspections: Slate Roofs, Part 4

The delamination of the slate also occurs on the underside of the slate as is evident on the removed slate sample I examined. Therefore, the visible damage is not the only damage occurring to the slate at this time.



619 S. Lee Street image 2.

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619 S. Lee Street Image 3 & 4.

Along with the, Slate Rot, I found numerous areas where the roofing nails have “pushed” their way thru the slate above to expose the nail head and in doing so are providing water access to the roof deck below. In addition this roof has also been the recipient of multiple poorly executed repairs over the years.



619 S. Lee Street image 5.

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Here we see an example of poor quality repair work and yet another nail head push thru. The repair tiles are, Vermont Black held in place with copper strips and calk. Also the area around the newer tiles has been calked rather than replacing the broken/split slate.



619 S. Lee Street image 6.

Copper Flashings

The dormer flashings and copper valleys have been worn thin and are now showing signs of water penetration on the inside of the house. The valleys at the top of the dormers were repaired some time ago with Tar. In addition the dormer ridges have been tarred and the last row of slate has exposed nails all along its length.



619 S. Lee Street images 7 & 8.

The flashing around the main roof chimneys has been tarred and calked in an attempt to prevent leaks. The street side chimney has been sealed from the inside around roof level with expanding foam. The foam is clearly visible where it has worked its way out from under the chimney flashing and even from under the slate.



619 S. Lee Street image 9.

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Snow Guards

The Snow Guards consist of cast iron S&S of Slatington Pa., snowbirds and what appears to be electrical steel pipe conduit. The pipe has been left to simply lay on the slate roof while the top rail is wired to the top of the snowbird. The fact that one rail is laying free on the roof and the second is held in place with a piece of rusty wire makes it truly a safety issue as well as being not functional. Also the S&S snowbird nailing straps are quite worn due to rust.



619 S. Lee Street image 10.

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Copper Gutters

The copper half round gutters are, like the snow guards, being held together with wire. They have sustained significant damage over the years and also have holes worn thru them as shown below.



619 S. Lee Street images 11 & 12.

Conclusion

Having inspected the roof on June 24th 2014, I found enough strong and compelling evidence to conclude that in order to preserve the integrity of the building itself this roof must be replaced. In the HABS (*Historic American Buildings Survey*) VA – 709 report there are two photographs from 1936, which show the front and rear of the house. The backside of the main roof is shown with a trap door in it and significant staining to the slate themselves. The front side photograph also shows staining and damage to the slate. Later photographs show a new roof, no stains, with no broken slate. Given the dates of the photographs and the physical evidence of the condition of the existing slate roof it is my opinion that this present roof was installed around 1940+. That means the roof is approximately 74 years old and given the life expectancy of the, Pennsylvania Black slate of 50 to 75 years they have served their purpose.

Recommendations

Replacement Slate:

When the house was built in 1798 -1800 it would most likely have had a slate roof utilizing slate from, Wales. Slate quarrying in the US was not established until the mid 1800s long after the house was built. When ships sailed from Great Britain to the “New World” to pick up raw merchandise they were often times empty. The captains who would sail into the deep-water harbors of Baltimore, Charleston and New Orleans would use Welsh slate in the hold of their ships for ballast. Upon arrival, the slate would be off loaded and sold by the agents at the port. The Welsh slate come from the same vein as the Pennsylvania Black with one significant difference. The Welsh slate were placed under tremendous pressure and heat resulting in a very hard stone. The Pennsylvania slate did not go thru the same geological process and as a result are a softer tile, with a significantly shorter life expectancy. The question then becomes what to use to replace this roof. Having consulted with JoAnne Baker, of Camara Slate Products, Inc.; 963 S Main St, Fair Haven, VT 05743 (802) 265-3200 we recommend replacing the roof slate with:

Canada Black Slate, also called North Country Black, 18” x 11” x ¼” or Spanish Black 18” x 11” x ¼” Slate to be secured with inch and a half copper slating nails. The slate pattern to match the existing pattern which is, Standard American Half Lap with a minimum 3” head lap.

Both these tiles are true to the Welsh slate in hardness and colour . They also come from the same geologic rock formations as the Welsh slate.

Flashing replacement:

The copper flashing should be replaced with 20oz red cold rolled copper for the valleys and step flashings, with 16oz red cold rolled copper for the counter flashings.

Gutter replacement:

I recommend the use of "World Gutter System" half round copper gutters from The Slate and Copper Sales Company; 436 West 12th Street. Erie, PA 16501
Tel: (814) 455-7430 Fax: (814) 464-8838 www.slateandcoppersales.com
The gutters should be 8" (actual size is 7.5") half round in 20oz red copper with heavy-duty roof mount hangers with attached copper strap. Hangers and straps to be attached to the roof with countersunk inch and a half #12 brass screws. The gutters will have "Star Drop Outlets, with no logo and secured as per manufactures specifications. The gutter shall have a continuous 16oz red copper apron crimped to the back of the half-round gutter and extended up the roof at least five inches. The apron shall be secured with the use of industry standard copper cleats and all seams are to be tinned, riveted and soldered. The downspouts should be 4" plain round in 18oz., with World Gutter systems "heavy-duty pipe" at grade. Downspouts to be secured with "Moderne style brackets" in red copper with stainless steel fasteners. All copper seams are to be, tinned riveted and soldered with copper rivets and 50/50 lead/tin solder.

Snow Guard replacement:

I recommend replacing the existing snow guards with, PP502 all brass two pipe snow guards. These are available from, Alpine Snow Guards, 289 Harrel St, Morrisville, VT 05661, Tel: 888-766-4273. Guards to be installed as per manufactures recommendations.

Ridge Cap:

The existing ridge cap is made of slate, many of which are face nailed. Slate ridge caps are notorious for failing due to high winds and storm damage. They also do not have the longevity of a properly secured copper ridge cap. Therefore, I recommend replacing this type of cap with a 16oz copper ridge cap with concealed fasteners.

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Chimney:

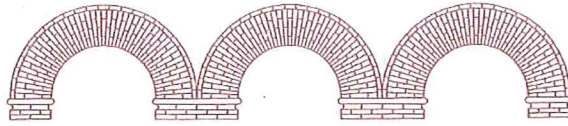
The chimneys should be removed down to the roof line and rebuilt. Proper thru flashings should be installed. The thru flashing and counter flashing should be of 16oz red cold rolled copper with 20oz step flashing. The flue liner should also be replaced. The cap should be poured concrete wrapped entirely in copper with pitch pockets around the flues. The HI-Hat cover should be reused if possible or replaced with a similar cover. ~~The brick should then be treated with a breathable sealer such as, "Klear Treat Water Repellant" from Chargar Corporation; 299 Welton Street; Hamden, CT 06517 Tel: (203) 562-9948~~

SEALER REQUIRES BAR
APPROVAL AT A PUBLIC
HEARING.

BOARD OF ARCHITECTURAL REVIEW

This report has been revised from July 4th 2014

By
Michael Hughes



VAUGHAN RESTORATION MASONRY, INC.

3917 WHEELER AVENUE
ALEXANDRIA, VIRGINIA 22304
703-823-5944 • Fax 703-823-5946

619 South Lee Street
Alexandria, Virginia 22314

March 29, 2018

To whom it may concern:

The existing condition of the two chimneys on the South elevation.

The East chimney, from the gable, has a slight lean towards the roof of the house, along with a twist from front to back. There are several spalled bricks and orange bricks throughout all sides of the chimney. The difference in the color and texture of the bricks, suggest the chimney May have been rebuilt in sections or from the roof line to finished height. There has been different areas of repairs or repointing which is seen by the different mortars used. The area below the roof line has areas of spalled bricks and possible caused by repairs. The existing mortar used for the repairs and repointing looks to be a Portland based mortar and is likely the cause of the spalling of the bricks.

The West chimney, from the gable, has similar conditions of the East. The lean towards the roof appears to be more. There is a step crack in the brick work of the chimney and appears to have moved, at the step crack. There are some spalled bricks in the chimney but look to be isolated brick replacement. The existing brick's color range appears to have less orange bricks which could suggest less repairs to the chimney. The south face of the chimney has a higher percentage of eroded mortar joints, which suggest some of the joints could still be original.

It is important to understand that the areas where modern mortar was used to rebuild or to do selective repairs and repoint, will limit the ability to salvage the original bricks to be reused. Salvaged bricks to match can be difficult to acquire.

To ensure the two chimney are sound and functional, for an extended period of time, dismantling and reusing the original bricks and the proper lime based mortar used for the rebuilding of the chimney is recommended.

Sincerely,

Mark S Vaughan

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