Durant-Kenrick House

Newton, MA

Exterior Paint Study

April 2012

BCA

BUILDING CONSERVATION ASSOCIATES INC

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Prepared For
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Jackson Homestead and Museum
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April 2012

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DURANT – KENRICK HOUSE
NEWTON, MASSACHUSETTS

EXTERIOR PAINT STUDY

Brian Powell, Architectural Conservator
Building Conservation Associates
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Description of Project

In the spring of 2012 the Newton Historical Society asked BCA to study the exterior paints of the Durant – Kenrick House, their museum at 286 Waverly Avenue in Newton which is presently being refurbished, and to re-create an early treatment of their choice.

The project was co-ordinated by Cindy Stone, the Director of the NHS, who provided historical information, oriented us at the house, arranged for our logistical needs, and, in conversation with BCA and NHS members, determined the target treatment.

We are extremely grateful to Anne Grady who has studied the house and completed a Historic Structure Report on it. Anne generously provided copies of her report and other useful documentation, and met us at the house where she outlined her findings in person.

We also offer thanks to Dave Desalvo of the M.J. Mawn Company of Walpole, Massachusetts, the project contractor. Dave ascended a tall ladder in many spots and cut out samples for us. Grasping our needs quickly, he was both careful and pleasant to work with.

After preliminary analysis to get an overview of the building's paint history, the Society chose an early scheme with verdigris green clapboards and tan trim. This treatment dates to a period when the house had already been expanded to the rear in its present saltbox form, but before the addition of the present Greek Revival south door and architrave, likely some time in the early nineteenth century during the Kenrick period.

In addition to matching a selected scheme, the project also hoped that paint evidence would answer some questions on the house's early history.

Discussion

<u>Methods of Working</u>

After looking at the available documentation, reading Anne Grady's HSR, and being oriented on site by both Cindy and Anne, we did several perimeter walks looking, often through binoculars, for what appeared to be good spots for study. We then did in-situ microscopy of elements reachable from the ground, inspecting paint accretions through small scalpel cuts with a 20x binocular field microscope to begin to gauge the quality of the evidence and the paint histories of representative elements.

We then (with the help of Dave Desalvo) cut out samples of paint on wood substrate with an electric cutting tool. We cast part of each sample in polyester resin (Extec Polyester Resin and Hardener, Extec Co., Enfield, CT) and ground and polished them perpendicular to the paint layers to form cross sections. These we studied and photographed at high magnifications on a Nikon Eclipse 80i microscope in both visible and ultraviolet light. (In the UV, some paint components glow or "autofluoresce" in characteristic colors and intensities allowing the tracing of particular layers from sample to sample in a way not always possible in visible light.) We studied the cross section photographs and cut into the uncast parts of the samples to get an understanding of the building's general paint history. After the interpretive period was established we exposed areas of its paints mechanically by blade under binocular magnification. We then light bleached and color matched the paints as described below in the Color Matches section.

Quality of the Evidence

On initial inspection the Durant – Kenrick House does not appear to preserve much early paint. Indeed, much has been lost to weathering, prep for past re-paintings, and replacement of material, especially clapboards. For this reason we sampled very redundantly, taking fifty-five painted plugs from spots that seemed by eye to have thick accretions.

Our thorough sampling paid off, in that the greater number of our cross sections show quite thick accretions. This gave us ample evidence to parse paint histories on trim, clapboards, and doors dating back to the late eighteenth and early nineteenth centuries. The evidence did not, however, allow confident description of the building's very earliest coatings history. The single element whose sequences were consistently shallow was the sash whose early color history seems to have been largely erased.

History of the House

In her study of the house Anne Grady noted two dating issues that might be illuminated by comparative paint layering analysis, the date of the present front door architrave and the time of the lean-to rear expansion. We quote from her e-mail of October 29, 2010:

> " … the west doorway seems later than 1734, so comparing paint layerings on the doorway with the window and other trim would let us know if the doorway was later … "
>
> "There seems to be a barely visible line on the south façade where clapboards were added when the lean-to roof was raised."

While the scope did not allow a full comparative dating study, we are able to comment on these two issues.

We were able to find very good evidence for paint schemes dating comfortably back into the eighteenth century. However, the earliest paints had chalked and alligatored very badly, blurring their layering and preventing confident analysis of the earliest treatments. However, it was clear in many cross sections that the surviving early paints on the façade door architrave matched those on trim samples from the front room window frames and cornice. (See photographs #1 and #2 of cross sections #15 and #5.) So, paints tell us that the present architrave has been in place for most of the history of the house, but cannot tell if it is original or was added at an early date. It is possible that interior paint research would give an answer.

We took samples from both sides of the south wall clapboard joint line that might be a memory of the pre-lean-to rear roof in places that seemed to preserve thick layerings. Our sample in the assumed area of the original house was disappointing, but other samples from the front showed good clapboard paint layering with which to make a comparison. (See photograph #3 of cross section #41.) Sample #48 taken on the lean-to side of the line shows virtually the same sequence. (See photograph #4.) So, while the paints show very clearly that the lean-to is early, they do not confirm that the apparent former roof line is indeed that.

The early facade cornice paints showed a very unexpected variation, and one whose significance is unclear. On the soffit samples, but on no others either from the cornice or elsewhere on the house, the sequence begins with a dark red followed by a light purplish pink. (See photograph #5 of cross section #26. The early dark red is clearest in the ultraviolet view.) While this gives a foothold to postulate either that the soffit boards date to an earlier form of the façade or that they were re-used from elsewhere, it proves neither. Unfortunately, both of the soffit samples were taken toward the south. If additional samples were taken from the north end the presence or absence of these layers would allow further speculation.

<u>Choice and Description of Interpretive Period Treatment</u>

To get a handle on the house's early paint treatments that would assist the NHS in its choice of an interpretive period, we focused on the south door and its architrave, dated by Anne Grady to the 1830s. This gave a very useful known point in time.

The south architrave sidelight reveals preserve excellent evidence of their full paint histories. (See photograph #6 of cross section #6.) The sequence is thick, but not so thick as those on many front (west) area samples. Comparing the sidelight frame to the deepest trim samples we found, the deeper sequences show what initially appear to be four or five earlier treatments. (Compare to photograph #6 to photograph #1 of cross section #15.) Even in times when exterior painting was done less frequently than now, that number of treatments seems scant to account for a full hundred years back to the building's 1734 construction date. This re-enforces the impression gotten from comparison of the façade door architrave to other early trim samples that the house's very earliest paint history cannot be confidently re-constructed. But it also tells us that the paints we do have almost certainly extend well back into the eighteenth century.

The original south door architrave paint treatment was a light color, possibly a period "stone" color if isolated and matched. To determine what clapboard paint accompanied it we compared the sidelight cross sections to the fullest clapboard sequence. In visible light it appeared that there had been a number of monochrome treatments (i.e., trim and clapboards done in the same color) from the time of the door's installation through several subsequent paintings. Comparing the sequences in ultraviolet light, we saw that the second treatment on the architrave autofluoresced (glowed) in an intense blue-white. Seeing a treatment in the clapboard series that appeared to match it in both visible and ultraviolet light, we uncovered a small area of the paint immediately preceding it and measured its color. We also measured the original architrave color. (This was done without light bleaching either sample as it was simply for comparison.) The colors matched. So, it appears that the 1830s treatment was indeed a monochrome. More importantly for the study, we knew its exact location in the clapboard series.

Immediately preceding the 1830s clapboard paint was a very dark clapboard treatment which itself had been preceded by another darkish treatment. Cutting into the upper dark treatment under binocular magnification it was clear that it had been a dark green that was extremely degraded. We could see a number of resinous-looking green chunks that we recognized as verdigris, a synthetic copper resinate that was the bright green of choice for architectural use in the eighteenth century. This paint would have been a quite vivid darkish green, and an extremely unusual choice for use on clapboards. Having found out this much we e-mailed and spoke with Cindy to see what treatment the NHS would like to have re-constructed.

Some in preservation would argue that the installation of a major element – here the south doorway - re-set the decorative clock on the building, and that it would be curatorially impossible to use a treatment that preceded that time. However, anachronisms are extremely common in house museums, and many argue that they are permissible as long as they are explained to visitors.

The NHS's main use of the house is to educate on early local history. The 1830s post-dates their period of emphasis. It also barely appears in the interior finishes of the front rooms, most of whose trim dates to the eighteenth century and whose last major upgrades date to the Federal period.

In addition to this, the green-clapboard scheme is extremely unusual. Verdigris was very fugitive. Paints mixed with it discolored over time from high chroma (bright) greens to dull greenish browns. And it was expensive. Therefore it was rarely used on exterior elements where its decay might be accelerated, even on the green shutters that became popular in the early nineteenth century. The minute more color-fast greens were available the market abandoned verdigris.

In all of our many years of paint study this office has never before found a deep verdigris on clapboards, so to us it is quite noteworthy. And, especially in a time when museum houses often suffer little notice and low visitation, re-creation of the green clapboard scheme might help to generate interest in the building. For these reasons the NHP chose the green-clapboard scheme.

To complete the scheme we needed to isolate the accompanying trim and door colors. (We found no evidence of how the sash was treated. Based on period practice, it is likely that it matched the trim.)

Cross sections often record the condition of paints when they were over-painted. When layers appear in discontinuous lumps we know that there was alligatoring. The subsequent paints can be seen to fill the voids. In periods of more frequent painting the layers are more even. In most of the Durant – Kenrick samples with thick layering, a very distinct point of re-painting over severe alligatoring can be seen. It appears on the clapboard samples at the point that the verdigris was painted over. (See photograph #3 of cross section #41.) The new paint, which seeped in to fill deep cracks, is the treatment that we have linked to the addition of the south door.

Moving to the trim cross sections, alligatoring analogous to that seen at the surface of the clapboard verdigris appears at the level of a light treatment with a medium tan or brown treatment, most clearly seen in the ultraviolet view, immediately below. (See photograph #2 of cross section #5.) As on the clapboard sample, the paint that filled the voids is the 1830s paint that went on with the south door. Therefore, it is the paint showing just before the alligatoring was painted over that accompanied the verdigris. Matching shows it to have been a light tan.

The same tool cannot be used on the door. Front door cross section #19 shows a thick accretion, with what appear to be many selective re-paintings around the period of interest, best seen in the ultraviolet view. (See photograph #7. The light appearing layers interspersed with the dark layers toward the bottom of the cross section in the ultraviolet view are likely clear finishes. The sample broke from the wood and therefore shows no wood substrate.) Sample #24 from the 1830s south door shows an upper paint series that matches that of the front door but differs in its earlier layers. (See photograph #8.) So it is not possible simply to subtract the south door layers and get to the target door treatment on the façade.

The first paint on the south door did not match the other 1830s elements but was rather a light pinkish or salmon. While the two cross sections do not show it, we saw fragments of a thin dark material on top of it in spots while cutting into the un-cast parts of the samples under the laboratory binocular microscope. This struck us as the wreck of wood graining which was often done over a pinkish base and which is stylistically a very believable original treatment for an exterior door of this age. If this is true, and because it is difficult to grain effectively over long-exposed irregular paint films, it may be that the front door brown accompanied the graining and was intended to blend with it. In any case, the layering suggests that the target period door treatment is among the several early dark treatments.

With no way to determine with certainty which of the door treatments went on with the verdigris clapboards, and because the upper ones of the thick dark pre-brown series all appeared to be near identical blacks, we exposed and matched the last of them.

Color Matches

Areas of the target paints were uncovered mechanically on the un-cast portions of the samples. These were "light bleached" for at least two weeks under a GE F15T8-CW fluorescent tube to reverse the darkening and yellowing of linseed oil binder components when kept out of the light by subsequent paints. After light bleaching we measured the trim and door samples with a Minolta CR 241 Chromameter in the CIE L*a*b* and Munsell color systems. We then chose the closest chips in one of four commercial paint lines, old and new Benjamin Moore and old and new Sherwin Williams. These we also measured in both color systems. We then computed the "Delta E" value, a measure of color difference, between the sample and match measures. The printing industry accepts Delta E values of up to 6.0.

The clapboard paint is very degraded, which is typical of early greens mixed with verdigris, an unstable pigment. We have in hand no sample that shows the paint as it would have looked originally. But the samples did show that the paint had been a very high chroma (bright) darkish green. Looking as best we could at the tiny brighter spots in the samples, and using a dispersed slide (from the McCrone Institute, Westmont, IL) of pure verdigris for comparison, we chose a number of chips in the four commercial color lines as possibilities. We also looked for available paints mixed to mimic period verdigris treatments. We were very happy with a chip from Colonial Williamsburg's line of researched paint colors and recommend its use here.

CIE L*a*b* This is the present standard industry color measurement system. The "L" number is a measure of darkness from 0 (black) to 100 (pure white). The "a" value runs from green (negative) to red (positive). The "b" value runs from blue (negative) to yellow (positive). Higher numbers reflect a greater concentration of that color.

Munsell Munsell is a somewhat antiquated system, but is very user-friendly (to those who have its chip books) and is widely used in preservation. In the Munsell system the letter designations indicate hue, breaking the color wheel into eight parts: R (red), YR, Y (yellow), GY, G (green), BG, B (blue), PB, P (purple), and RP. The letters' prefix numbers break each hue division into gradations from 0 to 10. The one place decimal number preceding the back slash is a 1 to 10 measure of darkness, with higher numbers representing lighter colors. The one place decimal number after the back slash is a measure of chroma or color intensity starting at zero. Low numbers represent grays while higher numbers, sometimes exceeding 10, reflect increasing brightness.

	CIE L*a*b*	Munsell
<u>Target period trim</u>		
Sample. Tan	L 75.20 a -0.65 b +12.15	3.8 Y 7.4 / 1.7
Match. SW 2065	L 74.05 a -0.50 b +13.74	3.5 Y 7.3 / 1.9
Delta E	1.97	

<u>Target period clapboards</u>

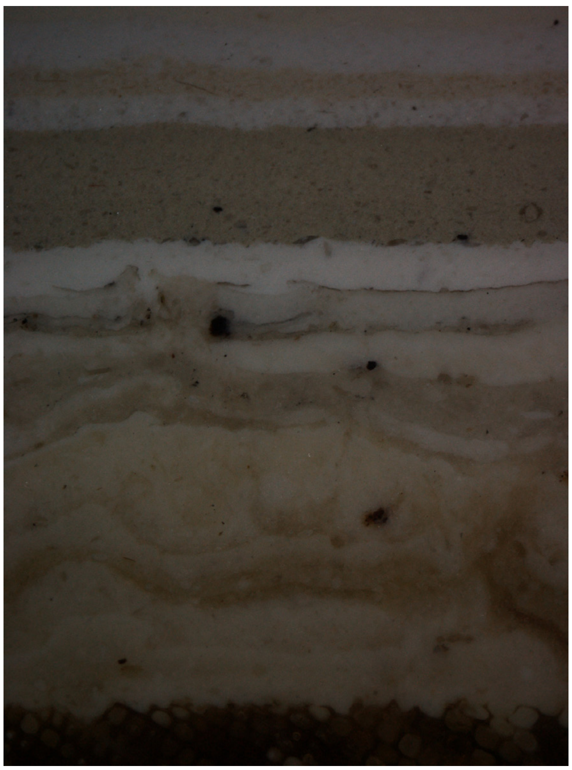
Sample. Deep verdigris green, very degraded
Suggested match. Colonial Williamsburg color CW 509
Delta E Not applicable
CW 509 chip not available. Closest Benjamin Moore chip used to illustrate color.

	CIE L*a*b*	Munsell
<u>Target period door</u>		
Sample. Black	L 27.43 a -2.76 b +1.32	2.8 G 2.6 / 0.5
Match. SW 2252	L 32.71 a -3.00 b +0.34	9.7 G 3.2 / 0.5
Delta E	5.38	

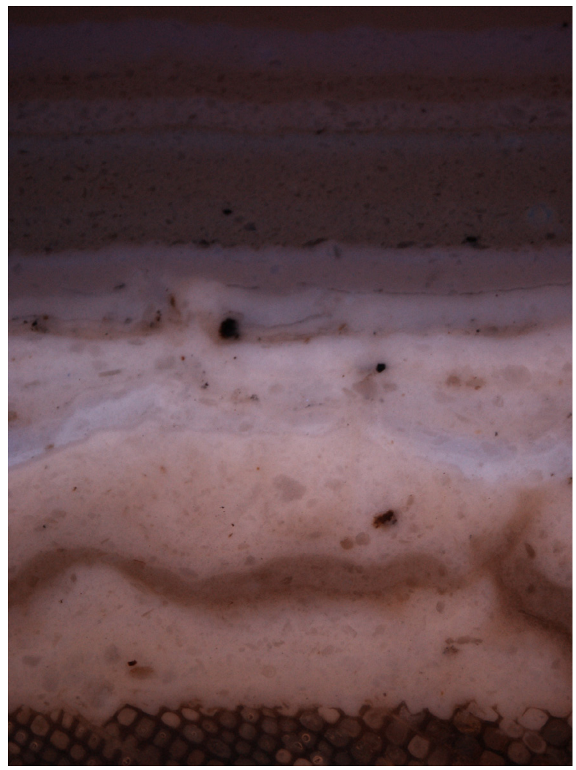
SAMPLES AND CROSS SECTIONS

1. Window architrave. Façade (west wall). 3rd first floor window (of 4) from south. North stile fascia.
2. Window architrave. Façade (west wall). 2nd first floor window (of 4) from south. North stile fascia.
3. Window architrave. Façade (west wall). 2nd second floor window from south (of 5). South stile fascia.
4. Window architrave. North wall. 2nd first floor window from west (of 4). West stile fascia.
5. Window architrave. North wall. Far east first floor window (of 4). East stile fascia.
6. Window architrave. North wall. Far east 2nd second floor window (of 3). West stile.
7. Window architrave. North wall. Attic window. East stile architrave.
8. Window architrave. South wall. Far east first floor window (of 4). West stile fascia.
9. Window architrave. South wall. Attic window. Edge molding of top rail.
10. Window architrave. East (rear) wall. Far south first floor window (of 3). South stile.
11. Window architrave. East (rear) wall. 2nd window from south (of 3). South stile.
12. Front door architrave. Soffit of top cap. To south.
13. Front door architrave. Frieze below dentils. To south.
14. Front door architrave. Pilaster backing board. South side near top.
15. Front door architrave. South pilaster. North side reveal of upper neck below capital.
16. Front door architrave. South pilaster. North side reveal of shaft. West flute (of 2) near top.
17. Front door architrave. Surround of door and transom light. South stile, inner fascia. Near top.
18. Front door architrave. Transom sash. South stile.
19. Front door. Upper south stile.
20. Front door. Field of upper south panel (of 6).
21. South door architrave. Top rail. Central roll to west.
22. South door architrave. Reveal of east side sidelight. West side. Low.
23. South door architrave. Reveal of west side sidelight. East side. High.
24. South door. Upper east stile.
25. South door. Field of upper east panel (of 6).
26. Façade cornice. Soffit. Between 1st and 2nd windows from south.
27. Façade cornice. Soffit. Between 2nd and 3rd window from south.
28. Facade cornice. Bed molding. Between 1st and 2nd windows from south.
29. Façade cornice. Bed molding. Between 2nd and 3rd windows from south.
30. Façade cornice. Fascia below bed molding. Between 1st and 2nd windows from south.
31. Façade cornice. Fascia below bed molding. Between 2nd and 3rd windows from south.
32. Raking eave board. North wall. Long east roof slope. Piece to east (of 2). Near other piece.
33. Raking eave board. North wall. Long east roof slope. Piece to west (of 2). Near other piece.
34. Raking eave board. South wall. East side of apex. Upper edge molding.
35. Raking eave board. South wall. Long east roof slope. Shorter piece to west (of 2). Near apex eaves board.

36. Clapboard. Façade (west wall). Just to north of front door architrave. 15th up from bottom.
37. Clapboard. Façade (west wall). Immediately below farthest south first floor window (of 4).
38. Clapboard. Façade (west wall). Immediately below 2nd first floor window from south (of 4).
39. Clapboard. Façade (west wall). Between 1st and 2nd second floor windows (of 5) from south. Top clapboard.
40. Clapboard. Façade (west wall). Between 2nd and 3rd second floor windows (of 5) from south. Top clapboard.
41. Clapboard. North wall. To east of 2nd first floor window from west (of 4). 17th up from bottom.
42. Clapboard. North wall. To east of far east first floor window (of 4). Approximately eye level. (Lower clapboards removed.)
43. Clapboard. North wall. High, near meeting point of two lengths of raking eave board on long east roof pitch.
44. Clapboard. North wall. High, near meeting point of two lengths of raking eave board on long east roof pitch.
45. Clapboard. South wall. Immediately below far west first floor window (of 4).
46. Clapboard. South wall. Immediately below far east first floor window.
47. Clapboard. South wall. Attic level to west of old roof line shown in clapboards.
48. Clapboard. South wall. Attic level to east of old roof line shown in clapboards.
49. Clapboard. East (rear) wall. To south of far south first floor window (of 3). 11th up from bottom.
50. Clapboard. East (rear) wall. To south of 2nd first floor window from south (of 3). 11th up from bottom.
51. Clapboard. East (rear) wall. In south side strip where rear porch post was removed.
52. Sash. Façade (west wall). 3rd first floor window from south (of 3). Lower sash. Lower rail.
53. Sash. Façade (west wall). Far south first floor window (of 4). Lower sash. Lower rail.
54. Sash. North wall. 2nd window from west (of 4). Lower sash. Lower rail.
55. Sash. North wall. Far east first floor window (of 4). Lower sash. Lower rail.
56. Sash. South wall. 2nd first floor window (of 4) from east. Lower sash. Lower rail.

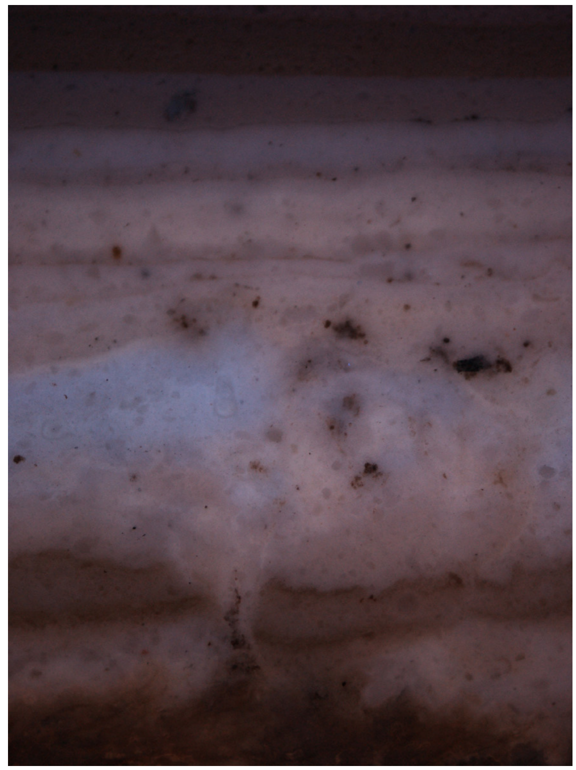


Photograph 1a. Cross section 15. Front door architrave. South pilaster. North side reveal of upper neck below capital. Visible light. 125x

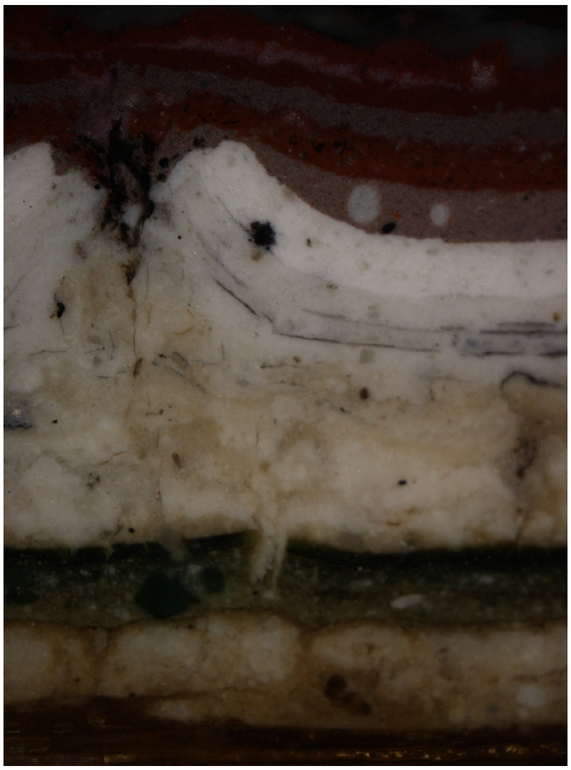


Photograph 1b. Cross section 15. Ultraviolet light. 125x

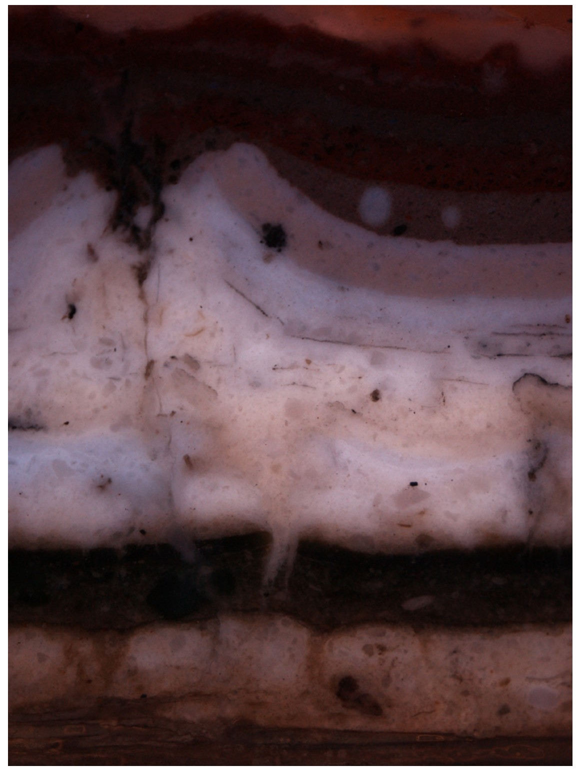
Photograph 2a. Cross section 5. Window architrave. North wall. Far east first floor window (of 4). East stile fascia. Visible light. 125x



Photograph 2b. Cross section 5. Ultraviolet light. 125x.



Photograph 3a. Cross section 41. Clapboard. North wall. To east of 2nd first floor window from west (of 4). 17th up from bottom. Visible light. 125x



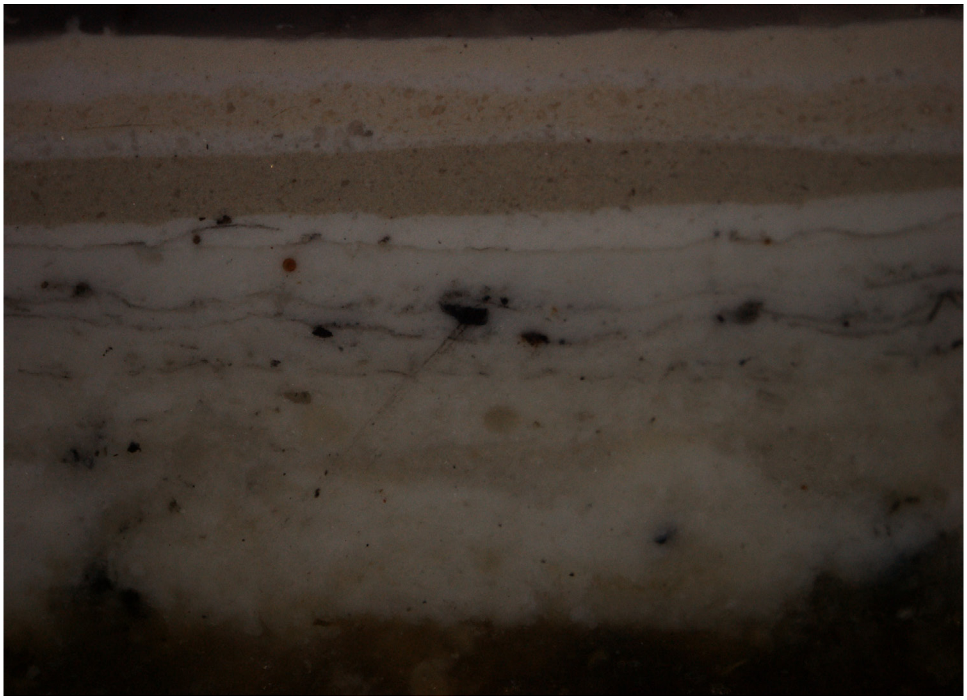
Photograph 3b. Cross section 41. Ultraviolet light. 125x.

Photograph 4a. Cross section 48. Clapboard. South wall. Attic level to east of old roof line shown in clapboards. Visible light. 125x

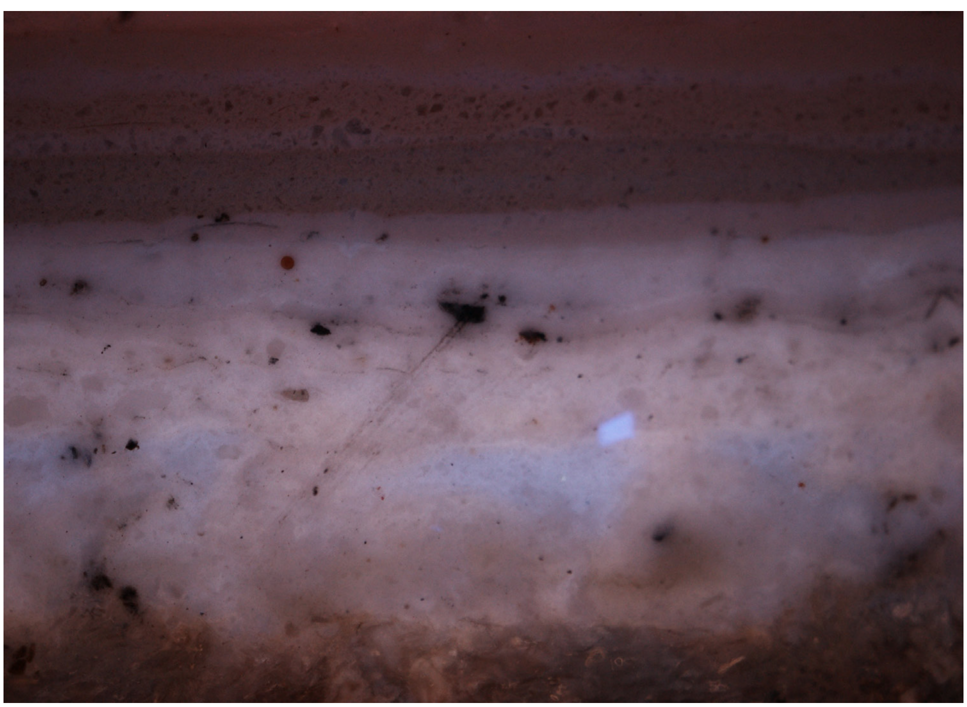
Photograph 4b. Cross section 48. Ultraviolet light. 125x.

Photograph 5a. Cross section 26. Façade cornice. Soffit. Between 1st and 2nd windows from south. Visible light. 125x

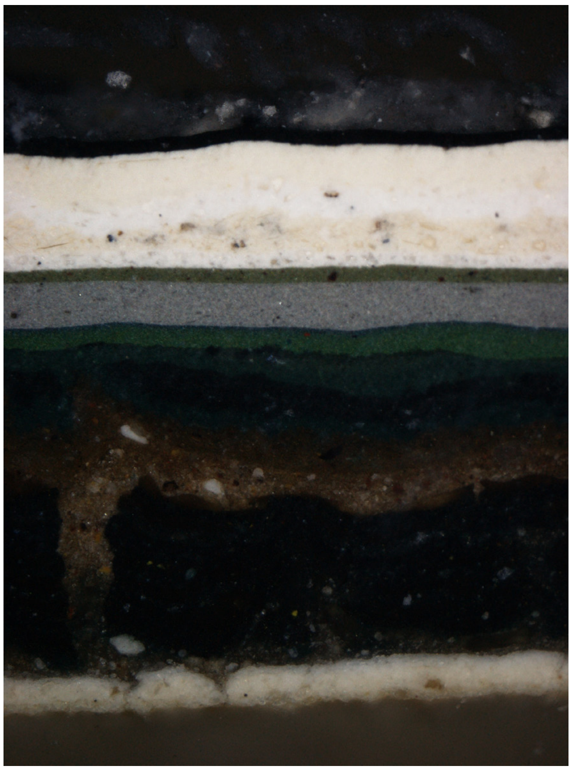
Photograph 5b. Cross section 26. Ultraviolet light. 125x.



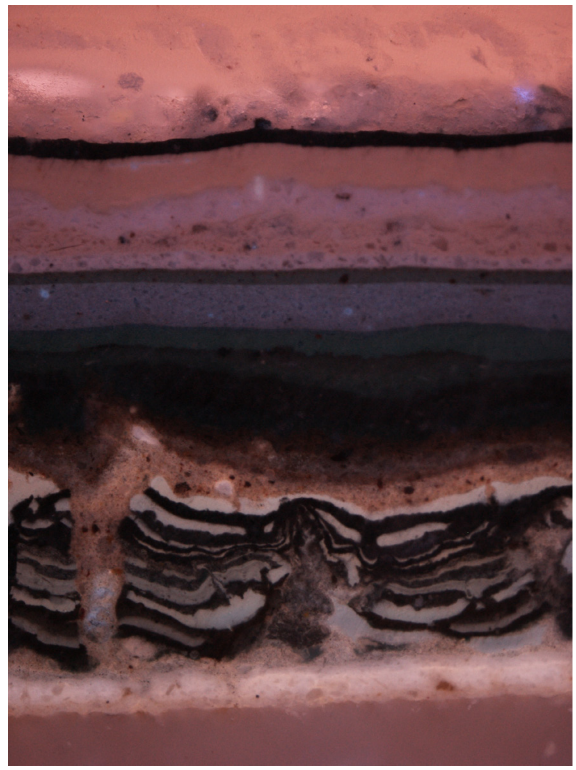
Photograph 6a. Cross section 23. South door architrave. Reveal of west side sidelight. East side. High. Visible light. 125x



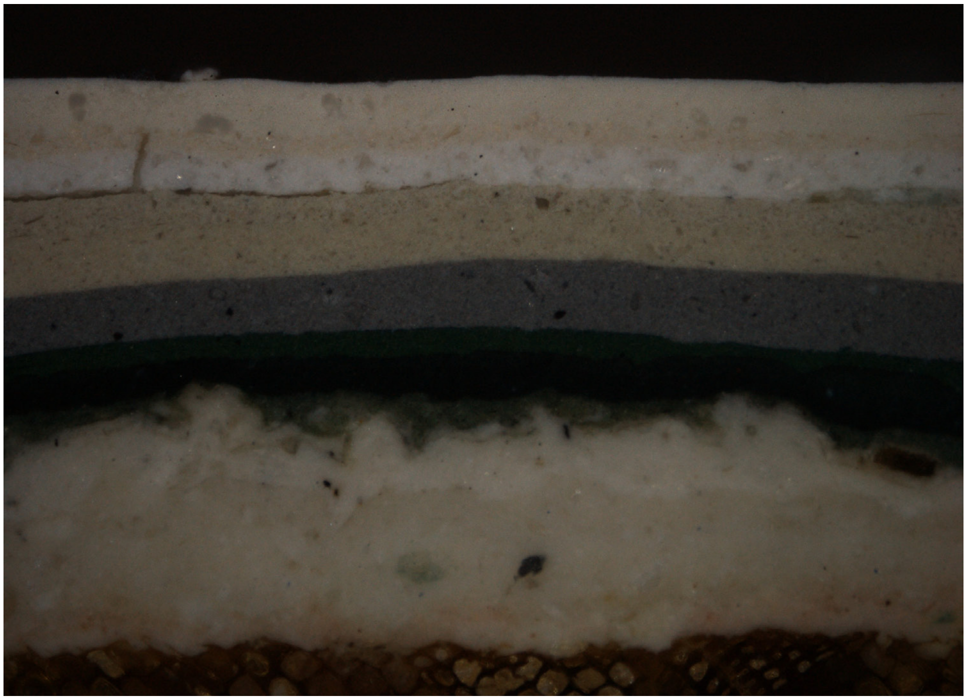
Photograph 6b. Cross section 23. Ultraviolet light. 125x.



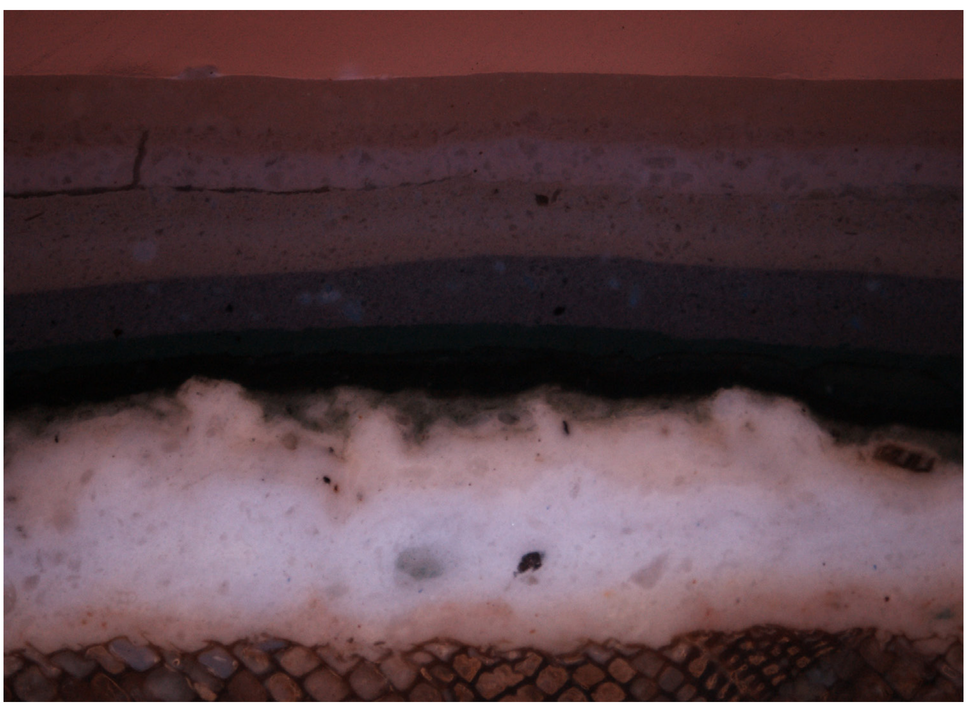
Photograph 7a. Cross section 19. Front door. Upper south stile.Visible light. 125x



Photograph 7b. Cross section 19. Ultraviolet light. 125x.



Photograph 8a. Cross section 24. South door. Upper east stile. Visible light. 125x



Photograph 8b. Cross section 24. Ultraviolet light. 125x.