CONDITION ASSESSMENT AND RECOMMENDATIONS

Preservation of the Hildreth House

Harvard, Massachusetts

prepared for the

Town of Harvard

by

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SUMMARY RECOMMENDATIONS

The following recommendations resulting from the Architectural Condition Assessment of the Hildreth House are presented in order of their appearance in the report narrative. These are repeated in *Appendix A* as a prioritized list.

Recommendations summarize, for planning purposes, the general interventions required. In most instances, further design of treatments is necessary before they can actually be applied. Costs are expressed in order-of-magnitude estimates, for contracted construction work (excluding design and contingency), in 2004 dollars. These are intended for rough budgeting purposes only, and would normally be refined during the process of design and preparation of contract plans and specifications.

1.0 INTRODUCTION

1.1 Description

1.2 Methodology

1.3 Treatment Philosophy

R1.3-1 *Prepare an Historic Structure Report that incorporates and augments existing archival research on the Hildreth House along with a detailed physical analysis of exterior and interior features in order to provide a complete understanding of its evolution. The report should characterize the relative significance of each feature, and recommend their ultimate dispositions with respect to any future maintenance or alteration of the structure. (Range depending on scope - $10,000 - $25,000)*

2.0 SITE

2.1 Site Vegetation: $0

R2.1-1 *Prune shrubbery along the east veranda to minimize physical contact with the shingled surfaces. (Volunteer Labor) ($N/A)*

R2.1-2 *Remove vines growing on the west veranda and prune shrubbery to minimize physical contact with the shingled surfaces. Also remove volunteer trees growing within 10 feet of the veranda. (Volunteer Labor) ($N/A)*

R2.1-3 *Remove abandoned planter pots and boxes, as well as other discarded items, from the west veranda and adjacent to its stairway. Also sweep leaves and accumulated dead vegetation from the east and west verandas.* *(Volunteer Labor)* *($N/A)*

2.2 Site Drainage **$23,125**

R2.2-1 *Fill all sinkholes, burrows, depressions, and scours adjacent to the masonry foundation. Add limited quantities of soil along perimeter of foundation to achieve a positive gradient away from the building. Also re-grade existing soil in the crawlspaces of the south and east verandas to slope away from the main building foundations. Note that it may not be possible to achieve appropriate gradients in all areas due to other localized conditions such as driveway pavements or low-lying windowsills. Avoid creating new depressions adjacent to these.* *($1,900)*

R2.2-2 *Provide historically appropriate masonry surface troughs to receive water from conductors on the east, north, and west elevations that currently discharge into open air, and direct the runoff sufficiently away from the building.* *($2,600)*

R2.2-3 *Provide historically appropriate masonry areaway to allow unearthing of the sill of the westerly cellar window on the north elevation. Provide areaway drainage into the conductor drain adjacent to the west.* *($2,700)*

R2.2-4 *Re-grade areaway outside the westerly cellar door to remove earth from sill and lower reaches of the door itself, and slope to achieve positive drainage down the embankment to the west. The embankment flanking the areaway on the south may require stabilization to prevent future encroachment on the doorway.* *($1,700)*

R2.2-5 *Reinstate drains serving the 3 south veranda conductors so that water is received directly into respective historic cast iron boots and is piped through the veranda foundation wall into the crawlspace. Intercept the cast iron lines in the crawlspace with a new PVC trunk line directed through the west end of the south veranda foundation below grade, discharging to daylight sufficiently down the embankment to the west. Also install new cast iron boot and PVC drain to receive discharge from conductor at southwest corner of south elevation (adjacent to west veranda stair) and connect below grade to the new trunk serving the south veranda conductors. Cap and abandon in place the remaining portions of the cast iron drains.* *($5,250)*

R2.2-6 *Cap the leg of the wye fitting in the cast iron drain along the interior of the north cellar wall.* *($ 75)*

R2.2-7 *Intercept the 3 cast iron drains penetrating the north wall of the cellar with new PVC trunk line immediately inside the cellar wall. Run new trunk along general route of existing lines, penetrating the floor where the cellar extends* *beneath the west veranda. Direct the trunk below grade beneath the cellar doorway and discharge to daylight sufficiently down the embankment to the west. Add an areaway drain immediately outside the cellar door and connect to the new PVC trunk passing beneath.* *($5,500)*

R2.2-8 *Add new drains in the bottoms of the three areaways in the north terrace. Pipe the discharge through the north cellar wall and tie into the new PVC trunk installed per Recommendation R2.2-7.* *($3,400)*

3.0 EXTERIOR ENVELOPE

3.1 Foundations $3,700

R3.1-1 *Repoint the easterly end of the north elevation with appropriate sand-lime mix (approximately 30% of surface area), addressing open and extensively weathered joints, as well as inappropriate prior Portland cement repairs. Recover and reset missing foundation stones beneath the sill of the latticed opening at the northerly end of the east veranda.* *($ 650)*

R3.1-2 *Repoint the westerly end of the south veranda with appropriate sand-lime mix (approximately 30% of surface area), addressing open and extensively weathered joints, as well as inappropriate prior Portland cement repairs.* *($ 400)*

R3.1-3 *Repoint developed settlement cracks at the northwest corner of the north elevation, and the southwest corner of the south veranda with appropriate sand-lime mix. Reset displaced stones and repoint northwest corner of west veranda. Localized excavation may be required to reveal the full extent of the cracking systems and displacements. Also repoint interior northwest corner of cellar wall at corresponding crack location.* *($1,150)*

R3.1-4 *Pack with oakum and repoint around cellar door and window frames with appropriate sand-lime mix (approximately 75% of total perimeter length), addressing open and extensively weathered joints.* *($1,200)*

R3.1.5 *Install (from interior) sealant around all below-grade pipe penetrations of the north and south cellar walls.* *($ 300)*

3.2 North Terrace $17,050

R3.2-1 *Remove all vegetation growing in the joints of the terrace paving, reset all heaved brick pavers, and re-grout the joints with a dry sand-lime mix that is dampened after placement.* *($1,600)*

R3.2-2 *Repoint all head and bed joints of the perimeter sandstone copings with appropriate sand-lime mix.* *($ 850)*

R3.2-3 *Remove areaway glazing to access the respective iron frames. Remove loose corrosion, passivate the surfaces, prime with a zinc-rich primer, and* *paint. Reset the glazing with a sealant that is visually and physically compatible with the paint system employed.* *($ 850)*

R3.2-4 *Carefully remove paving from a 1-foot wide zone along the entire length of engagement with the wood framed walls. Inspect the condition of the buried wood sheathing and framing, and replace deteriorated elements with borate-treated materials as required. Reinstall masonry paving incorporating a membrane and a 1-inch air gap between paving and wood elements. Cover open top of the air gap with lead-coated copper counter flashing integrated into the base course of shingles above.* *($6,150)*

R3.2-5 *Reconstruct north terrace balustrade, matching profiles and configurations of original west balcony balustrade. Augment with sympathetically designed code-compliant guard and handrails.* *($7,600)*

3.3 Chimneys $5,850

R3.3-1 *When the south slopes of the main gambrel roof are reshingled, document and remove the ferrous trellis system and associated anchors. Inspect and provide repairs to caps and flues as required. Repoint deteriorated masonry joints (presuming approximately 30% of surface area), and point in new lead counter flashings to receive base flashings provided during the reshingling.* *($5,850)*

3.4 Roofing and Flashing $19,295

R3.4-1 *Remove existing and replace shingles on the south upper and lower slopes of the main gambrel roof, also replacing in-kind any deteriorated roof sheathing encountered. Incorporate new lead coated copper flashings at intermediate ridges and chimney bases, and in the apron zone along the veranda roof interfaces. Incorporate wood shingle drips along eaves and rakes. Underlay all flashings, as well as all ridges, closed valleys, eaves, and rakes, with bituminous polyethylene membrane.* *($9,705)*

R3.4-2 *Remove existing and replace shingles on the south, east, and west veranda roofs, also replacing in-kind any deteriorated roof sheathing encountered. Incorporate new lead coated copper base and apron flashings at junctures with adjacent roof and wall planes. Underlay all flashings, as well as all ridges and eaves with bituminous polyethylene membrane.* *($9,590)*

3.5 Gutters and Conductors $5,130

R3.5-1 *Replace in kind any conductor sections that are heavily corroded or perforated. Where conductor drains have been reinstated, extend conductors to engage them. Configure conductor connection with drain to enable easy removal of conductor for cleaning. Where masonry surface troughs have been installed, extend lengths of respective conductors so that discharge elbows lay directly in them.* *($1,720)*

R3.5-2 *Passivate existing corrosion, prime with zinc-rich primer, and paint conductors the selected wall shingle color.* *($2,650)*

R3.5-3 *Remove all conductor hangers from veranda wall caps and relocate them to the first course of shingles below the caps. Custom-length pintles or discretely placed blocking may be required.* *($ 390)*

R3.5-3 *Remove galvanized half-round gutter from north elevation west dormer, and seal all holes left by removed anchorages.* *($ 370)*

3.6 Rakes, Eaves, Soffits, and Miscellaneous Trim $12,975

R3.6-1 *Reinstall missing soffit shingles and replace in-kind any damaged shingles.* *($ 600)*

R3.6-2 *Replace in-kind the fascias above the north elevation gutters on both the east and west wings. Clad with flat lock-seam lead coated copper, extending under the bottom course of roof shingles. Extend cladding into troughs of respective gutters and cleat to outer lips to form a lining. Prime the cladding and paint the selected trim color.* *($4,100)*

R3.6-3 *Execute epoxy or spliced infill patching of south elevation eave trim, paying particular attention to the cornices above the octagonal bays. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.* *($2,300)*

R3.6-4 *Execute minor epoxy patching of east elevation rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.* *($2,250)*

R3.6-5 *Execute minor epoxy patching of west elevation rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.* *($2,250)*

R3.6-6 *Execute minor epoxy patching of north elevation eave and rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.* *($1,475)*

3.7 Wall Cladding $18,185

R3.7-1 *Remove existing and reshingle all south veranda outside wall surfaces below the parapet cap, as well as all wall surfaces comprising the the second story dormers.* *($5,695)*

R3.7-2 *Remove existing and reshingle all east veranda outside wall surfaces below the parapet cap, as well as all areas above the east veranda roof.* *($5,580)*

R3.7-3 *Remove and reshingle all west veranda outside wall surfaces below the parapet cap, as well as all areas above the veranda roof and balcony deck, and approximately 20% of shingles below the balcony deck. Also remove and reshingle the west outside wall of the south veranda.* *($5,285)*

R3.7-4 *Remove and reshingle approximately 5% of the north outside wall of the east veranda, plus miscellaneous shingles around the electrical meter and the lower outside west corner of the east wing, and approximately 5% of the northerly face of the west wing. Also remove and reshingle 10% of the three respective wall surfaces adjoining the paved terrace. In addition, remove and reshingle the bottom 3 courses of the same three wall surfaces, incorporating new hidden lead-coated copper counter flashings to cover air-gaps introduced during restoration of the north terrace.* *($1,445)*

R3.7-5 *Remove and replace individual shingles at outside corners where joints have opened or shingles have split due to inappropriate edge nailing.* *($ 180)*

3.8 Verandas and Balconies $18,830

R3.8-1 *Create scuppers through the screen frame sill at the floor of the west veranda to allow drainage of the northerly portion. Scuppers should be flashed with copper, which is in turn sealed to the respective canvas membranes on either side of the sill.* *($ 550)*

R3.8-2 *Execute epoxy or spliced infill patching of veranda parapet caps and bed moldings, paying particular attention to the end joints at the respective posts. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.* *($2,300)*

R3.8-3 *Execute epoxy or spliced infill patching of veranda post and entablature facings. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.* *($2,900)*

R3.8-4 *Renail all failed veranda ceiling anchorages. Prepare, prime, and paint selected trim color.* *($4,030)*

R3.8-5 *Carefully remove flooring at southeast corner of south veranda to inspect condition of framing. Augment support as required and reinstall flooring. Prepare, prime, and paint all veranda floors with gray deck enamel.* *($1,450)*

R3.8-6 *Document and carefully remove decking, balustrade, and awning frame from west balcony. Replace roll roofing with new to match existing, complete with bituminous polyethylene underlayment and lead coated copper flashings. Install new balcony sleepers and decking matching original configurations. Reproduce deteriorated balustrade and awning frame elements. Preservative treat and prime all reproduction and remaining original wood balustrade and awning frame elements, and reinstall. Paint completed work with selected trim color.* *($7,600)*

3.9 Exterior Stairs and Ramps $18,250

R3.9-1 *Remove existing and reconstruct new code-compliant south veranda stair, detailed to be visually compatible with the historic setting. ($2,350)*

R3.9-2 *Replace missing stair formerly serving the north elevation west wing doorway with new code-compliant stair, detailed to be visually compatible with the historic setting. ($2,700)*

R3.9-3 *Remove existing and reconstruct new code-compliant stair to serve the north elevation east wing doorway, utilizing existing concrete footings. ($2,350)*

R3.9-4 *Remove deteriorated ramp baluster caps, and alter ramp wall height to match elevation of veranda walls. Install wood shingle cladding in lieu of MDO plywood on interior faces of ramp walls. Install new plank caps with reconfigured profile and butt joints, and new bed moldings beneath. Install new pipe rail guards at same elevation as veranda guards. Pre-treat all new wood elements with borate solution and full priming. Caulk and paint all trim elements with at least two coats of selected trim paint, and apply at least two coats of stain to all shingles. ($8,900)*

R3.9-5 *Add code-compliant railings to west veranda stair, detailed to be visually compatible with the historic setting. ($1,950)*

3.10 Doors, Windows, and Blinds $63,680

R3.10-1 *Document locations and remove all surviving exterior window blinds, including any fragments thereof as well as those lying loose around the site. Store in attic for future repair. ($ 500)*

R3.10-2 *Remove window sashes having broken lights or deteriorated joints (approximately 26 units) and execute epoxy or pieced-in repairs and reglazing as required. Prime and paint sash prior to reinstalling. ($10,400)*

R3.10-3 *Remove exterior storm units and execute epoxy repairs to deteriorated casings and sills of second and attic story windows on the south, east, and west elevations (approximately 14 units). Prime and paint selected trim color, and reinstall storm units. ($5,600)*

R3.10-4 *Remove exterior storm units and execute epoxy and pieced-in repairs to deteriorated casings and sills of first, second, and third story windows on the north elevation (approximately 6 units) south, east, and west elevations. Prime and paint selected trim color, and reinstall storm units. ($2,400)*

R3.10-5 *Prepare, prime and paint all sashes, doors, storm units, and trim (not otherwise painted in the course of repairs) with respective selected trim, sash, and door colors. ($14,500)*

R3.10-6 *Fabricate and install new aluminum storm panels for attic story windows and west elevation oval window, configured in a manner to allow operation of the sash for ventilation. Remove and store existing wood storm panel covering oval window. Prime and paint new units the selected sash color.* *($1,755)*

R3.10-7 *Remove existing west elevation cellar door and execute epoxy or pieced-in repairs as required. Prime and paint with selected door leaf color prior to reinstalling. Also execute epoxy or pieced-in repairs to lower frames and sill. Prime and paint selected trim color.* *($1,650)*

R3.10-8 *Remove existing cellar and veranda crawlspace sash and panels where frames are deteriorated. Execute epoxy or pieced-in repairs to frames, and reinstate appropriate staff beads where missing. Prime and paint frames the selected trim color. Repair existing east veranda lattice with in-kind materials fabricate new appropriately detailed lattice to replace that missing from the west end of the south veranda. Execute epoxy or pieced-in repairs and reglazing as required on all cellar sashes, and furnish new to match existing where missing. Prime and paint sashes prior to reinstalling. Repair, prime, paint, and reinstall wood security panels over cellar sash if required, or fabricate and install new glazed aluminum storm panels set recessed into respective frames, and painted the selected sash color.* *($4,650)*

R3.10-9 *Remove for inspection the plywood covering of the crawlspace access door off the north terrace. Execute epoxy or pieced-in repairs to door if extant, or replace with new beaded matchboard and batten door if original is missing. Treat all new materials with borate solution, and prime and paint selected door leaf color.* *($ 750)*

R3.10-10 *Execute epoxy or pieced-in repairs to substantially intact window blinds as required (approximately 22 panels). Prime and paint selected blind color prior to reinstalling. Retain all non-viable units in attic storage for future reference and repair stock.* *($5,575)*

R3.10-11 *Remove existing aluminum storm doors and replace with new units comprised of single large glazed area with minimum enframement. Obtain new units in factory colors matching existing door leafs or field paint to match.* *($3,300)*

R3.10-12 *Fabricate reproduction blinds and hardware from in-kind materials where units are missing. Treat all new materials with borate solution, and prime and paint selected blind color prior to installing.* *($12,600)*

3.11 Miscellaneous Hardware and Fittings $750

R3.11-1 *Retain abandoned historic hardware in place where its presence is benign. Passivate corrosion, prime, and paint selected trim or shingle color as appropriate. Document, remove, and store in attic any* *abandoned hardware that cannot otherwise be prevented from causing deterioration to adjacent historic fabric.* *($750)*

3.12 Exterior Finishes **$25,675**

R3.12-1 *Prepare, prime, and paint all remaining shingled wall surfaces with two finish coats of opaque stain in selected body color.* *($11,350)*

R3.12-2 *Prepare, prime, caulk, and paint all remaining eaves, rakes, ceilings, soffits and trim with two finish coats of alkyd paint, in selected trim color.* *($9,225)*

R3.12-3 *Prepare, prime, and paint all floors and treads with two finish coats of gray deck enamel.* *($3,600)*

R3.12-4 *Prepare, prime, caulk, and paint all window sashes, and window and door trim with two finish coats of alkyd paint, in selected trim color.* *(Estimated in Section 3.10)* *($N/A)*

R3.12-5 *Prepare, prime, caulk, and paint all door leafs and blinds with two finish coats of alkyd paint, in selected door color.* *(Estimated in Section 3.10)* *($N/A)*

R3.12-6 *Treat troughs of all wood gutters with solvent-based preservative and recoat mastic trough splices. Prepare, prime, caulk, and paint all outer gutter surfaces with two coats of alkyd paint, in selected trim color.* *($1,500)*

3.13 Exterior Lighting **$1,000**

R3.13-1 *Reinstall missing globes on verandah ceiling light fixtures.* *(Volunteer Labor)* *($N/A)*

R3.13-2 *Ensure that covers are properly installed on all exterior junction boxes.* *($ 250)*

R3.13-3 *Prepare, prime, and paint all exposed conduits, boxes, and louvered diffusers the selected trim color.* *($ 750)*

4.0 ENVIRONMENTS

4.1 Measurement

4.2 Observations **$4,150**

R4.2-1 *Operate portable dehumidifier in the cellar from late spring to early autumn on an as-needed basis to reduce excessive relative humidity* *levels. Configure so that condensate is piped to drain, rather than accumulating in a reservoir.* *($ 650)*

R4.2-2 *Conduct digital electronic monitoring of psychrometric conditions for a period of one year, to determine the full extent of the humidity problem and the most optimal and cost-effective measures for humidity control.* *($3,500)*

5.0 UTILITIES

5.1 Electrical Service $3,500

R5.1-1 *If not already done, perform a survey of the entire electrical system beginning with the service entrance and main panel. Identify the types, locations, and condition of all fixtures and devices served by each branch, as well as the adequacy of the wiring and connections thereto. Clearly identify all branches at the respective main and sub panels.* *($3,500)*

5.2 Telephone and Cable Television Services $1,450

R5.2-1 *Reconfigure cable television service to enter the building from a new terminal box situated adjacent to the telephone terminal box. Relocate all existing branches to the interior, fishing conductors through walls to terminate at wall plates.* *($1,450)*

5.3 Gas Service $350

R5.3-1 *Patch sites of abandoned service entries near gas meter by plugging both sheathing and sill, and replacing the associated shingles.* *($ 350)*

5.4 Fuel Oil Storage $350

R5.4-1 *Determine the source of oil staining beneath the oil tank filter, and secure any leaking connections noted. Clean stain with poultice media and maintain tray as required to contain any future spills.* *($ 350)*

5.5 Domestic Water

5.6 Sanitary Drainage $4,150

R5.6-1 *Survey the configuration and condition of the sanitary drainage system from the point of entry into the cellar floor to its final termination, and upgrade, repair, or replace components as required in accordance with the results thereof.* *($2,750)*

R5.6-2 *Rehabilitate existing floor drain and install additional floor drain at base of stair inside the west cellar door.* *($1,400)*

CONDITION ASSESSMENT AND RECOMMENDATIONS:
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Harvard, Massachusetts

1.0 INTRODUCTION

This assessment of the Hildreth House was commissioned by the Town of Harvard for the purposes of characterizing the general exterior condition of the structure and identifying both the immediate and long-term threats to its continued preservation.

1.1 Description

The Hildreth House is a gambrel-roofed wood framed structure nearly rectangular in plan, of the late 19th century shingled genre. The structure includes a substantial cellar, two full principal stories, and a third story or attic containing a hall and two finished rooms. Broad verandas and prominent rooflines dominate the main facades, which are trimmed with simple detailing incorporating hints of classical motifs. The house sits astride the southerly crest of Pin Hill overlooking the Town Common.

The principal eave-fronted façade of the house is oriented 45 degrees west of south (SW) by the compass, however for purposes of this report it is noted as facing south (Fig. 1). The gabled ends thereby face east and west respectively (Figs. 2, 3), and the rear façade is north (Figs. 4, 5). At the middle of the north elevation, a recess cut into what would otherwise be a rectangular building plan accommodates a paved exterior terrace. In contrast to the verandas, the terrace is not roofed. The effect on this feature on the elevation is to create two apparent wings flanking on the east and west. Although of differing dimension, these are outwardly similar in appearance. As with the other principal facades, the idea of symmetry is suggested but does not rigorously control the massing and fenestration.

According to research notes compiled by historian Nancy Reifenstein, the house was constructed in 1895 as the summer residence of Stanley Hildreth. Built in the Shingle Style and reminiscent of Rudyard Kipling's *Naulakha* near Brattleboro, Vermont, the house crowned a 70 acre estate overlooking the Common and Bare Hill Pond beyond. The property acceded to his daughter Dorothy upon his death, who retained it as a summer residence until her death. The Town of Harvard purchased the house and 5.66 acres in 1979. Through the initial efforts of the Sixty Plus Club, interest in utilizing and preserving the house has gained momentum in recent years. To this end, basic improvements have been undertaken to accommodate the club's own activities, as well as to provide offices for the Council On Aging and meeting space for various Town boards.

1.2 Methodology

In accordance with a scope of work dated March 5, 2004, field investigations commenced in April and concluded in August. The primary goal of the survey was to identify conditions threatening the long-term viability of the building envelope. To this end, the report seeks to identify and describe the pathologies implicated in any deterioration noted, and to formulate prioritized treatment recommendations. The specific recommendations are developed within the narrative of this report. They are summarized at the beginning of the report with order-of-magnitude cost estimates, and ordered into prioritized categories in Appendix A, also with cost estimates.

Throughout this report, references are made to conditions of various interior elements and systems of the Hildreth House. While the scope of this project did not include a comprehensive interior assessment, these respective features are inevitably impacted by deficiencies in the exterior envelope. Conversely, problems with internal building systems (such as plumbing and electrical) may also directly or indirectly impact the exterior envelope adversely. In such cases the causal relationships are noted, although with few exceptions, only recommendations directly relating to the contributing pathologies are offered.

A secondary goal of the survey was to assess the relative historical integrity and significance of specific elements comprising the envelope. Thus, throughout this narrative observations are made respecting the extant physical fabric in an attempt to distinguish between recent alterations and significant original features. Non-original features are further evaluated as to their compatibility with the historical context.

1.3 Treatment Philosophy

Although historically significant, it is understood that the Hildreth House is not intended to be operated as a museum property, but rather to support the above referenced functions for which it is well suited. However because of its significance to the Town, its setting overlooking the Town Hall and Common, and its status as potentially eligible for the National Register of Historic Places, any proposed maintenance activities or alterations should at a minimum be in executed in concert with the Secretary of the Interior's Standards for Treatment of Historic Properties. Such an approach will not only preserve the surviving historic integrity, but will also keep premises in good stead to qualify for consideration by the Massachusetts Preservation Projects Fund or other similar grant sources should they ever be pursued.

Prior to any removals beyond those suggested in this report, and before any attempts are made to reinstate historical configurations, an evolutionary study of the structure should be conducted to determine what changes have occurred both during and after its period of historic significance. This will not only establish a context within which the extant features can be better understood, but will help ensure that latent evidence of historical configurations will not be inadvertently destroyed in the process of effecting the removals.

R1.3-1 Recommendation: *Prepare an Historic Structure Report that incorporates and augments existing archival research on the Hildreth House along with a detailed physical analysis of exterior and interior features in order to provide a complete understanding of its evolution. The report should characterize the relative significance of each feature, and recommend their ultimate dispositions with respect to any future maintenance or alteration of the structure.*

2.0 SITE

2.1 Site Vegetation

Barring a few major exceptions, site vegetation adjacent to the structure has been reasonably well controlled. Along the south, east, and north elevations, foundation plantings are minimal, and tend to be perennial groundcovers such as hosta. Closely planted shrubs at two locations along the east veranda are beginning to overwhelm the shingled parapet, trapping moisture within the wood materials adjacent (Fig. 6).

More problematic however are numerous volunteer shrubs, vines, and young trees subsuming nearly the entire breadth of the west elevation, and particularly the west veranda (Fig. 7). Apart from rending maintenance access impossible, these impede light and air from drying adjacent wood and masonry materials alike, and foster establishment of mildews and lichens. This elevation is particularly vulnerable due to the close proximity of forestation on the west, which already limits the amount of sunlight that would normally be available. Moreover, several of the encroaching volunteers are of a size to promote clogging of gutters and conductors with fallen leaves, and to provide penetration of shingle and trim joints with vine tendrils. Unchecked growth on this side of the house has rendered mowing impossible, which in turn has enabled proliferation of poison ivy throughout the area.

Leaves and remnants of vegetation tend to accumulate in corners of the verandas, either because they have not been regularly swept out (as at the north end of the east veranda) (Fig. 8), or because abandoned planter pots and boxes tend to entrap them (as on the west veranda) (Fig. 9). These in turn hold moisture against vulnerable wood surfaces, and provide nesting for vermin.

Otherwise, deciduous and coniferous ornamentals are situated sufficiently distant from the house to cause little direct threat to the envelope itself.

R2.1-1 Recommendation: *Prune shrubbery along the east veranda to minimize physical contact with the shingled surfaces.*

R2.1-2 Recommendation: *Remove vines growing on the west veranda and prune shrubbery to minimize physical contact with the shingled surfaces. Also remove volunteer trees growing within 10 feet of the veranda.*

R2.1-3 Recommendation: *Remove abandoned planter pots and boxes, as well as other discarded items, from the west veranda and adjacent to its stairway. Also sweep leaves and accumulated dead vegetation from the east and west verandas.*

2.2 Site Drainage

Sited on the crest of a low hill, the Hildreth House would outwardly appear to enjoy relatively good site drainage. Indeed, the general direction of surface run-off tends to be away from the structure and down the hill, particularly on the west, east, and much of the south sides. Several localized conditions and features militate against this however.

The most prominent of these are the rocky outcroppings to the south, some of which rise to the elevation of the first floor of the structure. These suggest a configuration of subsurface ledge that may impede drainage in this direction. Moreover, the house is built directly on a stratum of ledge that rises from west to east. This has prevented excavation of a full cellar beneath the house, allowing only a crawlspace under the easterly third. In the easterly end of the cellar itself, the ledge is fully exposed (Fig. 10), as it is beneath the east veranda. Although not confirmable without conducting test borings or excavations, it is conceivable that water percolating through the surface around the building may be directed toward the cellar by the ledge configuration beneath. This possibility renders all the more critical the appropriate handling of both roof and ground surface run-off so that quantities of percolating water are minimized.

The verandas on the south and east, and to a lesser extent the terrace on the north, would appear to provide at least a modicum of protection in that they theoretically deposit rainfall runoff a good distance away from the foundation of the main building envelope. On the west, the house cellar extends beneath the veranda and does not enjoy this advantage, although the broad overhang of the second story balcony at the northwest corner provides some protection. Unfortunately, some of the grades immediately adjacent to these features lack sufficient pitch to carry water away, and in places, runoff is instead directed into the veranda crawlspaces or into the cellar itself. The worst of these problems tends to be in the vicinities of the conductor drains, where large quantities of water have caused subsidence and erosion. Among the numerous examples of these are:

a) East Elevation (at base of veranda):

Neither of the conductors discharges into a drain. Scouring of soil beneath the discharge directs water back through the veranda foundation, where it collects in the crawlspace (Fig. 11).

b) South Elevation:

Subsequent driveway paving and ramp construction has raised the grade near the veranda to the extent that runoff is directed into the veranda foundation. Conductor drains along this elevation have been abandoned, and the three respective conductors discharge at the base of the veranda foundation (Fig. 12). Water runs through the foundation into the crawlspace at the points of discharge. Water traverses the crawlspace beneath the south veranda to reach the south foundation wall of the main building envelope, through which it enters the cellar in significant quantities (Fig. 13). The most prominent of these is at the interior base of the south cellar wall, immediately adjacent to where the ledge rises out of the floor.

c) South Elevation (at main southwest corner):

The conductor discharges at the base of the foundation. Water runs west along the foundation beneath the west veranda stair, scouring soil along the way (Fig. 14). Water eventually finds entry at the west cellar door.

d) West Elevation:

The grade pitches from the northwest corner toward the portion of cellar projecting beneath the west veranda, encouraging percolation through that respective wall. Moreover, the deck of the northwest balcony, and the roof of the west veranda both drain via a conductor to the base of the projecting cellar wall, whereupon the discharge runs along the wall to find entry at the west cellar door. The grade approaching the west cellar door runs counter to the slope of the hillside through which the approach is cut, and substantial quantities of water are thus directed through this doorway; the threshold and lower rail of which lie partially buried in silt (Fig. 15). The cellar floor immediately within is also covered with wet silt, which is spreading through the westerly end of the cellar (Fig. 16).

e) North Elevation (at end of east veranda):

The grade is scoured and foundation stones are missing beneath the lattice sill, allowing water and animal entry (Fig. 17). A conductor at the juncture of the veranda and the main north wall discharges to the base of the wall, where water has scoured a direct path into the foundation (Fig. 18).

f) North Elevation (at east door stoop):

The grade pitches into the foundation beneath the stoop (Fig. 19).

g) North Elevation (at north terrace):

Although the raised paved terrace is capable of quickly directing rainwater away from the foundation, it poses several other liabilities. When snow or ice accumulates on the terrace and begins to melt, water finds ready entry along the juncture of the pavement and the wood framed wall of the structure (Fig. 20). Moreover, the three areaway covers are readily breeched under these conditions, and moisture access to the wall is gained via the areaways. Finally, two of the three conductor drains still in service penetrate the pavement at its inside corners. Water not fully contained by the conductor or the drain (due to their respective conditions) gains access to the wall along these.

h) North Elevation (at west end):

The sill of the boarded window adjacent to the gas meter is partially buried in earth, rendering it vulnerable to fungal attack and water infiltration (Fig. 21).

i) North Elevation (at northwest corner):

Conductor discharge is directed into a drain, but the condition of latter at some point in the past has allowed scouring, foundation subsidence, and subsequent water entry to the cellar (Fig. 22). Although the recent patching of the drain connection may have alleviated the problem, substantial quantities of water still infiltrate the cellar at the point where the drain penetrates the cellar wall (Fig. 23).

Most, if not all of the conductors previously discharged into subsurface cast iron drains. These drains generally turned inward through the adjacent foundations and traversed the veranda crawlspaces and cellar to presumably reach the main building sewer, although this can only be surmised because all such lines (conductor drains and sanitary drains alike) penetrate into the concrete cellar floor.

Storm and roof drains were often routed through buildings to lessen the problems of freezing and to access the sanitary sewer system from within. Although once commonplace, combining storm and sanitary drainage is no longer an accepted practice. Apart from overburdening the sanitary system, conductor drains running through the Hildreth House cellar greatly increase the potential for inadvertent discharge of water along interior locations en route. For example, the wye fitting in the cellar joining the two drains penetrating the north terrace has an open leg through which substantial quantities of water could escape if a clog developed downstream (Fig. 24). The condition of the conductor drains that have already been abandoned suggests that leakage into the building was already a chronic problem (Fig. 25).

Although exterior subsurface foundation drainage systems (often referred to as *French drains*) were well known in the late 19th century, it was not common practice to install them simply as a matter of course, as they might be today. No evidence of these is apparent at the Hildreth House, and it is doubtful they exist in light of the foundation construction techniques observed. While such systems would undoubtedly lessen the quantity of water introduced to the cellar walls, they can be intrusive and expensive to install in historic structures such as this. Often, remedying misdirected conductor discharges and adverse gradients produces sufficient effect. Therefore, on the premise that implementing all the following measures may render them unnecessary, subsurface foundation drainage systems are not recommended at this time. If after implementation of the measures additional mitigation is needed, then such drainage systems should be considered.

R2.2-1 Recommendation: *Fill all sinkholes, burrows, depressions, and scours adjacent to the masonry foundation. Add limited quantities of soil along perimeter of foundation to achieve a positive gradient away from the building. Also re-grade existing soil in the crawlspaces of the south and east verandas to slope away from the main building foundations. Note that it may not be possible to achieve appropriate gradients in all areas due to other localized conditions such as driveway pavements or low-lying windowsills. Avoid creating new depressions adjacent to these.*

R2.2-2 Recommendation: *Provide historically appropriate masonry surface troughs to receive water from conductors on the east, north, and west elevations that currently discharge into open air, and direct the runoff sufficiently away from the building.*

R2.2-3 Recommendation: *Provide historically appropriate masonry areaway to allow unearthing of the sill of the westerly cellar window on the north elevation. Provide areaway drainage into the conductor drain adjacent to the west.*

R2.2-4 Recommendation: *Re-grade areaway outside the westerly cellar door to remove earth from sill and lower reaches of the door itself, and slope to achieve positive drainage down the embankment to the west. The embankment flanking the areaway on the south may require stabilization to prevent future encroachment on the doorway.*

R2.2-5 Recommendation: *Reinstate drains serving the 3 south veranda conductors so that water is received directly into respective historic cast iron boots and is piped through the veranda foundation wall into the crawlspace. Intercept the cast iron lines in the crawlspace with a new PVC trunk line directed through the west end of the south veranda foundation below grade, discharging to daylight sufficiently down the embankment to the west. Also install new cast iron boot and PVC drain to receive discharge from conductor at southwest corner of south elevation (adjacent to west veranda stair) and connect below grade to the new trunk serving the south veranda conductors. Cap and abandon in place the remaining portions of the cast iron drains.*

R2.2-6 Recommendation: Cap the leg of the wye fitting in the cast iron drain along the interior of the north cellar wall.

R2.2-7 Recommendation: *Intercept the 3 cast iron drains penetrating the north wall of the cellar with new PVC trunk line immediately inside the cellar wall. Run new trunk along general route of existing lines, penetrating the floor where the cellar extends beneath the west veranda. Direct the trunk below grade beneath the cellar doorway and discharge to daylight sufficiently down the embankment to the west. Add an areaway drain immediately outside the cellar door and connect to the new PVC trunk passing beneath.*

R2.2-8 Recommendation: *Add new drains in the bottoms of the three areaways in the north terrace. Pipe the discharge through the north cellar wall and tie into the new PVC trunk installed per Recommendation R2.2-7.*

3.0 EXTERIOR ENVELOPE

3.1 Foundations

Foundations are of unfaced and uncoursed field stone rubble. A characteristic of shingle style esthetic, the rusticity of these contrasts with the smooth planarity of the shingled wall surfaces above, although the effect is only prominent on the north and west facades. Much of the rustic effect also relies on deeply recessing the mortar pointing back from the faces of the stones, particularly as field stones typically lack any semblance of arrises, or defined edges.

Above-grade portions of foundation walls are laid to a thickness of approximately 18 inches near their tops. These have a slight batter, such that the wall thickness increases on the non-exposed side. Observable beneath the south veranda, both the building envelope and veranda foundations increase in thickness to as much as 22 inches by the time the crawlspace grade is reached.

Foundation masonry appears to have been only lightly bedded in mortar, although exposed faces both on the exterior and in the cellar have been carefully pointed. By contrast, non-exposed faces as viewed from beneath the south veranda appear to pointed only in their uppermost courses (Fig. 26).

Much of the original pointing mortar survives on the building, particularly in the uppermost courses beneath the verandas. Comprised of a sand-lime mixture that is likely gauged with a natural cement, it has generally maintained tightness of bond with adjacent masonry units, has accommodated minor deformations, and has resisted undue water erosion. Minor problems are apparent however, both in the original material, and in some of the subsequent repairs:

a) South Elevation (at west end of veranda):

Prior over-watered repair mixes have shrunk from masonry units, leaving hairline cracking. Also, repair mixes are not well matched visually to adjacent historic mortar (Fig. 27, Dwg. R-1).

b) North elevation (at easterly end):

Poor grading and drainage have resulted in erosion of pointing in the far easterly pier, and along the ground line from that point to the terrace. Foundation stones are missing beneath the sill of the latticed opening (Fig. 28, Dwg. R-3).

c) North Elevation (at northwest corner):

Minor settlement, possibly due to scouring from the adjacent drain, has opened cracks in the pointing. This cracking is also observable in the cellar; extending down to the general area where the conductor drain and water service enter. Some of these joints have been inexpertly repaired and are failing again (Fig. 29, Dwg. R-3). Pointing needs to be repaired around the oil fill pipes around the corner at the north end of the west elevation.

d) West Veranda (at northwest corner):

Stones have become displaced from the lower northwest corner of the west veranda. Inadequate handling of conductor discharge is again implicated (Fig. 30, Dwg. R-4)).

e) South Veranda (at southwest corner):

A substantial settlement crack appears near the corner, although no structural distress in the framing has developed (Fig. 31, Dwg. R-4).

f) Cellar Window and Door Openings (throughout):

Pointing around cellar window and door openings in general has deteriorated (Fig. 21). These locations suffer the differential movement of the adjacent wood frames, and typically want periodic repointing. For this reason, caulks and sealants are more often employed at the interfaces of dissimilar materials in modern construction, although their use in this context would be visually inappropriate (Dwgs. R-1 – R-4).

g) North and South Cellar Walls (interior):

Below grade pipe penetrations of the north and south cellar walls provide additional routes for intermittent water entry. Maintaining perimeter sealants around pipe penetrations from the interior will lessen the infiltrations, however sealants should be installed from the exterior if there is ever occasion in the future to unearth them (Fig. 32).

The lack of careful pointing of masonry faces below grade was typical construction practice of this era. It carries no negative implications for structural integrity, as in fact the walls remain in good condition structurally. However, it renders the walls more prone to problems with water infiltration. This factor, among others, contributes to the damp conditions noted throughout the cellar. Although excavating and exposing the exterior faces to enable thorough pointing, membrane installation, and subsurface drainage installation would be a typical remedy, this approach is both intrusive and expensive. At the Hildreth House, it would be preferable to manage the other sources of cellar dampness in expectation that the overall problem could thus be reduced to tolerable levels. The exterior excavation for purposes of repointing the masonry would thus be considered only after exhausting the other treatments.

R3.1-1 Recommendation: *Repoint the easterly end of the north elevation with appropriate sand-lime mix (approximately 30% of surface area), addressing open and extensively weathered joints, as well as inappropriate prior Portland cement repairs. Recover and reset missing foundation stones beneath the sill of the latticed opening at the northerly end of the east veranda.*

R3.1-2 Recommendation: *Repoint the westerly end of the south veranda with appropriate sand-lime mix (approximately 30% of surface area), addressing open and extensively weathered joints, as well as inappropriate prior Portland cement repairs.*

R3.1-3 Recommendation: *Repoint developed settlement cracks at the northwest corner of the north elevation, and the southwest corner of the south veranda with appropriate sand-lime mix. Reset displaced stones and repoint northwest corner of west veranda. Localized excavation may be required to reveal the full extent of the cracking systems and displacements. Also repoint interior northwest corner of cellar wall at corresponding crack location.*

R3.1-4 Recommendation: *Pack with oakum and repoint around cellar door and window frames with appropriate sand-lime mix (approximately 75% of total perimeter length), addressing open and extensively weathered joints.*

R3.1.5 Recommendation: *Install (from interior) sealant around all below-grade pipe penetrations of the north cellar wall.*

3.2 North Terrace

A raised brick paved terrace tucked between the two projecting wings of the north elevation appears to be an original feature of the house. The pavement, of face bedded 11½-inch by 3¾-inch Roman brick laid in a basket weave pattern, is supported on a fieldstone platform constructed in the manner of the foundation walls. A flush-set sandstone coping borders the brick pavement along the terrace's exposed faces. The terrace engages the building walls just below the apron of the dining room north door, and provides access to grade via a short stair descending easterly off the northeast corner, which consists of one intermediate tread of the same coping stone. Along the north exterior wall of the dining room, heavy glass lights, set flush with the pavement in tripartite frames, cover three cellar window areaways. Remnants of iron pins in the coping betray the prior existence of a wooden perimeter balustrade (Fig. 33). The profile of the balustrade remains apparent in the shingling at the northeast corner of the north elevation's west wing (Fig. 34).

Although the integrity of the pavement remains substantially intact, with little heaving and no broken or missing units, the joints are heavily overgrown with organic matter (Fig. 35). The established mosses and grasses inhibit drainage, and encourage water entrapment in these joints. This renders the pavement vulnerable to mechanical damage from ice jacking in colder temperatures, which will in turn cause buckling or lateral movement of the bricks and copingstones. Worse, some of the plants taking root are of woody-stemmed varieties, which will cause similar mechanical damage with continued growth of their roots. Lack of adequate drainage from the terrace is evident in the proliferation of lichens firmly established on the brick faces.

The juxtaposition of masonry pavements against wood claddings and structure is always problematic. Water percolates easily between the pavement and the cladding, and particularly though the areaways, gaining ready access to the cellar through the foundation masonry. Moisture that has not otherwise percolated into the cellar tends to collect at the interface of the masonry and wood, thereby maintaining the wood in a permanently wet condition, and liable to development of fungal and insect attack. No flashings were observed at the interface. While it is possible that concealed flashings may be present, concealing them in this application renders them less effective. Moreover, rainfall splashing up off the hard surfaces saturates the lower courses of shingling regardless.

Beyond the saturated lower shingle courses, it is likely the lower reaches of wall sheathing and framing have been adversely impacted as well. Circumstantial evidence in the arcing of the door threshold between the load bearing doorposts suggest the sill may be deteriorated and compressing (Fig. 36). At such time that these courses of shingles are replaced, sheathing should be removed to reveal the condition of the lower reaches of framing on the three walls abutting the terrace.

The terrace as an historical design feature is important to the overall integrity of the house, and can provide indispensable functionality, even though it will inevitably necessitate more intensive maintenance of the adjoining building walls. For this reason, consideration should be given to installing appropriately detailed flashings to lessen the rates of water infiltration. Other subtle improvements in drainage, particularly within the areaways, could also provide a beneficial effect.

Glazing of each areaway cover is configured as a single light set in an iron frame, and supported on the underside by two intermediate muntins. Iron frames are corroding significantly, and would benefit from passivation and painting (Fig. 37).

The pavement of the terrace is at a significant elevation above the surrounding grade (as much as 19 inches). Because current building and accessibility codes tend to discourage such unprotected edges, replacing the missing balustrade should be considered. The details are likely discernable from the anchor locations and shingle evidence heretofore alluded, and may in fact be similar to the extant balustrade on the west balcony. Any such reinstatement may require historically sympathetic augmentations, as it is likely that the original balustrade dimensions do not meet current code requirements.

R3.2-1 Recommendation: *Remove all vegetation growing in the joints of the terrace paving, reset all heaved brick pavers, and re-grout the joints with a dry sand-lime mix that is dampened after placement.*

R3.2-2 Recommendation: *Repoint all head and bed joints of the perimeter sandstone copings with appropriate sand-lime mix.*

R3.2-3Recommendation: *Remove areaway glazing to access the respective iron frames. Remove loose corrosion, passivate the surfaces, prime with a zinc-rich primer, and paint. Reset the glazing with a sealant that is visually and physically compatible with the paint system employed.*

R3.2-4 Recommendation: *Carefully remove paving from a 1-foot wide zone along the entire length of engagement with the wood framed walls. Inspect the condition of the buried wood sheathing and framing, and replace deteriorated elements with borate-treated materials as required. Reinstall masonry paving incorporating a membrane and a 1-inch air gap between paving and wood elements. Cover open top of the air gap with lead-coated copper counter flashing integrated into the base course of shingles above.*

R3.2-5 Recommendation: *Reconstruct north terrace balustrade, matching profiles and configurations of original west balcony balustrade. Augment with sympathetically designed code-compliant guard and handrails.*

3.3 Chimneys

Two prominent chimneys rise through the main roof on the south side of the ridge. Although of equal height and outwardly identical, the east chimney is of greater depth from south to north, as it provides flues for four fireplaces. The west chimney served only the kitchen range, and the furnace and water heater in the cellar. This difference notwithstanding, the principal roofline of the south elevation nevertheless presents an image of symmetry. In contrast to the use of field stone rubble, the chimney tops are instead rendered in coursed rock-faced granite ashlar. This treatment is employed only above the roofline, as the remaining lengths of both chimneys are of brick. The chimney tops are fitted with corbelled granite copings surmounted by cementitious caps, through which project vitrified tile flue liners. Where chimney stems penetrate the roof, they incorporate sheet lead counter flashings, turned down over separate base flashings that are woven into the roof shingles.

Although close access could not be obtained, the chimney pointing as inspected via binoculars appears in reasonably good condition. Limited surfaces of pointing and stone are however disfigured by ferrous staining, emanating from what appear to be abandoned remnants of a steel wire and nail trellis system (Figs. 38, 39). While the staining is largely visually intrusive, continuing corrosion of the nails will cause mechanical failure of adjacent mortar pointing via the mechanism of ferrous jacking. When viewed from within the attic, it is apparent that leakage along the perimeter flashings has been a chronic problem with both chimneys. These should be addressed when the south slopes of the main gambrel are reroofed.

As it is difficult to perform chimney repairs without risk of damage to the roof from staging and mortar handling, such work would normally be undertaken in conjunction with major reroofing projects. Thus, both chimney tops should be thoroughly inspected, and provided with any required repairs to pointing and flashing at such time as the south main roof is reshingled. This work should include removal of all ferrous trellis remnants, and chemical cleaning of the ferrous staining. Care must be provided in handling of cleaning agents and rinse run-off to avoid transporting the stains to other unintended surfaces. If the historic trellis system is to be reinstated, then stainless steel components should be substituted.

R3.3-1 Recommendation: *When the south slopes of the main gambrel roof are reshingled, document and remove the ferrous trellis system and associated anchors. Inspect and provide repairs to caps and flues as required. Repoint deteriorated masonry joints (presuming approximately 30% of surface area), and point in new lead counter flashings to receive base flashings provided during the reshingling.*

3.4 Roofing and Flashing

At least three different campaigns of three-tab bituminous roofing shingles are evident on the building. The oldest are the gray-green shingles on the south upper and lower gambrel slopes, and on the connected octagonal dormers. More recent are the light green shingles of the south, east, and west verandas, whereas the newest appear to be the dark green shingles of the north gambrel slopes and associated dormers. All three campaigns have incorporated galvanized or aluminum drip edge flashings, however most other sheet metals, except the lead chimney step flashings, are concealed.

Based upon the architectural period and style as well as the characteristics of the framing, sheathing, and trim, the original roofing materials were likely to have been wood shingles. These probably incorporated concealed sheet metal flashings (except for the exposed steps at the chimneys), and made no use of sheet metal drip edges on rakes or eaves. None of the present installations attempts to reproduce historic configurations in material, although a few of the installation details (such as the saddle ridges and the closed valleys) are reminiscent of the wood shingle antecedents.

Main North Elevation Roof

Of the three campaigns, the most recent (the north elevation) appears to have been conducted in response to some rather egregious conditions in the attic finishes; where numerous water stains had appeared around the central shed dormer (Fig. 40), and ceiling plaster had been lost below the upper end of the dormer's east cheek wall. At least two ventilating roof scuttles (the structural framing of which remains above the present easterly dormer) have been abandoned and roofed over (Fig. 41). The roof remains in relatively good condition, and does not appear in need of replacement (Fig. 41).

Veranda Roofs

Although none of the conditions spurring reroofing of the verandas remains in evidence, it is likely that some soffits and sheathing were repaired concurrently, as some of the soffit shingling is missing from the repair sites. Moreover it is possible that all the present wood gutters and fascia, as well as the galvanized conductors, date from this campaign also.

While the west veranda roof remains in relatively good condition, problems are beginning to surface on its counterparts to the south and east. On these, some distinctive cracking patterns have developed, running from bottom to top in straight lines perpendicular to the eaves (Fig. 42). It is possible that these occur over rafter locations, which form corresponding ridges in the roof plane owing to the slight sag in the sheathing spanning between. These may be symptomatic of minor deterioration in the sheathing itself, or of overly long spans between rafters. Some of the cracking systems have opened to an extent allowing the potential of water infiltration, which will adversely impact roof sheathing, framing, and the veranda ceilings below.

All junctures of veranda roofs with main house roofs and walls are potential areas of concern. Such locations are highly vulnerable to water infiltration, and the flashings protecting them are not available for inspection (Fig. 43). When roofing or wall cladding materials are replaced along this interface, efforts should be made to verify the condition of roof and wall framing adjacent, and to remediate deterioration where noted. Particular care should be taken to reintegrate flashings in a manner that subsequent nailing of roofing and cladding materials does not compromise them.

Main South Elevation Roof

The oldest of the campaigns likely saw the abandonment of at least four additional roof scuttles formerly used for lighting, ventilation, and access. The structural framing for two of these is apparent over the easterly bay (Fig. 44). The ceiling frame of a center scuttle near the upper ridge equidistant between the chimneys also survives (Fig. 45). Leakage and plaster loss adjacent have likely prompted its abandonment. The abandoned exterior curb of a fourth scuttle survives near the upper ridge at the westerly end of the roof, although no evidence of it can be discerned in the plastered attic ceiling below.

The main south elevation roof is in poor condition and in critical need of replacement. Granular surfacing on the shingles has weathered substantially, allowing embrittlement and curling from ultraviolet exposure. The curling in particular has accompanied loss of the mastic seal from one course to the next, leaving them liable to intrusion of wind-driven rain (Fig. 46). The heavy layering observable along the eaves of the dormers suggests that these may cover an earlier shingle installation which may be also be hindering proper laying and sealing of the topmost layer.

Numerous areas of long-standing leakage were observed during the survey. The most significant of these are along the dormer valleys. Infiltration along the western-most of these valleys is most likely responsible for the large area of plaster recently lost from southwest second story chamber (Fig. 47). This is substantiated by the high moisture content in the associated lathing and framing (as high as 32%), along with the water stains on surviving plaster surfaces adjacent.

In addition to the prior leakage around the abandoned scuttles, infiltration is likely occurring along both sets of chimney flashings. Significant water stains can be seen in the attic plastered finishes around each of the chimney stems. Of these, leakage along the west face of the east chimney has been the worst (Fig. 48), although the west face of the west chimney is substantially developed as well.

Both loose fill and paper-faced mineral wool thermal insulation were observed in the attic, all in relatively poor condition. These were apparently installed only around the finished spaces, leaving the unfinished areas cold and well ventilated. If augmentation of insulation is considered in the future, care should be taken to first analyze the potential for ice-dam formation on the upper slopes of the gambrel, as this may once again encourage leakage around the north shed dormer. Snow and ice accumulation may also be of concern along the lower north and south eaves of the gambrel. On the north, moisture from snow sitting on the gutter can easily penetrate the interface between the roof and the fascia (and has apparently done so beneath the easterly dormer). On the south, east, and west, snow accumulating at the juncture of the veranda roof with the gambrel or wall can also readily contribute infiltrating moisture. This has caused substantial deterioration of wall shingles immediately adjacent.

While wood shingles would be the most historically appropriate material for reroofing, their expense might be considered prohibitive and their longevity would not be significantly greater than modern bituminous shingles, unless they were kept stained or painted. Modern bituminous shingles are presently available in appropriate color ranges (mottled browns or grays) and in laminated configurations that might be considered suggestive of the texture of wood shingles. Some historic commissions disapprove of these on the notion that standard three-tab shingles are a more honest expression of the material from which they are made. It should be kept in mind however that three-tab shingles were originally marketed to evoke the appearance of slates and tiles, and may be no more honest in this regard than the laminated varieties.

R3.4-1 Recommendation: *Remove existing and replace shingles on the south upper and lower slopes of the main gambrel roof, also replacing in-kind any deteriorated roof sheathing encountered. Incorporate new lead coated copper flashings at intermediate ridges and chimney bases, and in the apron zone along the veranda roof interfaces. Incorporate wood shingle drips along eaves and rakes. Underlay all flashings, as well as all ridges, closed valleys, eaves, and rakes, with bituminous polyethylene membrane.*

R3.4-2 Recommendation: *Remove existing and replace shingles on the south, east, and west veranda roofs, also replacing in-kind any deteriorated roof sheathing encountered. Incorporate new lead coated copper base and apron flashings at junctures with adjacent roof and wall planes. Underlay all flashings, as well as all ridges and eaves with bituminous polyethylene membrane.*

3.5 Gutters and Conductors

Nearly all of the original wood gutters and sheet metal conductors on the Hildreth House have been abandoned or replaced. Modern wood gutters are present along all eaves of the south, east, and west verandas, and along all first story gambrel eaves of the north elevation. Most of the associated fascias have similarly been replaced. In addition, modern wood gutters have been installed on the eaves and returns of the attic shed dormer on the north elevation, as well as on the attic eaves of the adjacent gambrel.

Gutters

Historic gutters on the Hildreth House displayed the deeply cut ogee profile popular at the time, and in conjunction with the bed molding and fascia below, appeared as an architectural cornice. This allowed easy integration with adjoining elements of running trim such as cornice returns and rakes; most of which do still survive on the house. One small segment of original gutter survives as well, at the juncture of the west veranda and the west balcony. While its westerly end has been replaced, the easternmost segment has been abandoned in place and boxed over, leaving the lead drop to the former conductor still intact (Fig. 49).

Although the modern gutters are installed much in the manner as their predecessors, are neatly fitted, and have similar relationships to their respective bed moldings and fasciae; their profiles do not match the originals. The shallower ogee form of modern stock wood gutters creates awkward miters at corners where they must interface with original cornice returns and rakes. Examples of these can be seen at the east and west ends of the north terrace, where surviving historic cornices and rakes engage the gutters at the two respective corners (Fig. 50).

Outside of these installation difficulties, the modern wood gutters are all in good condition, and do not warrant any alteration at present. Joints between sections are tarred and flashed with sheet metal within the troughs. No significant leakage was observed, even if some may overflow during particularly heavy rains. The long-term viability of the modern gutters appears to be threatened only by their want of painting and caulking. Future replacements should consider reinstating the historic profiles, if funding permits.

A short anomalous reach of galvanized half-round gutter also survives the most recent roofing campaign. This was installed along the eaves of the westerly dormer on the north elevation. As there is no discernable evidence of prior wood gutters on these dormers, the sheet metal gutter was likely an afterthought to address localized problems. While gutters might in theory benefit these dormers by intercepting the valley discharge above, there is no reasonable way to handle the discharge of the gutters themselves. On the north elevation's easterly dormer, no gutter is employed, and the valley discharge pattern is seen via the stains running down the roof shingles along the sides of the dormer. Corresponding deterioration of the fascia above the gutter is also apparent. The westerly dormer shows similar deterioration of the fascia at corresponding locations, however the staining down the shingles (exacerbated by corrosion of the gutter) is much worse (Fig. 51).

Conductors

In contrast to the uncorrugated sheet metal or wood conductors more typical of the era, all conductors at present are 3-inch round corrugated galvanized steel, dating to the installation of the modern wood gutters. Conductors are generally situated at the historic locations, in part to take advantage of previously existing conductor drains. However all drains have been abandoned save for three along the north elevation, and most conductors discharge to daylight at the base of the respective foundation walls. Some of the discharge elbows are set so high off the ground that adjacent foundation masonry becomes saturated by splash-back (Fig. 52).

Conductors are generally anchored to the adjacent structure via pintle-type hinged clasps at two or three locations, depending on their length. Where they drain veranda roofs, they are anchored at the level of the veranda parapet caps, and above the first course of wall shingles. While the anchorage sites selected afforded the shortest required pintles (and were probably the historic choices as well), the veranda parapet caps have suffered greatly at the sites where the pintles have been driven (Fig. 53). Otherwise, the conductors appear in serviceable condition except for localized corrosion developing where galvanizing has been eroded.

While minor replacements of sections and elbows is necessary, there is no need to perform wholesale removals to more closely replicate the originals. On the other hand, painting of the conductors would not only lengthen their service life, but also present a more historically appropriate appearance.

R3.5-1 Recommendation: *Replace in kind any conductor sections that are heavily corroded or perforated. Where conductor drains have been reinstated, extend conductors to engage them. Configure conductor connection with drain to enable easy removal of conductor for cleaning. Where masonry surface troughs have been installed, extend lengths of respective conductors so that discharge elbows lay directly in them.*

R3.5-2 Recommendation: *Passivate existing corrosion, prime with zinc-rich primer, and paint conductors the selected wall shingle color.*

R3.5-3 Recommendation: *Remove all conductor hangers from veranda wall caps and relocate them to the first course of shingles below the caps. Custom-length pintles or discretely placed blocking may be required.*

R3.5-3 Recommendation: *Remove galvanized half-round gutter from north elevation west dormer, and seal all holes left by removed anchorages.*

3.6 Rakes, Eaves, Soffits, and Miscellaneous Trim

With the exception of friezes and bed moldings replaced in conjunction with the modern wood gutters, most of the original trim appears to have survived intact. Rakes employed a classical crown, frieze, denticulated soffit, and bed. Cornices along the eaves were simpler, omitting the dentils, but were otherwise designed to engage the crown of the rakes. In contrast to the slightly projecting rake soffits, the eaves project strongly, and the eave soffits are shingled. Butts of these are oriented to the outside to present distinct shadow lines, and shingle courses are mitered at the outside corners, except on the north elevation dormers.

Shingled soffits are not employed throughout however. Adjacent to the attic shed dormer on the north elevation (which has shingled soffits), short segments of gambrel roof eaves on either side employ open soffits and exposed ornamented rafter tails. Also, the soffit beneath the northwest balcony is finished with matched and beaded boards, in the manner of the veranda ceilings. The heavy laminated wood brackets below likely provide supplemental support to an otherwise cantilevered deck.

The condition of rake, eave, and soffit trim varies with location. Although no significant losses are imminent, those materials higher on the respective elevations tend to be more in need of attention than those nearer the ground. Consistent with the increased degree of exposure to which these are subjected, most of the observed problems have to do with deteriorated nailings, flashings, and caulking allowing joints to open and water to penetrate (Fig. 54). It is likely that upon close inspection of the more exposed elements, some need for epoxy consolidation or filling of deteriorated wood will be required, particularly at the butted joints of the members. On the other hand, where deterioration is noted in unprofiled elements that can be easily and accurately replicated, then direct replacement of deteriorated reaches is would be acceptable. Note that all pieced-in repairs should utilize the same species and grain orientation as the original element being repaired. Also, all new wood materials should be treated with a borate solution and primed (except at epoxy sites) prior to installation.

Even though they are in protected locations, several localized losses of soffit shingles were observed. These are mostly at the mitered corners, where individual pieces need to be cut so small that they split at their nailings. At the southeast corner of the veranda, soffit shingles previously removed to enable reinforcement of sheathing have never been reinstalled (Fig. 55).

Other exceptions to the exposure rule are those elements lower on the building that are in the path of significant water run-off. Chief among these are the two stretches of fascia above the gutters at the first story eaves of the north elevation. These broad fasciae are saturated from snow retention in the gutters over the winter, and are subjected to heavy quantities of water discharging from the dormer valleys. Their present condition allows water access to the rafter ends and soffit framing (Fig. 56).

It is probably not viable to retain these as painted wood elements. Although specific evidence is lacking, a typical way to treat such and element historically would have been to clad it with flat-locked seam sheet metal, extending into the gutter to form a gutter lining as well. The cladding would have typically been painted to match the trim. When these are removed for replacement, exposed roof and soffit framing should be inspected and repaired as required.

All trim elements are in urgent need of caulking and painting. Having gone without for so long, many are showing heavy weathering via exposure to ultraviolet light and wind abrasion. Lack of paint also encourages greater shrinking and swelling cycles in response to changing humidity and moisture, which in turn opens joints and loosens fastenings. Ferrous nails are similarly more prone to corrosion and failure in unpainted wood.

R3.6-1 Recommendation: *Reinstall missing soffit shingles and replace in-kind any damaged shingles*

R3.6-2 Recommendation: *Replace in-kind the fascias above the north elevation gutters on both the east and west wings. Clad with flat lock-seam lead coated copper, extending under the bottom course of roof shingles. Extend cladding into troughs of respective gutters and cleat to outer lips to form a lining. Prime the cladding and paint the selected trim color.*

R3.6-3 Recommendation: *Execute epoxy or spliced infill patching of south elevation eave trim, paying particular attention to the cornices above the octagonal bays. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.*

R3.6-4 Recommendation: *Execute minor epoxy patching of east elevation rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.*

R3.6-5 Recommendation: *Execute minor epoxy patching of west elevation rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.*

R3.6-6 Recommendation: *Execute minor epoxy patching of north elevation eave and rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.*

3.7 Wall Cladding

In keeping with the characteristics of its genre, exterior wall surfaces of the Hildreth House are clad with sawn wood shingles. These are 16 inches in length and range in width from 2 inches to 9½ inches. Although initially furnished with 5/16-inch squared butts, many have since weathered to a much thinner dimension. The exposure of each course is consistently 5 inches from top to bottom of the respective wall planes, and the lower 3 courses are kicked outwards approximately 3 inches to shed water from the base of the wall, eliminating the need for a water table. Corners are formed by neatly butting edges to flush-trimmed back surfaces of adjoining members, alternating the direction of the joint with each course.

Because wood wall shingles maintained in a painted condition will last many decades, substantial areas of original shingling survive on the Hildreth House, still affixed with their machine-cut iron nails. Unfortunately, most of these are now in need of replacement. Of those already replaced in previous repair campaigns, with the exception of the new wheelchair ramp, the differences between the repair materials and the originals are not apparent to casual observation.

Shingles have suffered the most where they are subjected to prolonged or excessive exposure moisture, or to direct sunlight. Locations most prone to moisture-induced deterioration include courses near the ground (in contact with snow banks) and adjacent to outside corners, particularly as the joints begin to open. Courses abutting veranda roofs and open paved terraces also suffer from snow accumulation and rainwater splash back (Figs. 20, 43). Wall areas subjected to significant water run-off, such as non-guttered eaves or valleys, are also at risk. Moreover, areas in constant contact with shrubbery or other vegetation may deteriorate more quickly, if they are maintained in a damp condition by virtue of this contact. Conversely, wall areas protected by veranda roofs or broad overhangs will be much less affected.

Ultraviolet radiation from the sun plays a significant role in the deterioration of organic materials (Fig. 57). Unpainted shingles on walls having southerly and westerly exposures in particular, and not otherwise protected by overhangs, are highly vulnerable. As lignin in the wood cell walls decomposes, the shingles begin to curl, loosening their fastenings, and absorbing greater quantities of moisture. The effect is also present on the east, and to a slightly lesser extent on the west. Again, wall areas that are protected by veranda roofs and broad overhangs are less at risk. Ultraviolet degradation is generally insignificant on northerly facing walls, although these exposures frequently suffer more moisture-induced deterioration for lack of sufficient sunlight to dry the shingles between rainfalls.

Wall shingling and sheathing have also been compromised by the introduction of blown-in thermal insulation. The process necessitates shingle removal and boring of 2-inch holes through the sheathing between each wall stud in at least two courses on each elevation. Afterwards, sheathing itself is rarely patched, and new covering shingles are often face-nailed rather than blind-nailed (Fig. 58).

Specific areas in need of reshingling on the Hildreth House are indicated on the drawings, and generally include the following in order of urgency:

a) South Elevation:

All south veranda outside wall surfaces below the parapet cap, as well as all courses comprising the second story dormers (Dwg. R-1).

b) East Elevation:

All east veranda outside wall surfaces below the parapet cap, as well as all areas above the east veranda roof (Dwg. R-2).

c) West Elevation:

All west veranda outside wall surfaces below the parapet cap, as well as all areas above the veranda roof and balcony deck, and approximately 20% of shingles below the balcony deck. The west outside wall of the south veranda is in marginal condition and might be considered for replacement as well (Dwg. R-4).

d) North Elevation:

Approximately 5% of shingles on the north outside wall of the east veranda, plus miscellaneous shingles around the electrical meter and the lower outside west corner of the east wing, and approximately 5% of shingles on the northerly face of the west wing. Also in need of replacement are the bottom 3 shingle courses of the 3 wall surfaces adjoining the paved terrace and 10% of shingles throughout these respective surfaces (Dwg. R-3).

e) Miscellaneous Locations:

Individual shingles at outside corners where joints have opened or shingles have split due to inappropriate edge nailing (Fig. 59).

As it is no longer possible to get adequate quality materials in the original species, replacement shingles should be of red cedar, *certi-grade blue label*, resquared and rebutted. All replacements should match the visual characteristics of the historic materials as closely as possible, including length, butt thickness, surface texture, range of widths, exposure and installation details. The latter include matching existing coursings, flares, and rendering of corner joints.

To maximize service life, new shingles should be pre-dipped or sprayed with borate solution and allowed to dry; then pre-dipped in stain prior to installation. Fastening should be with stainless steel nails and not staples. During installation, any exposed wall sheathing should be inspected for deterioration, and repaired or replaced in-kind as required. Where sheathing is deteriorated, the condition of underlying framing should be verified as well. Sheathing should be overlaid with a permeable wind-barrier to prevent entrapment of moisture. Any deteriorated wall flashings, such as at belts, window heads, window aprons, or roof-wall junctures, should be replaced in-kind. The preferred metal for replacement of concealed flashings is lead-coated copper, unless galvanically incompatible with existing flashings with which it contacts.

R3.7-1 Recommendation: *Remove existing and reshingle all south veranda outside wall surfaces below the parapet cap, as well as all wall surfaces comprising the second story dormers.*

R3.7-2 Recommendation: *Remove existing and reshingle all east veranda outside wall surfaces below the parapet cap, as well as all areas above the east veranda roof.*

R3.7-3 Recommendation: *Remove and reshingle all west veranda outside wall surfaces below the parapet cap, as well as all areas above the veranda roof and balcony deck, and approximately 20% of shingles below the balcony deck. Also remove and reshingle the west outside wall of the south veranda.*

R3.7-4 Recommendation: *Remove and reshingle approximately 5% of the north outside wall of the east veranda, plus miscellaneous shingles around the electrical meter and the lower outside west corner of the east wing, and approximately 5% of the northerly face of the west wing. Also remove and reshingle 10% of the three respective wall surfaces adjoining the paved terrace. In addition, remove and reshingle the bottom 3 courses of the same three wall surfaces, incorporating new hidden lead-coated copper counter flashings to cover air-gaps introduced during restoration of the north terrace.*

R3.7-5 Recommendation: *Remove and replace individual shingles at outside corners where joints have opened or shingles have split due to inappropriate edge nailing.*

3.8 Verandas and Balconies

The south and east elevations of the Hildreth House are dominated by the broad veranda wrapping around the house. A second story balcony adjoins a smaller veranda on the west. The verandas are constructed and detailed in much the same manner; the chief difference being that the cellar extends beneath the west veranda while the south and east are built over a crawlspace.

South and East Verandas

Floor framing of the south and east verandas originally consisted of 2-inch by 10-inch joists spaced at 16 inches on center, running parallel with the respective primary walls of the house. Many at the westerly end of the south veranda have been replaced with modern nominal 2 x 10 members. Joists span roughly 12 feet between primary girts that in turn span from the respective house wall sills to the outer veranda wall sills. On these are laid 1-inch by 3½-inch face-nailed painted softwood flooring. This material is square-edged rather than tongue and grooved, with slight spacing between boards that affords a means of drainage. Ceilings are beaded and painted matchboard, of 3⅜-inch by ⅞-inch stock. Parapet walls are shingled inside and outside, and topped by simple plank caps, both edges of which are nosed and underlain with bed moldings. Posts rise through the caps approximately every 12 feet, supporting an entablature and in turn the veranda roof framing. The posts are boxed with built-up trim to achieve coved corners and flaring on two opposing sides to engage the entablatures, which in turn continue the established profiles.

Floor framing at the easterly end of the south veranda has been recently replaced, probably in conjunction with construction of the wheelchair ramp. The newer framing largely replicates the old in nominal joist size and location, although incorporates steel joist hangars in accordance with current practice. Although no significant areas of decay or infestation could be observed from beneath, a soft spot in the flooring in the southeast corner of the south veranda should be further investigated (Fig. 60). The location has poor drainage, and several of the shorter floorboards in the corner that are not well seated should be carefully removed to reveal the condition of the top of the main diagonal beam and the joists that frame into it.

Wood moisture content of the south and east veranda floor framing averaged 14%-16%. This is predictably higher than most of the painted trim due to the chronically high relative humidity observed in the crawlspace beneath.

The thickness of the veranda stone foundation walls prevents direct examination of the sills and girt ends, which are most likely to be at risk. These should be examined by selective lifting of sheathing when the outer faces of the veranda parapet walls are next reshingled. Moreover, there is circumstantial evidence to suggest that the veranda sills may suffer some decay. Many of the lengths of parapet cap appear slightly arched in elevation, bowing downwards towards each post location (Fig. 61). This might occur because the roof loads transmitted through the posts are significantly greater than the parapet wall loads between, so a deteriorated sill may compress at these locations. Finally, it should be kept in mind that the veranda floors, although well framed, are still residential in design. If current use of the structure includes large gatherings on the verandas, then a structural load analysis should be commissioned to determine whether additional reinforcement is warranted. Adding any needed supports in the crawlspace beneath would be a simple matter.

The verandas' boxed entablatures are largely intact, although many of the boxed posts have suffered woodpecker damage. In fact, birds were observed at work on more than one occasion. The damage is unusual not only in its extensiveness, but also that it is prevalent in areas that are so readily accessible from the ground. Several of the post facings show holes as much as 1½ inch in diameter, which are sufficient for nesting access. While most posts show no more than two developed holes, numerous others in the beginning stages are also evident (Fig. 62). Water may find ready entry through the holes, as well as through the numerous joints of the built-up trim, which are no longer tight. The attractiveness of these hollow elements to birds would likely have been less had the painted coatings been more intact.

Veranda parapet caps have been the element of choice in which to drive all manner of miscellaneous fasteners, most notably the conductor hangers, as well as large screws apparently for supporting wire trellises. The concentrations of these in small areas (particularly near the joints beneath the posts) have caused mechanical damage, through which water has subsequently entered and facilitated decay (Fig. 63).

More generalized problems with the trim occur throughout all the verandas. These include opening of joints due to deterioration of fastenings and failure of caulks, and also splits near end joints due to ill-planned placement of hardware (Fig. 64). Most of these however are readily addressable with a combination of pieced-in repairs and epoxy fills and consolidants. Note that any pieced-in repairs should utilize the same species and grain orientation as the original element being repaired. Also, all new wood materials should be treated with a borate solution and primed (except at epoxy sites) prior to installation. All veranda trim is in urgent need of caulking and painting.

Finally it should be noted that the storage of propane-fired grills on the east veranda presents a fire hazard to the structure. Ideally, propane tanks should be stored off the premises and brought to the site when needed. Because of the high flammability of all surrounding building materials, these grills should not be operated while on the veranda, but rather should taken down onto the driveway prior to use.

West Veranda

Although outwardly similar in configuration and condition to the south and east verandas, the west veranda differs slightly in that its deck also serves to roof the portion of cellar extending beneath. The demands of waterproofing are met by a painted canvas membrane stretched over the $3\frac{3}{8}$-inch by $\frac{7}{8}$-inch floorboards, and turned up and tacked at each adjoining wall surface. A zinc apron flashing is visible beneath the service door threshold, although it is unknown whether any sheet metal extends beneath the canvas membrane (Fig. 65).

The only available means of floor surface drainage (discharging all runoff over the stairway) is compromised by a wood frame that had accommodated a partial screened enclosure of this veranda. This crosses the floor with a sill for a screen panel aligned with a threshold for a screened door, and meets the west wall of the house between the service door and the icebox door (Fig. 66). The frame interrupts the present canvas membrane, which turns up and is tacked to the sill along both inner and outer faces, and is engaged by a copper cladding over the threshold. Any water accumulating on the portion of floor north of this is effectively prevented from draining.

Whether the membrane and drainage details are currently allowing water infiltration to the cellar is unknown. The underside of the veranda sub flooring, as viewed from the cellar, displays numerous water stains (Fig. 67). However the moisture contents of the sub flooring and associated framing are no higher than those measured elsewhere in the cellar. It is possible that the broad roof overhangs prevent exposure of the veranda floor to any significant rainfall. Accumulation of wind-driven snow should nevertheless remain a significant concern, as its melt water will remain entrapped. The floor should be kept shoveled in the winter, and the underside should be monitored from the cellar during heavy rains or snow melts to verify whether infiltration is occurring.

West Balcony

A second story balcony abuts the west veranda roof along its northerly edge. As viewed from below, the balcony is comprised of cantilevered floor joists, augmented by large supporting brackets, and finished with a matchboard ceiling and trim. Granular-surfaced roll roofing on board sheathing protects this assembly from the top, although it is scarcely visible through the overlying balcony floor decking and balustrade superstructure. Sitting directly atop the roll roofing, the floor decking and associated sleepers or joists are unrelated to the structure of the balcony itself. Deck boards are spaced to allow drainage to the roll roofing membrane, which in turn directs runoff to the perimeter gutters. Attached to the balustrade is a light wood frame that also engages the west wall behind. This apparently was added to support a seasonal canvas awning, which has been left stored in the attic in recent years.

Lacking the protection of a permanent roof, the highly exposed floor decking and balustrade are both in poor condition (Figs. 68, 69). Fastenings have failed, joints are opened to weather, and numerous elements have suffered heavily from fungal attack. Although railings and individual balusters are salvageable for re-use, the floor decking (including sleepers), awning frame, and balustrade corner posts are not. All these assemblies should be carefully documented, and the deck and balustrade reconstructed, incorporating as many salvaged elements as possible. Wood materials should be treated with borate preservatives and primed on all surfaces prior to reassembly, and the finished work should be kept well painted.

R3.8-1 Recommendation: *Create scuppers through the screen frame sill at the floor of the west veranda to allow drainage of the northerly portion. Scuppers should be flashed with copper, which is in turn sealed to the respective canvas membranes on either side of the sill.*

R3.8-2 Recommendation: *Execute epoxy or spliced infill patching of veranda parapet caps and bed moldings, paying particular attention to the end joints at the respective posts. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.*

R3.8-3 Recommendation: *Execute epoxy or spliced infill patching of veranda post and entablature facings. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.*

R3.8-4 Recommendation: *Renail all failed veranda ceiling anchorages. Prepare, prime, and paint selected trim color.*

R3.8-5 Recommendation: *Carefully remove flooring at southeast corner of south veranda to inspect condition of framing. Augment support as required and reinstall flooring. Prepare, prime, and paint all veranda floors with a gray deck enamel.*

R3.8-6 Recommendation: *Document and carefully remove decking, balustrade, and awning frame from west balcony. Replace roll roofing with new to match existing, complete with bituminous polyethylene underlayment and lead coated copper flashings. Install new balcony sleepers and decking matching original configurations. Reproduce deteriorated balustrade and awning frame elements. Preservative treat and prime all reproduction and remaining original wood balustrade and awning frame elements, and reinstall. Paint completed work with selected trim color.*

3.9 Exterior Stairs and Ramps

Four sets of exterior stairs once provided access to the verandas and to two entries on the north elevation. Of these, three remain, although all have since been rebuilt.

The main front stair accessing the south veranda employs two risers and sectional treads, with minimal nosings and no trim. The stair is carried by five stringers, all landing on a concrete pad. Three pairs of 4 x 4 nominal wood posts rise through the treads, and support short sections of modern steel grab bars, fashioned as railings. The easterly lower post is missing, as is its associated railing (Fig. 70). While the stair is in serviceable condition, it is visually incompatible and does not meet current ADA requirements. It is also in need of painting.

At the west end of the south elevation, another wood stair rises from the lawn to the west veranda. Not on a main access path, it sees little use. Although also recently rebuilt, this stair appears more visually compatible with the historic setting, in that the nosing of the treads projects adequately and is underlain with a bed molding, and the ends are closed with a framed lattice. The most obvious concession to modern practice is the use of sectional 2 x 4 nominal treads with drainage separation between the individual pieces. The stair is carried on four stringers, which land on various stones set in the grade.

Having been reconstructed with pressure treated framing, the west veranda stair remains in good condition, although the lower ends of the stringers may be at future risk of fungal attack due to their close proximity with the earth. Moreover, water from an adjacent conductor eroding the soil beneath may eventually compromise the support for the stringer ends (Fig. 71). Since the stair has no railing, it cannot qualify as one of the required egresses, even though the 7-inch risers and 13-inch treads are appropriately proportioned. However since it is effectively situated at the base of the service stair, consideration should be given to developing it as such.

On the north elevation, exterior doorways serve the east and west wings respectively, although only the easterly of these two is still in use. Its stair has been rebuilt with stock modern framing and decking materials, and left unpainted to weather. A small landing at the doorway is augmented with a three-riser flight descending to the lawn on the north (Fig. 72). Four stringers carry the stair. While a pair of cylindrical concrete piers carries the landing, the lower ends of the stringers are buried in the ground, as is half the lowermost riser. Although this stair is situated to provide a secondary egress from the main interior stairway, its lack of railings again disqualifies it as a formal exit way. Because the stair is visually incompatible with the historic setting, and in marginal condition due to its construction details and lack of finishes, consideration should be given to rebuilding it as a legitimate exit way. An appropriate reconstruction could likely make use of the existing concrete piers.

The stair formerly serving the north exterior doorway on the west wing is currently missing (Fig. 73). Because this door is adjacent to the one accessible toilet facility, and because the only other egress from the toilet is through the part of the house most at-risk as a fire source (the kitchen), consideration should be given to constructing a new stair and reopening this door as a legitimate exit way.

A ramp has recently been added to the south elevation, providing wheelchair access through the dining room doorway off the south veranda. Although the outer surfaces have been clad with wood shingles, the structure's bulk and detailing render it incompatible with the historic setting of the Hildreth House's principal elevation. The breadth of the wood-framed ramp is carried on five 2 x 8 nominal stringers, which in turn are supported by a series of cylindrical concrete pier footings. Decking is of spaced 1-inch by 3½-inch boards laid perpendicular to the direction of travel. The wood framed parapet is clad on the interior with batten-seamed MDO plywood, and on the exterior with wood shingles. The parapet is topped with a wood plank cap reminiscent of the veranda parapet caps, however the bed moldings are omitted.

In spite of its relatively recent origin, elements of the ramp structure are rapidly deteriorating. Splits and checks have developed in the parapet caps and some of the broader trim boards. Cross-joints and miters have opened in the caps at the intermediate landing, freely admitting water to the wall cavity (Fig. 74). Wood moisture contents in this location run as high as 30%, in contrast to an average of 11% along intact sections of the caps. Ends of the decking boards, as well as the bases of the adjacent parapet walls, are damp and supporting heavy algae growths (Fig. 75). As maintenance needs for a complex unroofed wood structure are inevitably intensive, these types problems are to be expected, given the detailing that was employed. Because the need for replacement of parapet caps and other trim elements is imminent, consideration should be given to reconfiguring specific ramp details in a manner that will be more visually compatible with the historic setting, and at least slightly less maintenance-intensive.

All exterior stairs and ramps at the Hildreth House are highly vulnerable to accelerated deterioration due to their exposures (none are protected by roofs) and their proximity to grade. Any new structural lumber should be pressure treated, and structure should be supported in a manner as to avoid ground contact. Wood elements exposed to view should be treated with a borate solution and primed on all surfaces prior to installation. Following installation, wood trim elements should be painted with at least two coats of alkyd paint, and treads painted with at least two coats of deck enamel. Stains are appropriate for use on wall shingles only. They are inadequate for all other stair and ramp elements.

R3.9-1 Recommendation: *Remove existing and reconstruct new code-compliant south veranda stair, detailed to be visually compatible with the historic setting.*

R3.9-2 Recommendation: *Replace missing stair formerly serving the north elevation west wing doorway with new code-compliant stair, detailed to be visually compatible with the historic setting.*

R3.9-3 Recommendation: *Remove existing and reconstruct new code-compliant stair to serve the north elevation east wing doorway, utilizing existing concrete footings.*

R3.9-4 Recommendation: *Remove deteriorated ramp parapet caps, and alter ramp wall height to match elevation of veranda walls. Install wood shingle cladding in lieu of MDO plywood on interior faces of ramp walls. Install new plank caps with reconfigured profile and butt joints, and new bed moldings beneath. Install new pipe rail guards at same elevation as veranda guards. Pre-treat all new wood elements with borate solution and full priming. Caulk and paint all trim elements with at least two coats of selected trim paint, and apply at least two coats of stain to all shingles.*

R3.9-5 Recommendation: *Add code-compliant railings to west veranda stair, detailed to be visually compatible with the historic setting.*

3.10 Doors, Windows, and Blinds

Typical of its genre, the Hildreth House displays a wide variety of door and window configurations, incorporating numerous sizes, shapes, and proportions. There are no fewer than 99 individual surviving exterior sashes, including double-hung, casement, fixed, pivot, and lattice types. Many of these were fitted with exterior blinds. Exterior doorways are also numerous and varied, incorporating 12 individual door leafs. None of these numbers includes interior or exterior storms or screens.

Doors and windows have retained a high level of historical integrity, although the blinds less so. Only two sashes are modern units. A few sashes and a door are missing or have since been blocked. Long absent roof windows and scuttles have not been included in this survey.

Relative to the age of the house, windows and doors remain in remarkably good condition. The state of preservation of any given sash or door tends to be directly related to its position on the house; that is the extent of weathering to which it has been subjected. As with the trim previously noted, windows and doors in locations protected from moisture infiltration and ultraviolet exposure have generally fared better.

Most windows and doors have recently enjoyed the added protection of exterior aluminum combination storm and screen units. These are generally applied to all first and second story windows (except the oval fan lights) and to all functioning first and second story doors. Where sash are not operable, fixed aluminum framed storm panels have been installed. The degree of protection they afford is apparent in comparing the difference in condition between the second story and third story windows, the latter of which have gone without storms. However, the appearance of these storm units, and their impact on the historic integrity of the house, is unfortunate. Particularly jarring are the storm doors, with their broad aluminum lower panels.

It is unrealistic in the context of this building to propose wholesale removal of the storm units, particularly in light of both their thermal as well as their protective benefits. However, the simple measure of painting them (sash and frames alike) the color of the trim will substantially diminish their prominence. Storm doors themselves should be painted the color of the respective doors that they cover, or preferably should be replaced with all glazed versions. Attic windows currently lacking storms should be fitted with custom aluminum-framed panels configured to allow future use of the casements for ventilating.

Windows

The most common problem noted in window sashes is broken sash cords, followed by deterioration of glazing compound and broken lights. A few of the more exposed sashes are showing deterioration in their bottom rail corner joints, although none to the extent that might cause slippage of the glass. The sills and lower ends of exterior casings in some of the second and third story windows are showing signs of checking and decay in their weathering surfaces (Fig. 76). None of the wood deterioration noted is particularly remarkable, and virtually all is readily repairable using standard epoxy consolidants and fills, and occasional pieced-in repairs. Note that all pieced-in repairs should utilize the same species and grain orientation as the original element being repaired. Also, all new wood materials should be treated with a borate solution and primed (except at epoxy sites) prior to installation.

One pair of modern sashes (in conjunction with a new frame and casings) has been installed on the first story south elevation. These utilize double-glazed undivided lights with snap-in muntins, which are very poor facsimiles of the originals. With respect to the historic windows, it is generally not possible to install insulated glazing into sashes having these profiles and configurations, without seriously compromising their integrity. Because virtually all the windows already have the thermal protection of storms, replacing sashes with units having insulated glazing is not warranted. Moreover, owing to their reasonably good condition and ready reparability, none of the surviving sashes should be considered for replacement at this time.

Blinds

The house originally incorporated a variety of exterior louvered blinds. These were provided on virtually all first, second, and attic story windows. While not always a feature of the shingle style genre, blinds played an important role in the Hildreth House not only in their ability to regulate light, rain, and airflow through open windows, but as façade articulating elements as well. The variety of window types and arrangements demanded an unusual creativity in configuring the blinds to work in all the applications. Groupings of double-hung and casement windows provided the greatest challenges, often requiring employment of bi-fold panels to maintain operability.

Exterior blinds on this structure are generally in poor condition and many are missing altogether. The range of problems includes broken and missing louvers, deteriorated stile/rail joints, and open checks associated with heavy weathering and lack of paint (Fig. 77). Because they are such an historically prominent and character-defining feature of this structure, every effort should be made to preserve the blinds that remain. Moreover, consideration should be given to eventual reproduction of missing units as well. In light of other priorities however, the likelihood of devoting resources to these in the near future appears low. Therefore in order to preserve what remains, all blinds that are currently incomplete or in need of repair should be labeled as to specific window of origin and removed to the easterly room of the attic for safekeeping. Blinds that are still viable for service should remain in place, and should be prepared and painted as soon as possible.

Doors

As with the windows, doorways incorporate numerous sizes, shapes, and proportions. These range from single-leaf paneled with semicircular or rectangular arrays of lights to double-leaf fully glazed French doors. The door providing a wheelchair entrance into the dining room is modern, although vaguely reminiscent of the historical front door in its use of a semicircular array of lights.

Excepting for miscellaneous broken lights and occasional instances of deteriorated glazing compound, most doors are in good condition. One potentially problematic door is that accessing the crawlspace beneath the northeast wing. It is blocked off with plywood and unavailable for inspection. The cellar door on the west elevation needs substantial work. The lower rail and stiles, as well as the threshold and lower jambs of the frame are heavily deteriorated from ground contact (Fig. 78). The door and frame elements are treatable using epoxy consolidants and fills, in conjunction with pieced-in repairs. Again, note that all pieced-in repairs should utilize the same species and grain orientation as the original element being repaired. Also, all new wood materials should be treated with a borate solution and primed (except at epoxy sites) prior to installation.

R3.10-1 Recommendation: *Document locations and remove all surviving exterior window blinds, including any fragments thereof as well as those lying loose around the site. Store in attic for future repair.*

R3.10-2 Recommendation: *Remove window sashes having broken lights or deteriorated joints (approximately 26 units) and execute epoxy or pieced-in repairs and reglazing as required. Prime and paint sash prior to reinstalling.*

R3.10-3 Recommendation: *Remove exterior storm units and execute epoxy repairs to deteriorated casings and sills of second and attic story windows on the south, east, and west elevations (approximately 14 units). Prime and paint selected trim color, and reinstall storm units.*

R3.10-4 Recommendation: *Remove exterior storm units and execute epoxy and pieced-in repairs to deteriorated casings and sills of first, second, and third story windows on the north elevation (approximately 6 units) south, east, and west elevations. Prime and paint selected trim color, and reinstall storm units.*

R3.10-5 Recommendation: *Prepare, prime and paint all sashes, doors, storm units, and trim (not otherwise painted in the course of repairs) with respective selected trim, sash, and door colors.*

R3.10-6 Recommendation: *Fabricate and install new aluminum storm panels for attic story windows and west elevation oval window, configured in a manner to allow operation of the sash for ventilation. Remove and store existing wood storm panel covering oval window. Prime and paint new units the selected trim color.*

R3.10-7 Recommendation: *Remove existing west elevation cellar door and execute epoxy or pieced-in repairs as required. Prime and paint with selected door leaf color prior to reinstalling. Also execute epoxy or pieced-in repairs to lower frames and sill. Prime and paint selected trim color.*

R3.10-8 Recommendation: *Remove existing cellar and veranda crawlspace sash and panels where frames are deteriorated. Execute epoxy or pieced-in repairs to frames, and reinstate appropriate staff beads where missing. Prime and paint frames the selected trim color. Repair existing east veranda lattice with in-kind materials fabricate new appropriately detailed lattice to replace that missing from the west end of the south veranda. Execute epoxy or pieced-in repairs and reglazing as required on all cellar sashes, and furnish new to match existing where missing. Prime and paint sashes prior to reinstalling. Repair, prime, paint, and reinstall wood security panels over cellar sash if required, or fabricate and install new glazed aluminum storm panels set recessed into respective frames, and painted the selected trim color.*

R3.10-9 Recommendation: *Remove for inspection the plywood covering of the crawlspace access door off the north terrace. Execute epoxy or pieced-in repairs to door if extant, or replace with new beaded matchboard and batten door if original is missing. Treat all new materials with borate solution, and prime and paint selected door leaf color.*

R3.10-10 Recommendation: *Execute epoxy or pieced-in repairs to substantially intact window blinds as required (approximately 22 panels). Prime and paint selected blind color prior to reinstalling. Retain all non-viable units in attic storage for future reference and repair stock.*

R3.10-11 Recommendation: *Remove existing aluminum storm doors and replace with new units comprised of single large glazed area with minimum enframement. Obtain new units in factory colors matching existing door leafs or field paint to match.*

R3.10-12 Recommendation: *Fabricate reproduction blinds and hardware from in-kind materials where units are missing. Treat all new materials with borate solution, and prime and paint selected blind color prior to installing.*

3.11 Miscellaneous Hardware and Fittings

A large assortment of miscellaneous hardware can be found throughout the Hildreth House exteriors. Examples of the range of items include hinges and catches for exterior blinds, awning anchors and operators, latches and retainers for screen doors and panels, planter hooks and brackets, and trellis anchorages, to name a few. Although mostly unused, these comprise an import part of the physical record of the historic house. Where their presence is benign (as is true in most circumstances) they should be left in place and painted to blend into their respective substrates (Fig. 79).

Occasionally some historic hardware elements are implicated in the deterioration of their respective substrates. Previously noted examples of these include abandoned wire trellises and associated anchors on the chimneys and in the edges of the veranda parapet caps (Fig. 80). Only where these have become detrimental, should they be documented by narrative description, mapped as to specific locations, and removed. If they are of unique interest or unknown purpose, they should be retained in storage in the attic for future reference.

R3.11-1 Recommendation: *Retain abandoned historic hardware in place where its presence is benign. Passivate corrosion, prime, and paint selected trim or shingle color as appropriate. Document, remove, and store in attic any abandoned hardware that cannot otherwise be prevented from causing deterioration to adjacent historic fabric.*

3.12 Exterior Finishes

While virtually all exposed wooden surfaces show evidence of having been painted for several generations, most of the paint has since heavily weathered. Historically, houses of this genre would have had painted trim, and sometimes wall shingles as well, although often as not the latter were treated with a linseed oil or a petroleum-based preservative and left to darken. Although little remains, the most recent paint scheme used on this house, incorporating warm gray trim and light cream shingles, was still compatible with historical precedents.

The Hildreth House is in dire need of repainting. Even though the majority of original trim has retained its integrity thus far, it is on the verge of suffering substantial loss if painted coatings are not renewed in the very near future. Loss of protection from painted coatings is implicated in a broad range of problems previously discussed, from curled and split wall shingles to the bird infestations of the porch columns. Painted coatings retard the rate of moisture uptake and hence lessen the shrinking and swelling cycles that loosen fastenings cause mechanical damage. Painted coatings also lessen the vulnerability to fungal and insect attack due to high moisture contents, and protect the organic materials from ultraviolet degradation. In fact, it is fortunate that the Hildreth House had painted coatings protecting its wall shingles for so many years, as this is likely the reason that any historic shingle materials have survived this length of time in service.

Modern practice often favors the substitution of semi-transparent or opaque stains on wood surfaces in lieu of paints because they are regarded as easier to apply, and it is easier to prepare surfaces to accept them. Unfortunately, these materials afford far less protection than paint, because the proportion of pigment is necessarily less in order to provide the stain-like properties. For the Hildreth House, opaque stains (the heaviest-bodied stains available) may be acceptable for the shingles, on the premise that it is extremely difficult to achieve good surface preparation on shingles that have heavy build-ups of paint. Stains however are inadequate to preserve most of the other wooden elements. An example of this is the condition of the parapet caps on the wheelchair ramp, which after only a few years in service are nearly unsalvageable, having been protected only with a stain product. On the other hand the historical parapet caps of the verandas that have for the most part been maintained with painted finishes still survive largely intact. For all wood trim, sash, and doors, only the highest quality of alkyd paint should be considered.

Having gone without coatings in exposed locations for so long, some wood elements, including both shingles and trim, may currently have a moisture content that is too high to successfully receive new coatings. Prior to painting, all suspected locations should be checked with a moisture meter. Coatings should only be applied to elements that have a moisture content of 15% or less. Elements that are higher in moisture content should be temporarily protected from the weather and allowed to dry. If they cannot be successfully dried, they should be replaced in-kind with new materials. Under no circumstances should pressure washing be used as a means of surface preparation. Such techniques will drive moisture contents above acceptable levels, and force moisture deep into the wall where it becomes entrapped, promoting fungal decay.

To ensure adequate protection and service life, all painting campaigns should utilize the highest quality materials available from one of the major paint manufacturers. Because most of the cost of painting is in the labor, it is false economy to use less expensive materials of lower quality.

R3.12-1 Recommendation: *Prepare, prime, and paint all shingled wall surfaces with two finish coats of opaque stain in selected body color.*

R3.12-2 Recommendation: *Prepare, prime, caulk, and paint all eaves, rakes, ceilings, soffits and trim with two finish coats of alkyd paint, in selected trim color.*

R3.12-3 Recommendation: *Prepare, prime, and paint all floors and treads with two finish coats of gray deck enamel.*

R3.12-4 Recommendation: *Prepare, prime, caulk, and paint all window sashes, and window and door trim with two finish coats of alkyd paint, in selected trim color.*

R3.12-5 Recommendation: *Prepare, prime, caulk, and paint all door leafs and blinds with two finish coats of alkyd paint, in selected door color.*

R3.12-6 Recommendation: *Treat troughs of all wood gutters with solvent-based preservative and recoat mastic trough splices. Prepare, prime, caulk, and paint all outer gutter surfaces with two coats of alkyd paint, in selected trim color.*

3.13 Exterior Lighting

Numerous exterior electric fixtures have been added to the verandas and the entries in recent years. Simple surface-mounted round-based globe fixtures illuminate the south, east, and west verandas, as well as the easterly doorway on the north elevation. Those on the south and east are wired via unpainted metal raceways running exposed across the veranda ceilings. These same fixtures have been relamped with fluorescent bulbs, and many are missing their glass globes (Fig. 81). Although the same fixtures appropriately wired on the north and west elevations are unobtrusive, the same fixtures with the above noted wiring configurations on the south and east are visually intrusive. At the very least, the raceways should be painted to blend into the adjacent trim, and the globes found and reinstalled, or replaced.

A line of exterior floodlighting has been added beneath the soffit of the south veranda. Comprised of two 2-lamp fixtures illuminating the front stair and ramp, and motion detectors near the east and west corners, all elements are strictly utility grade and indiscreetly surface-mounted to soffits, posts, and wall surfaces (Fig. 82). Beneath the veranda, a junction box serving this system has been left open with conductor splices protruding. These are liable to moisture infiltration and may eventually present a fire hazard (Fig. 83). As the components of these systems are otherwise in serviceable condition, their replacement is unwarranted. However the conduits and boxes should be painted to blend into the adjacent trim. At the ends of their respective service lives, these should be replaced with visually compatible fixtures and wiring configurations.

Exterior access path lighting is also present on the ramp, in the form of recessed fixtures mounted low on the inner walls, protected by louvered diffusers. These diffusers should also be painted the selected trim color (Fig. 75).

R3.13-1 Recommendation: *Reinstall missing globes on verandah ceiling light fixtures.*

R3.13-2 Recommendation: *Ensure that covers are properly installed on all exterior junction boxes.*

R3.13-3 Recommendation: *Prepare, prime, and paint all exposed conduits, boxes, and louvered diffusers the selected trim color.*

4.0 ENVIRONMENTS

4.1 Psychrometric Measurement

Water infiltrating into the cellar of the Hildreth House via the numerous avenues previously described is capable of producing markedly negative impact on the building's interior environments. For this reason it is useful to measure conditions both inside and outside the house to better understand the extent and dynamics of the problem. In museum houses, it is often necessary to continuously monitor psychrometric conditions over a long period of time in order to understand the structure's responses to changing conditions both daily and seasonally. While that may also be useful with respect to the Hildreth House, some understanding can be derived from occasional snapshot surveys as well. As an example, psychrometric conditions recently surveyed yielded the following results:

TABLE I – August 3, 2004 ***Variable Conditions - Sunny / Breezy***

Location	*Temp*	*RH*	*Dew-point*	*Time*
Exterior:	91.8 F	55.6 %	73.3 F	11:10 AM
	86.3 F	54.7 %	68.0 F	11.35 AM
(North of east veranda)				
Exterior: (West veranda)	82.5 F	55.3%	64.8 F	11:32 AM
Veranda Crawlspace (Beneath south veranda)	78.7 F	66.5%	66.6 F	11:29 AM
Cellar: (Near west chimney)	73.6 F	77.3 %	65.8 F	11:25 AM
First Story: (East/living room)	89.4 F	53.9 %	70.4 F	11:13 AM
Second Story: (Southeast/billiard room)	86.9 F	58.3 %	70.3 F	11:18 AM
Attic: (East room)	92.6 F	50.6 %	71.3 F	11:20 AM

4.2 Environmental Observations

Temperature, relative humidity, and dew point were measured with a hand held Panametrics MC-P digital hygrometer, beginning at 11:10 AM on August 3, 2004. Measurement data are listed in geographical order rather than chronological order. However, the sequence of measuring can be discerned from the *Time* column. The various entries under the exterior locations indicate that both temperature and dew point were fluctuating (although generally falling) during the period over which the survey was conducted. Under static conditions, dew points would normally be similar at all exterior locations, while temperatures and relative humidities might be slightly higher or lower depending on localized influences.

Interior dew points within the finished spaces would be expected to follow exterior dew points unless the envelope was particularly tight, or unless some mechanism was actively contributing humidification or dehumidification, whether purposefully or inadvertently. On the day of measurement, the living room door was open, and the room was readily exchanging air with the warmer outdoors. The second story space above by contrast was closed, and had not experienced the rapid rise in temperature that had occurred prior to commencement of the survey.

As expected, the highest relative humidities were recorded in the cellar and in the veranda crawlspace. These are consistent with the normally lower temperatures of these spaces, influenced by the thermal inertia of the masonry construction and the earth, which do not allow rapid equilibration of temperatures. Moreover, in spite of the visible dampness within both spaces, their respective dew points were not as high as outside in the open air.

Because the cellar walls appeared dry at the time of the survey (excepting localized infiltrations due to drainage problems), no surface temperatures were taken. These would normally be measured to determine whether surface dampness was more likely to be attributable to condensation or to infiltration. Rather, elevated dew points observed in the cellar on this day were likely attributable to the damp silt and wetness remaining on the concrete floor from earlier episodes of water infiltration; exterior fluctuations notwithstanding.

Elevated dew points in cellars nevertheless leave surfaces vulnerable frequent occurrences of condensation. Frequent condensation, especially in the colder months, tends to stain or deteriorate interior finishes, and accumulate in walls, increasing the risk of freeze-cycle damage. Condensation promotes dissolution and re-crystallization of salts on masonry surfaces. Runoff of condensation, where it wets wood surfaces, also promotes insect and fungal attack.

In addition to their role in elevating dew points, chronically high relative humidities are harmful in that they directly influence wood moisture content, which naturally seeks equilibrium with surrounding air conditions. Wood moisture content measured in numerous members throughout the cellar averaged slightly above 18%. While not yet critical, this is substantially higher than levels normally encountered in dry interiors, which in turn might range from 9% to 14%. Although fungal infestations generally require wood moisture excursions into the range of 28% to become established, once this occurs they are readily able to grow in wood with moisture contents as low as 20%. Insects, particularly beetles, favor similar conditions.

The cellar of this structure probably benefits from the drying effects of wintertime heating, particularly as there is no duct insulation to reduce inadvertent warming of this space. During the remainder of the year, both ventilation and active dehumidification might be effective tools for humidity control. Passive cellar ventilation is readily achievable in the Hildreth House because it benefits from relatively protected cellar windows that could be easily fitted with insect and security screens. The liability passive ventilation is that it occurs whether or not outside conditions are conducive to drying, and thus may at times make interior conditions worse. In fact, had passive ventilation been in effect the day of these measurements, conditions in the cellar would have been even worse. Active dehumidification on the other hand produces more reliable results, however at a significant operating and maintenance cost. Moreover, dehumidifiers become much less efficient as temperatures drop, and they are often not viable for use in swing seasons before the furnace is turned on.

R4.2-1 Recommendation: *Operate portable dehumidifier in the cellar from late spring to early autumn on an as-needed basis to reduce excessive relative humidity levels. Configure so that condensate is piped to drain, rather than accumulating in a reservoir.*

R4.2-2 Recommendation: *Conduct digital electronic monitoring of psychrometric conditions for a period of one year, to determine the full extent of the humidity problem and the most optimal and cost-effective measures for humidity control.*

5.0 UTILITIES

5.1 Electrical Service

Overhead electrical service is fed from a utility pole to the east of the structure, landing at a weather head tucked beneath the peak of the gambrel on the east elevation. The thermoplastic-sheathed service cable continues down the shingled wall surface just beneath the bed of the rake trim. At the eave, it turns the corner and crosses the north elevation's east wing just below the soffit, then drops down the northwest corner to the meter. Below the meter, the service runs in conduit to the base of the shingling, where it enters the structure through the building sill (Fig. 84). Inside, the service conduit traverses a crawlspace before entering the cellar at the main panel (Fig. 85). The present main panel on the north wall of the cellar is fitted with a 200 Amp main breaker, and contains 30 bays for branch circuit breakers, 11 of which are occupied. One of these branches feeds a sub panel located on the southerly face of the wood framed closet at the base of the west chimney. This sub panel, previously having served as the main panel, is situated adjacent to an abandoned meter base. It contains 20 breaker bays, 12 of which are occupied.

The present main panel is of recent origin, and probably adequate for the current use of the structure. However, no examination of the adequacy of the individual branches was made, and it is suspected that owing to the age of the house, there may be some branch wiring that does not comply with code for current use. Moreover, existing branches are not clearly identified on the main panel, and scarcely noted at all on the sub panel. If a methodical survey of wiring and devices as not been recently conducted, then one should be initiated, to ensure that the current uses are adequately served.

R5.1-1 Recommendation: *If not already done, perform a survey of the entire electrical system beginning with the service entrance and main panel. Identify the types, locations, and condition of all fixtures and devices served by each branch, as well as the adequacy of the wiring and connections thereto. Clearly identify all branches at the respective main and sub panels.*

5.2 Telephone and Cable Television Services

Telephone and cable television service are supplied from the same utility pole as the electric service. These meet the east elevation just north of the northerly second story window and follow the path of the electric service conductor to the vicinity of the electric meter. The telephone service runs to a terminal box at the base of the shingled wall below the electric meter, and thereby enters the cellar through the sill. The cable television service runs to a cluster of terminal blocks and signal splitters above the telephone terminal, from where additional cable branches depart to their respective destinations (Fig. 84).

The manner of cable service installation employed at the Hildreth House is the least expensive and least desirable, in that it has left a disorganized mess of conductors at the terminal block, as well as cables nailed on the surfaces of the shingles in long runs over the exterior, penetrating to the interior only at their respective destinations. Aside from being visually disfiguring, they offer numerous avenues of water entry as opposed to a single protected location, and they render repair and painting of shingles more difficult in the areas they traverse (Fig. 86). Some are very poorly secured to the building and are liable to inadvertent damage from snow shovels or lawn trimmers where they are draped over the terrace or the ground. Cable service should enter the building at a single location, and thereby distribute to its respective destinations in the same manner as the telephone lines.

R5.2-1 Recommendation: *Reconfigure cable television service to enter the building from a new terminal box situated adjacent to the telephone terminal box. Relocate all existing branches to the interior, fishing conductors through walls to terminate at wall plates.*

5.3 Gas Service

Gas service meets the building adjacent to the cellar window in the westerly wing of the north elevation (Fig. 21). The gas is piped through an exterior regulator and meter prior to entering the cellar through the building sill. From the cellar, gas is distributed to the water heater and to the kitchen range.

Running service entries through building sills compromises a critical structural element and is often a path of water entry and associated decay. Piped services should generally avoid building sills in favor of sleeved passages through masonry foundations. Both below and to the left of the current entry appear two abandoned entries (also through the sill) that have been left open to water penetration.

R5.3-1 Recommendation: *Patch sites of abandoned service entries near gas meter by plugging both sheathing and sill, and replacing the associated shingles.*

5.4 Fuel Oil Storage

Fuel oil is still used to fire the building's furnace. A 275 gallon steel tank located in the northwest corner of the cellar is served by fill and vent pipes penetrating the masonry foundation at the north end of the west elevation (Fig. 87). Over these is draped one of the unsecured cable television conductors.

There appears to have been some former oil staining on the cellar floor in the vicinity of the filter at the discharge port of the oil tank. The tank bottom is corroded due to its close proximity to a significant source of water ingress to the cellar. The tank and fittings should be inspected to ascertain whether the stain was from a leak or whether it was inadvertent spillage from changing the filter.

R5.4-1 Recommendation: *Determine the source of oil staining beneath the oil tank filter, and secure any leaking connections noted. Clean stain with poultice media and maintain tray as required to contain any future spills.*

5.5 Domestic Water

Domestic water service enters the cellar at the northwest corner of the north elevation adjacent to the conductor drain (Fig. 32). Although the water source is presumed to be a well, no pumping or pressure tank equipment are apparent in the cellar.

5.6 Sanitary Drainage

Sanitary drainage is collected in two principal cast iron stacks, which descend through the concrete cellar floor and exit to an unknown location (Fig. 88). A clogged floor drain is situated next to the easterly of the two stacks. The three conductor drains remaining in service also penetrate the concrete cellar floor, and likely join with the sanitary drain (Fig. 89). As the integrities of both stacks are suspect where they penetrate the floor, the drains should be surveyed to determine their specific routes, destinations, and conditions. The survey should also seek to determine whether adequate building vents, traps, and cleanouts exist (it is likely they do not), as well as the general adequacy of the septic system.

R5.6-1 Recommendation*: Survey the configuration and condition of the sanitary drainage system from the point of entry into the cellar floor to its final termination, and upgrade, repair, or replace components as required in accordance with the results thereof.*

R5.6-2 Recommendation: *Rehabilitate existing floor drain and install additional floor drain at base of stair inside the west cellar door.*

ILLUSTRATIONS

Fig. 1
South Façade of the Hildreth House.

Fig. 2
East Facade of the Hildreth House.

Fig. 3
West Facade of the Hildreth House.

Fig. 4
North Facade of the Hildreth House as viewed from the Northeast.

Fig. 5
North Façade of the Hildreth House as viewed from the Northwest.

Fig. 6
Closely planted shrubs along the east veranda in need of pruning.

Fig. 7
Volunteer trees, shrubs, and vines overwhelming the west veranda.

Fig. 8
Leaves accumulating in the corner of the east veranda.

Fig. 9
Abandoned planter pots and boxes on the west veranda.

Fig.10
Exposed ledge in the easterly portion of the cellar, with crawlspace access beyond.

Fig. 11
East elevation conductor discharge scours soil and enters the crawlspace through the foundation.

Fig. 12
South Elevation conductor discharge scours soil and enters the crawlspace through the foundation.

Fig. 13
Water traverses the south veranda crawlspace to gain entry into the cellar.

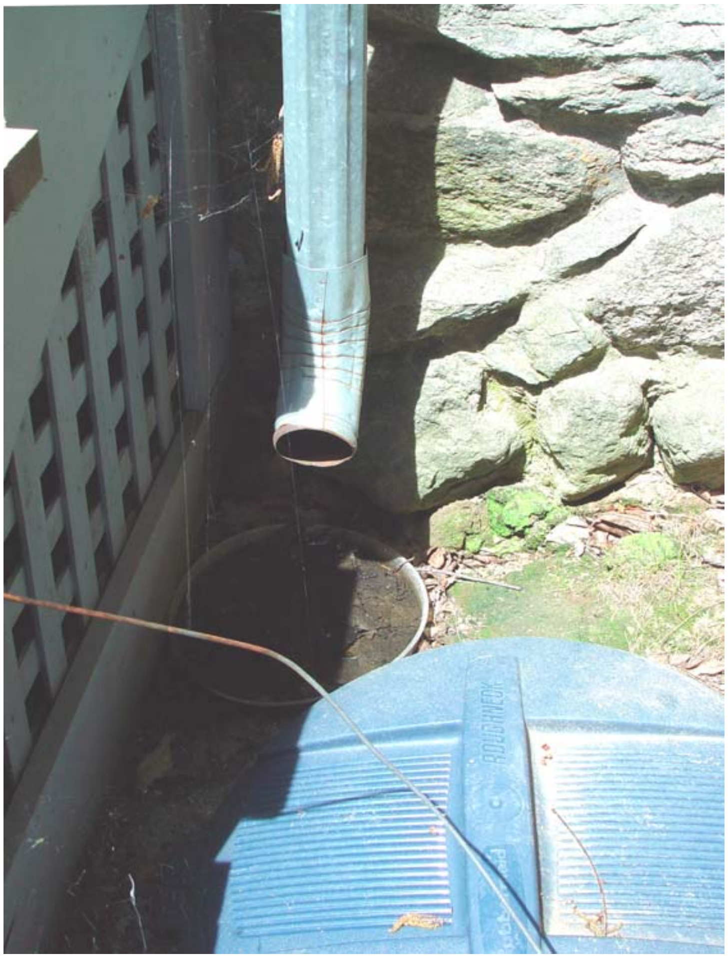

Fig. 14
Water discharge runs beneath west veranda stair to left.

Fig. 15
Threshold and bottom rail of west cellar door lie partially buried in soil.

Fig. 16
Wet silt spreading over cellar floor from beneath west cellar door.

Fig. 17
Foundation stones missing from beneath lattice sill.

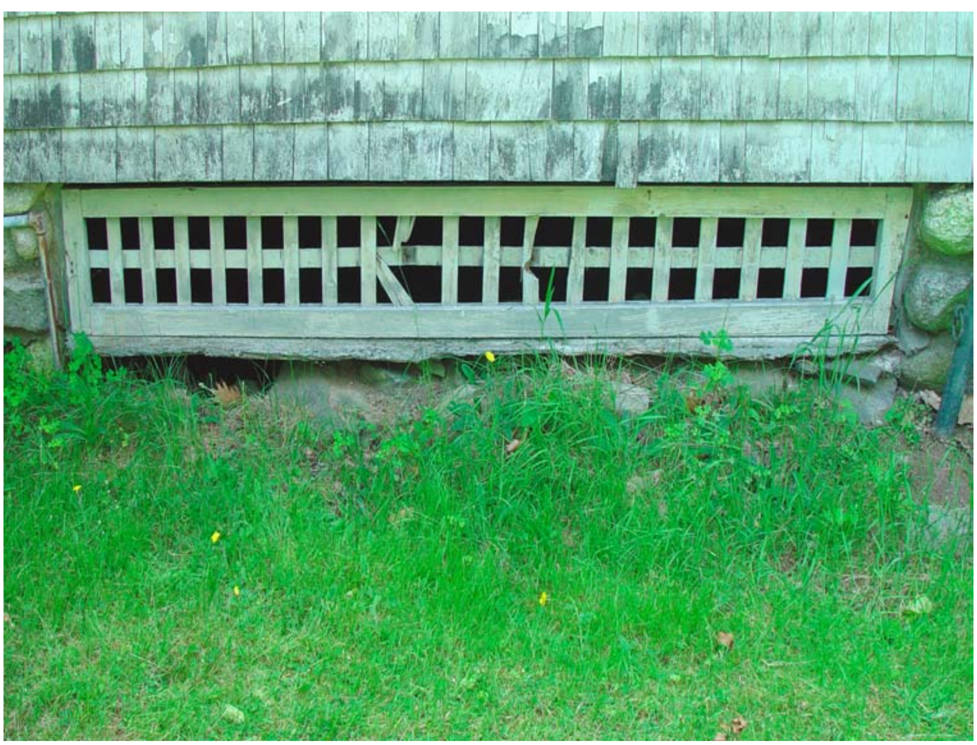

Fig. 18
Water discharge runs directly into foundation.

Fig. 19
Grade pitches into foundation beneath stoop.

Fig. 20
Water finds entry along juncture of terrace pavement and wood framed wall.

Fig. 21
Sill of boarded cellar window is partially buried in earth.

Fig. 22
Drain connection haphazardly patched to remedy water scouring and penetrating foundation.

Fig. 23
Water infiltrates the foundation wall at the entry of the northwest conductor drain.

Fig. 24
Open leg of conductor drain wye fitting allows overflows into cellar.

Fig. 25
Abandoned conductor drain in crawlspace of south veranda.

Fig. 26
Foundation masonry with only uppermost courses pointed, as viewed from veranda

Fig. 27
Repair mixes not well matched to historic mortar.

Fig. 28
Shrinkage cracks in upper courses and erosion of mortar near grade typical on easterly reaches of north elevation.

Fig. 29
Settlement cracking in mortar joints at northwest corner.

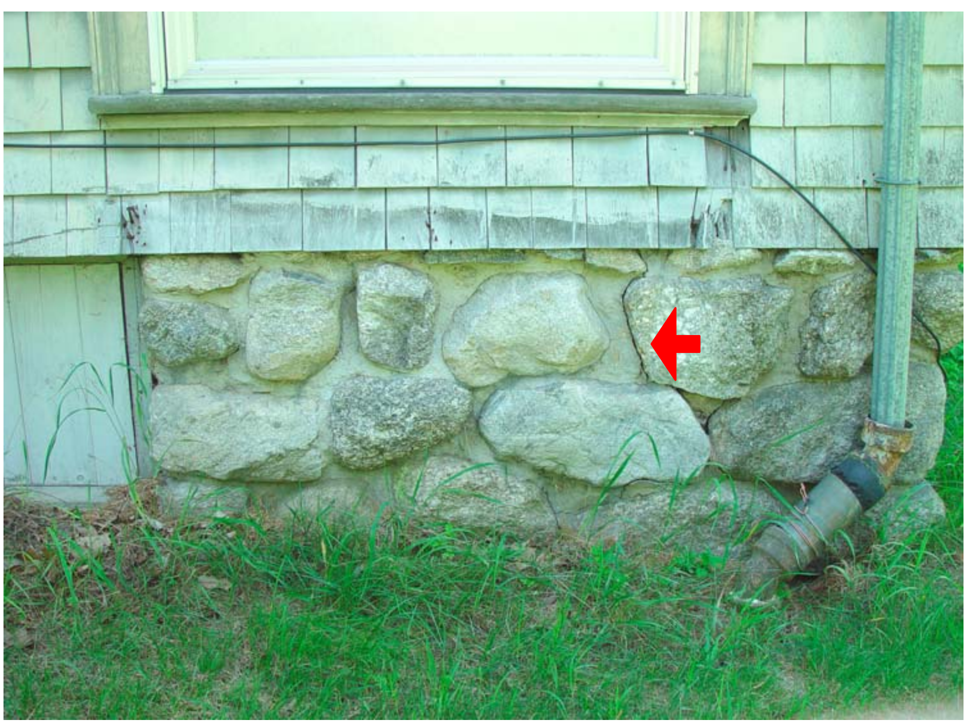

Fig. 30
Stones displaced at northwest corner of west veranda foundation.

Fig. 31
Settlement cracking in mortar joints at southwest corner of south veranda.

Fig. 32
Examples of foundation wall penetrations in need of sealants.

Fig. 33
Remnants of iron pins formerly securing the north terrace balustrade.

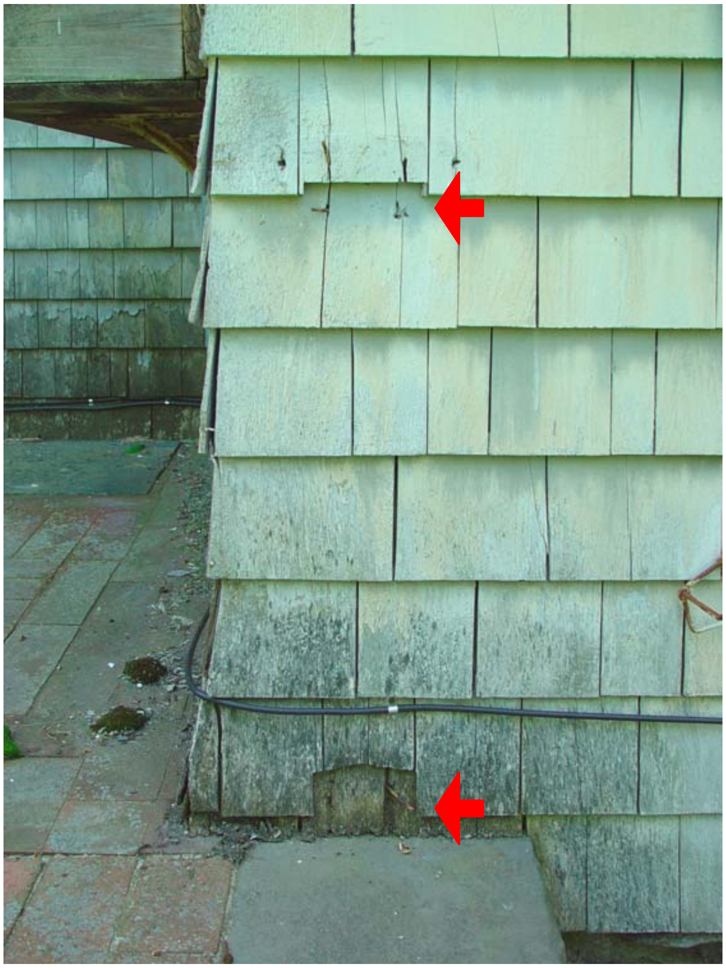

Fig. 34
Evidence of former north terrace balustrade engaging the shingled wall.

Fig. 35
Heavy organic growths in joints of terrace paving.

Fig. 36
Arching of door threshold providing circumstantial evidence of deteriorated building sill at north terrace.

Fig. 37
Corroding iron frames of areaway covers.

Fig. 38
Ferrous stains emanating from abandoned trellis on east chimney.

Fig. 39
Ferrous stains emanating from abandoned trellis on west chimney.

Fig. 40
North dormer plaster damage leading to recent replacement of northerly slope of main roof.

Fig. 41
Framing for abandoned ventilating scuttle on north slope of main roof.

Fig. 42
Vertical cracking across shingle courses of south veranda roof.

Fig. 43
Juncture of roofing and wall shingles vulnerable to water infiltration.

Fig. 44
Framing for abandoned ventilating scuttles on south slope of main roof.

Fig. 45
Plaster loss adjacent to frame of abandoned center scuttle.

Fig. 46
Curling of shingles on south slope of main roof.

Fig. 47
Recent plaster loss from southwest chamber.

Fig. 48
Leakage along the west face of the east chimney.

Fig. 49
Remnant of original gutter on north eave of west veranda.

Fig. 50
Juncture of original belt and rake profiles with modern incompatible gutter profile.

Fig. 51
Rusted galvanized gutter on north elevation west dormer creating pronounced staining on roof shingles.

Fig. 52
Discharge elbow of galvanized conductor set high off the ground.

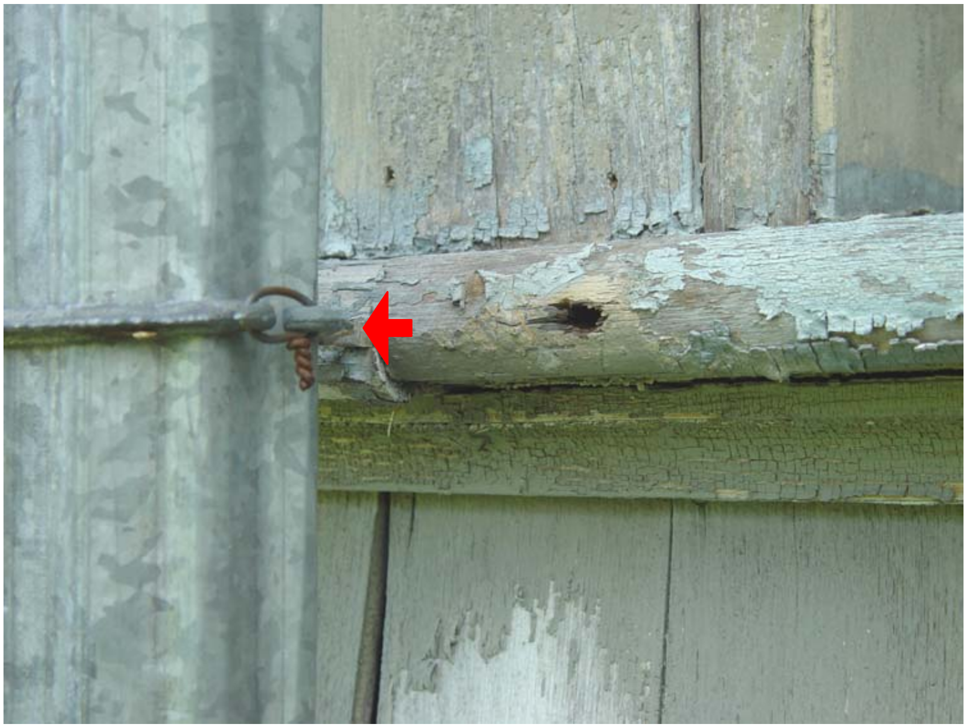

Fig. 53
Pintle of conductor bracket driven into edge of veranda parapet cap.

Fig. 54
Failed fastenings and open joints in gambrel rake trim.

Fig. 55
Soffit shingles previously removed to enable reinforcement of sheathing.

Fig. 56
Extensive deterioration of fascia above north elevation gutters.

Fig. 57
Shingles in west gable subjected to deterioration from ultraviolet radiation.

Fig. 58
Failure of face-nailed shingles at locations where blown-in insulation has been introduced.

Fig. 59
Open and deteriorating corners resulting from edge-nailing of shingles.

Fig. 60
Southeast corner of veranda where support conditions of flooring may be marginal.

Fig. 61
Arched parapet caps suggesting post loads may be compressing the parapet sill.

Fig. 62
Woodpecker holes in veranda post casings.

Fig. 63
Concentration of fasteners driven into edges of parapet caps.

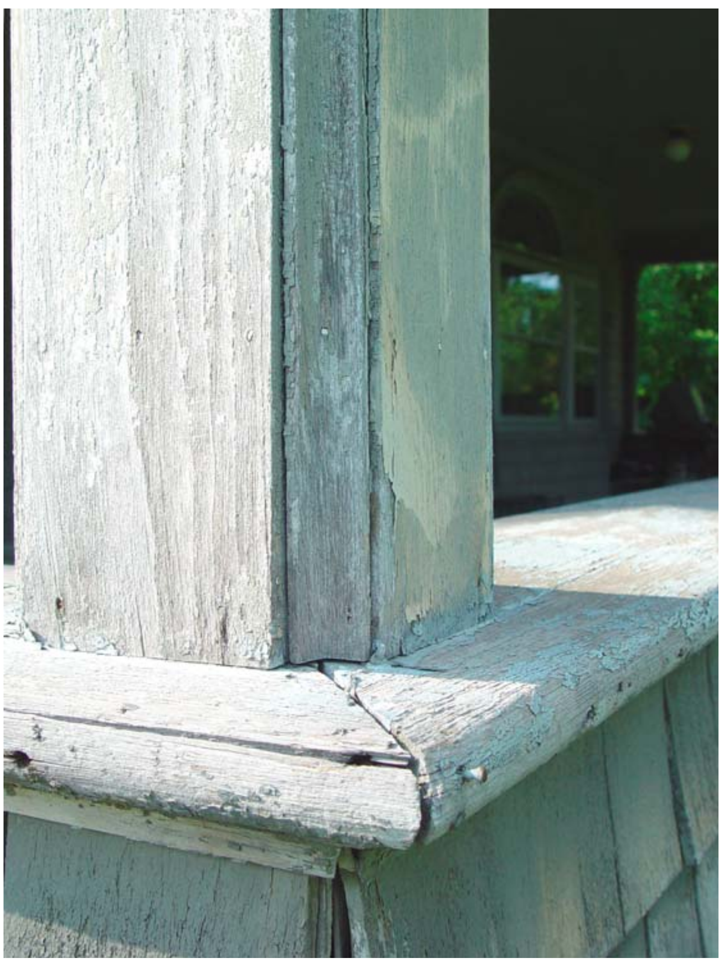

Fig. 64
Splits at joints due to ill-planned placement of hardware.

Fig. 65
Zinc flashing beneath the threshold of the west veranda service door engages the canvas floor cladding.

Fig. 66
Sill for screen panel crossing the canvassed west veranda floor.

Fig. 67
Water stains on underside of west veranda sub flooring, as viewed from cellar.

Fig. 68
West balcony balustrade and awning frame.

Fig. 69
Heavily deteriorated west balcony floor decking and sleepers beneath.

Fig. 70
Main front entry stair, with modern posts and steel grab bar railings.

Fig. 71
Recently rebuilt west veranda stair.

Fig. 72
Modern stair at easterly door on north elevation is in marginal condition.

Fig. 73
Missing stair at westerly door on north elevation should be reinstated.

Fig. 74
Opening of miters and cross-joints, and severe checking have developed in the new wheelchair ramp parapet caps.

Fig. 75
MDO plywood cladding interior sides of ramp parapets are damp and supporting heavy algae growths.

Fig. 76
Minor checking and decay developing in upper story windowsills. Also note open joint of bed molding.

Fig. 77
Exterior blinds are generally in poor condition except where protected beneath veranda roofs.

Fig. 78
Lower rails and stiles of west cellar door are deteriorated from ground contact.

Fig. 79
Obsolete historic hardware on post adjacent to ice box door is benign and should be left in place.

Fig. 80
Abandoned anchors such as these in the edges of parapet caps should be removed only if they are causing deterioration (these are not).

Fig. 81
Veranda ceiling fixtures rewired with inappropriate surface-run raceways and relamped with fluorescent bulbs.

Fig. 82
Surface mounted conduits and fixture boxes of exterior floodlight system.

Fig. 83
Junction box beneath south veranda with protruding conductor splices and missing cover.

Fig. 84
Electric, telephone, and cable television service entries.

Fig. 85
Electrical main panel on north wall of cellar.

Fig. 86
Cable television branch conductors traverse exterior wall surfaces to reach their destinations.

Fig. 87
Poorly secured cable television branch conductors draped over the oil fill and vent pipes.

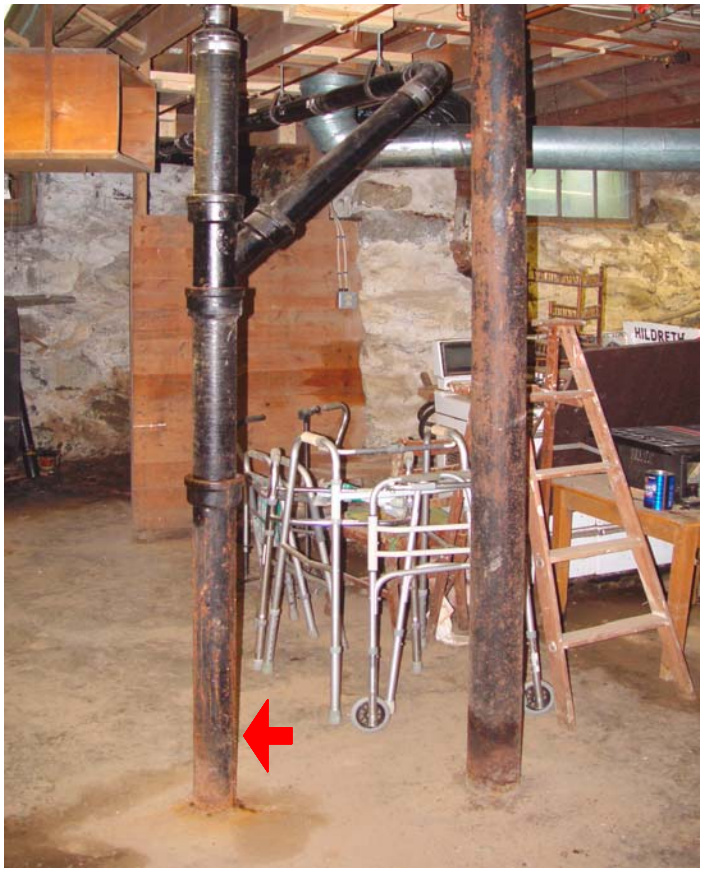

Fig. 88
One of two main sanitary drains penetrating the concrete cellar floor.

Fig. 89
Conductor drains on north wall of cellar converge and penetrate the concrete floor.

APPENDIX A: *PRIORITIZED RECOMMENDATIONS*

PRIORITIZED RECOMMENDATIONS

Following is a recapitulation of the report recommendations, prioritized into four levels of urgency. These include Level I – Triage; Level II – Critical Concerns; Level III – Significant Concerns; and Level IV – Maintenance and Integrity Concerns.

Recommendations summarize, for planning purposes, the general interventions required. In most instances, further design of treatments is necessary before they can actually be applied. Costs are expressed in order-of-magnitude estimates, for contracted construction work (excluding design and contingency), in 2004 dollars. These are intended for rough budgeting purposes only, and would normally be refined during the process of design and preparation of contract plans and specifications.

LEVEL I RECOMMENDATIONS –
TRIAGE:
Proposed work elements address immediate threats to the structure in an attempt to mitigate and forestall current and ongoing damage.

Elements within this priority level appear in order of subject matter.

2.1 Site Vegetation: $0

R2.1-1 *Prune shrubbery along the east veranda to minimize physical contact with the shingled surfaces. (Volunteer Labor) ($N/A)*

R2.1-2 *Remove vines growing on the west veranda and prune shrubbery to minimize physical contact with the shingled surfaces. Also remove volunteer trees growing within 10 feet of the veranda. (Volunteer Labor) ($N/A)*

R2.1-3 *Remove abandoned planter pots and boxes, as well as other discarded items, from the west veranda and adjacent to its stairway. Also sweep leaves and accumulated dead vegetation from the east and west verandas. (Volunteer Labor) ($N/A)*

2.2 Site Drainage $11,525

R2.2-1 *Fill all sinkholes, burrows, depressions, and scours adjacent to the masonry foundation. Add limited quantities of soil along perimeter of foundation to achieve a positive gradient away from the building. Also re-*

grade existing soil in the crawlspaces of the south and east verandas to slope away from the main building foundations. Note that it may not be possible to achieve appropriate gradients in all areas due to other localized conditions such as driveway pavements or low-lying windowsills. Avoid creating new depressions adjacent to these. *($1,900)*

R2.2-2 *Provide historically appropriate masonry surface troughs to receive water from conductors on the east, north, and west elevations that currently discharge into open air, and direct the runoff sufficiently away from the building.* *($2,600)*

R2.2-4 *Re-grade areaway outside the westerly cellar door to remove earth from sill and lower reaches of the door itself, and slope to achieve positive drainage down the embankment to the west. The embankment flanking the areaway on the south may require stabilization to prevent future encroachment on the doorway.* *($1,700)*

R2.2-5 *Reinstate drains serving the 3 south veranda conductors so that water is received directly into respective historic cast iron boots and is piped through the veranda foundation wall into the crawlspace. Intercept the cast iron lines in the crawlspace with a new PVC trunk line directed through the west end of the south veranda foundation below grade, discharging to daylight sufficiently down the embankment to the west. Also install new cast iron boot and PVC drain to receive discharge from conductor at southwest corner of south elevation (adjacent to west veranda stair) and connect below grade to the new trunk serving the south veranda conductors. Cap and abandon in place the remaining portions of the cast iron drains.* *($5,250)*

R2.2-6 *Cap the leg of the wye fitting in the cast iron drain along the interior of the north cellar wall.* *($ 75)*

3.1 Foundations **$300**

R3.1.5 *Install (from interior) sealant around all below-grade pipe penetrations of the north and south cellar walls.* *($ 300)*

3.3 Chimneys **$5,850**

R3.3-1 *When the south slopes of the main gambrel roof are reshingled, document and remove the ferrous trellis system and associated anchors. Inspect and provide repairs to caps and flues as required. Repoint deteriorated masonry joints (presuming approximately 30% of surface area), and point in new lead counter flashings to receive base flashings provided during the reshingling.* *($5,850)*

3.4 Roofing and Flashing $9,705

R3.4-1 *Remove existing and replace shingles on the south upper and lower slopes of the main gambrel roof, also replacing in-kind any deteriorated roof sheathing encountered. Incorporate new lead coated copper flashings at intermediate ridges and chimney bases, and in the apron zone along the veranda roof interfaces. Incorporate wood shingle drips along eaves and rakes. Underlay all flashings, as well as all ridges, closed valleys, eaves, and rakes, with bituminous polyethylene membrane.* *($9,705)*

3.10 Doors, Windows, and Blinds **$500**

R3.10-1 *Document locations and remove all surviving exterior window blinds, including any fragments thereof as well as those lying loose around the site. Store in attic for future repair.* *($ 500)*

3.13 Exterior Lighting **$250**

R3.13-2 *Ensure that covers are properly installed on all exterior junction boxes.* *($ 250)*

TOTAL LEVEL I: **$28,130**

NOT including design, contingency, or per annum escalation

LEVEL II RECOMMENDATIONS –
CRITICAL CONCERNS:
Proposed work elements address conditions that may pose the threat of loss or damage at any time in the immediate future.

Elements within this priority level appear in order of subject matter.

2.2 Site Drainage $8,900

R2.2-7 *Intercept the 3 cast iron drains penetrating the north wall of the cellar with new PVC trunk line immediately inside the cellar wall. Run new trunk along general route of existing lines, penetrating the floor where the cellar extends beneath the west veranda. Direct the trunk below grade beneath the cellar doorway and discharge to daylight sufficiently down the embankment to the west. Add an areaway drain immediately outside the cellar door and connect to the new PVC trunk passing beneath.* *($5,500)*

R2.2-8 *Add new drains in the bottoms of the three areaways in the north terrace. Pipe the discharge through the north cellar wall and tie into the new PVC trunk installed per Recommendation R2.2-7.* *($3,400)*

3.1 Foundations $1,800

R3.1-1 *Repoint the easterly end of the north elevation with appropriate sand-lime mix (approximately 30% of surface area), addressing open and extensively weathered joints, as well as inappropriate prior Portland cement repairs. Recover and reset missing foundation stones beneath the sill of the latticed opening at the northerly end of the east veranda.* *($ 650)*

R3.1-3 *Repoint developed settlement cracks at the northwest corner of the north elevation, and the southwest corner of the south veranda with appropriate sand-lime mix. Reset displaced stones and repoint northwest corner of west veranda. Localized excavation may be required to reveal the full extent of the cracking systems and displacements. Also repoint interior northwest corner of cellar wall at corresponding crack location.* *($1,150)*

3.2 North Terrace $6,150

R3.2-4 *Carefully remove paving from a 1-foot wide zone along the entire length of engagement with the wood framed walls. Inspect the condition of the buried wood sheathing and framing, and replace deteriorated elements with borate-treated materials as required. Reinstall masonry paving incorporating a membrane and a 1-inch air gap between paving and wood elements. Cover open top of the air gap with lead-coated copper counter flashing integrated into the base course of shingles above.* *($6,150)*

3.5 Gutters and Conductors $2,110

R3.5-1 *Replace in kind any conductor sections that are heavily corroded or perforated. Where conductor drains have been reinstated, extend conductors to engage them. Configure conductor connection with drain to enable easy removal of conductor for cleaning. Where masonry surface troughs have been installed, extend lengths of respective conductors so that discharge elbows lay directly in them. ($1,720)*

R3.5-3 *Remove all conductor hangers from veranda wall caps and relocate them to the first course of shingles below the caps. Custom-length pintles or discretely placed blocking may be required. ($ 390)*

3.6 Rakes, Eaves, Soffits, and Miscellaneous Trim $8,650

R3.6-2 *Replace in-kind the fascias above the north elevation gutters on both the east and west wings. Clad with flat lock-seam lead coated copper, extending under the bottom course of roof shingles. Extend cladding into troughs of respective gutters and cleat to outer lips to form a lining. Prime the cladding and paint the selected trim color. ($4,100)*

R3.6-3 *Execute epoxy or spliced infill patching of south elevation eave trim, paying particular attention to the cornices above the octagonal bays. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color. ($2,300)*

R3.6-4 *Execute minor epoxy patching of east elevation rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color. ($2,250)*

3.7 Wall Cladding $5,695

R3.7-1 *Remove existing and reshingle all south veranda outside wall surfaces below the parapet cap, as well as all wall surfaces comprising the second story dormers. ($5,695)*

3.8 Verandas and Balconies $11,950

R3.8-3 *Execute epoxy or spliced infill patching of veranda post and entablature facings. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color. ($2,900)*

R3.8-5 *Carefully remove flooring at southeast corner of south veranda to inspect condition of framing. Augment support as required and reinstall flooring. Prepare, prime, and paint all veranda floors with a gray deck enamel. ($1,450)*

R3.8-6 *Document and carefully remove decking, balustrade, and awning frame from west balcony. Replace roll roofing with new to match existing, complete with bituminous polyethylene underlayment and lead coated copper flashings. Install new balcony sleepers and decking matching original configurations. Reproduce deteriorated balustrade and awning frame elements. Preservative treat and prime all reproduction and remaining original wood balustrade and awning frame elements, and reinstall. Paint completed work with selected trim color. ($7,600)*

3.9 Exterior Stairs and Ramps $4,650

R3.9-2 *Replace missing stair formerly serving the north elevation west wing doorway with new code-compliant stair, detailed to be visually compatible with the historic setting. ($2,700)*

R3.9-5 *Add code-compliant railings to west veranda stair, detailed to be visually compatible with the historic setting. ($1,950)*

3.10 Doors, Windows, and Blinds $12,155

R3.10-2 *Remove window sashes having broken lights or deteriorated joints (approximately 26 units) and execute epoxy or pieced-in repairs and reglazing as required. Prime and paint sash prior to reinstalling. ($10,400)*

R3.10-6 *Fabricate and install new aluminum storm panels for attic story windows and west elevation oval window, configured in a manner to allow operation of the sash for ventilation. Remove and store existing wood storm panel covering oval window. Prime and paint new units the selected sash color. ($1,755)*

4.2 Environmental Observations $650

R4.2-1 *Operate portable dehumidifier in the cellar from late spring to early autumn on an as-needed basis to reduce excessive relative humidity levels. Configure so that condensate is piped to drain, rather than accumulating in a reservoir. ($ 650)*

5.1 Electrical Service $3,500

R5.1-1 *If not already done, perform a survey of the entire electrical system beginning with the service entrance and main panel. Identify the types, locations, and condition of all fixtures and devices served by each branch, as well as the adequacy of the wiring and connections thereto. Clearly identify all branches at the respective main and sub panels. ($3,500)*

5.6 Sanitary Drainage $4,150

R5.6-1 *Survey the configuration and condition of the sanitary drainage system from the point of entry into the cellar floor to its final termination, and upgrade, repair, or replace components as required in accordance with the results thereof.* *($2,750)*

R5.6-2 *Rehabilitate existing floor drain and install additional floor drain at base of stair inside the west cellar door.* *($1,400)*

TOTAL LEVEL II: $70,360

NOT including design, contingency, or per annum escalation

LEVEL III RECOMMENDATIONS –
SIGNIFICANT CONCERNS:

Proposed work elements address conditions that may pose the threat of loss or damage within the next three years.

Elements within this priority level appear in order of subject matter.

2.2 Site Drainage $2,700

R2.2-3 *Provide historically appropriate masonry areaway to allow unearthing of the sill of the westerly cellar window on the north elevation. Provide areaway drainage into the conductor drain adjacent to the west.* *($2,700)*

3.1 Foundations $1,600

R3.1-2 *Repoint the westerly end of the south veranda with appropriate sand-lime mix (approximately 30% of surface area), addressing open and extensively weathered joints, as well as inappropriate prior Portland cement repairs.* *($ 400)*

R3.1-4 *Pack with oakum and repoint around cellar door and window frames with appropriate sand-lime mix (approximately 75% of total perimeter length), addressing open and extensively weathered joints.* *($1,200)*

3.2 North Terrace $3,300

R3.2-1 *Remove all vegetation growing in the joints of the terrace paving, reset all heaved brick pavers, and re-grout the joints with a dry sand-lime mix that is dampened after placement.* *($1,600)*

R3.2-2 *Repoint all head and bed joints of the perimeter sandstone copings with appropriate sand-lime mix.* *($ 850)*

R3.2-3 *Remove areaway glazing to access the respective iron frames. Remove loose corrosion, passivate the surfaces, prime with a zinc-rich primer, and paint. Reset the glazing with a sealant that is visually and physically compatible with the paint system employed.* *($ 850)*

3.4 Roofing and Flashing $9,590

R3.4-2 *Remove existing and replace shingles on the south, east, and west veranda roofs, also replacing in-kind any deteriorated roof sheathing encountered. Incorporate new lead coated copper base and apron flashings at junctures with adjacent roof and wall planes. Underlay all flashings, as well as all ridges and eaves with bituminous polyethylene membrane.* *($9,590)*

3.5 Gutters and Conductors $390

R3.5-3 *Remove all conductor hangers from veranda wall caps and relocate them to the first course of shingles below the caps. Custom-length pintles or discretely placed blocking may be required.* *($ 390)*

3.6 Rakes, Eaves, Soffits, and Miscellaneous Trim $4,325

R3.6-1 *Reinstall missing soffit shingles and replace in-kind any damaged shingles.* *($ 600)*

R3.6-5 *Execute minor epoxy patching of west elevation rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.* *($2,250)*

R3.6-6 *Execute minor epoxy patching of north elevation eave and rake trim. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color.* *($1,475)*

3.7 Wall Cladding $12,490

R3.7-2 *Remove existing and reshingle all east veranda outside wall surfaces below the parapet cap, as well as all areas above the east veranda roof.* *($5,580)*

R3.7-3 *Remove and reshingle all west veranda outside wall surfaces below the parapet cap, as well as all areas above the veranda roof and balcony deck, and approximately 20% of shingles below the balcony deck. Also remove and reshingle the west outside wall of the south veranda.* *($5,285)*

R3.7-4 *Remove and reshingle approximately 5% of the north outside wall of the east veranda, plus miscellaneous shingles around the electrical meter and the lower outside west corner of the east wing, and approximately 5% of the northerly face of the west wing. Also remove and reshingle 10% of the three respective wall surfaces adjoining the paved terrace. In addition, remove and reshingle the bottom 3 courses of the same three wall surfaces, incorporating new hidden lead-coated copper counter flashings to cover air-gaps introduced during restoration of the north terrace.* *($1,445)*

R3.7-5 *Remove and replace individual shingles at outside corners where joints have opened or shingles have split due to inappropriate edge nailing.* *($ 180)*

3.8 Verandas and Balconies $6,880

R3.8-1 *Create scuppers through the screen frame sill at the floor of the west veranda to allow drainage of the northerly portion. Scuppers should be flashed with copper, which is in turn sealed to the respective canvas membranes on either side of the sill. ($ 550)*

R3.8-2 *Execute epoxy or spliced infill patching of veranda parapet caps and bed moldings, paying particular attention to the end joints at the respective posts. Renail all failed anchorages, and caulk all joints. Prepare, prime, and paint selected trim color. ($2,300)*

R3.8-4 *Renail all failed veranda ceiling anchorages. Prepare, prime, and paint selected trim color. ($4,030)*

3.9 Exterior Stairs and Ramps $13,600

R3.9-1 *Remove existing and reconstruct new code-compliant south veranda stair, detailed to be visually compatible with the historic setting. ($2,350)*

R3.9-3 *Remove existing and reconstruct new code-compliant stair to serve the north elevation east wing doorway, utilizing existing concrete footings. ($2,350)*

R3.9-4 *Remove deteriorated ramp baluster caps, and alter ramp wall height to match elevation of veranda walls. Install wood shingle cladding in lieu of MDO plywood on interior faces of ramp walls. Install new plank caps with reconfigured profile and butt joints, and new bed moldings beneath. Install new pipe rail guards at same elevation as veranda guards. Pre-treat all new wood elements with borate solution and full priming. Caulk and paint all trim elements with at least two coats of selected trim paint, and apply at least two coats of stain to all shingles. ($8,900)*

3.10 Doors, Windows, and Blinds $28,800

R3.10-3 *Remove exterior storm units and execute epoxy repairs to deteriorated casings and sills of second and attic story windows on the south, east, and west elevations (approximately 14 units). Prime and paint selected trim color, and reinstall storm units. ($5,600)*

R3.10-4 *Remove exterior storm units and execute epoxy and pieced-in repairs to deteriorated casings and sills of first, second, and third story windows on the north elevation (approximately 6 units) south, east, and west elevations. Prime and paint selected trim color, and reinstall storm units. ($2,400)*

R3.10-5 *Prepare, prime and paint all sashes, doors, storm units, and trim (not otherwise painted in the course of repairs) with respective selected trim, sash, and door colors. ($14,500)*

R3.10-7 *Remove existing west elevation cellar door and execute epoxy or pieced-in repairs as required. Prime and paint with selected door leaf color prior to reinstalling. Also execute epoxy or pieced-in repairs to lower frames and sill. Prime and paint selected trim color.* *($1,650)*

R3.10-8 *Remove existing cellar and veranda crawlspace sash and panels where frames are deteriorated. Execute epoxy or pieced-in repairs to frames, and reinstate appropriate staff beads where missing. Prime and paint frames the selected trim color. Repair existing east veranda lattice with in-kind materials fabricate new appropriately detailed lattice to replace that missing from the west end of the south veranda. Execute epoxy or pieced-in repairs and reglazing as required on all cellar sashes, and furnish new to match existing where missing. Prime and paint sashes prior to reinstalling. Repair, prime, paint, and reinstall wood security panels over cellar sash if required, or fabricate and install new glazed aluminum storm panels set recessed into respective frames, and painted the selected sash color.* *($4,650)*

3.11 Miscellaneous Hardware and Fittings $750

R3.11-1 *Retain abandoned historic hardware in place where its presence is benign. Passivate corrosion, prime, and paint selected trim or shingle color as appropriate. Document, remove, and store in attic any abandoned hardware that cannot otherwise be prevented from causing deterioration to adjacent historic fabric.* *($750)*

4.2 Environmental Observations $3,500

R4.2-2 *Conduct digital electronic monitoring of psychrometric conditions for a period of one year, to determine the full extent of the humidity problem and the most optimal and cost-effective measures for humidity control.* *($3,500)*

5.2 Telephone and Cable Television Services $1,450

R5.2-1 *Reconfigure cable television service to enter the building from a new terminal box situated adjacent to the telephone terminal box. Relocate all existing branches to the interior, fishing conductors through walls to terminate at wall plates.* *($1,450)*

5.3 Gas Service $350

R5.3-1 *Patch sites of abandoned service entries near gas meter by plugging both sheathing and sill, and replacing the associated shingles.* *($ 350)*

5.4 Fuel Oil Storage **$350**

R5.4-1 *Determine the source of oil staining beneath the oil tank filter, and secure any leaking connections noted. Clean stain with poultice media and maintain tray as required to contain any future spills.* *($ 350)*

TOTAL LEVEL III: **$90,075**

NOT including design, contingency, or per annum escalation

LEVEL IV RECOMMENDATIONS –
MAINTENANCE / INTEGRITY CONCERNS:
Proposed work elements are focused on perpetuating the future viability of the structure and its significant component parts; and on reinstating previously lost or altered configurations to preserve historical integrity.

Elements within this priority level appear in order of subject matter.

1.3 Treatment Philosophy $10,000 - $25,000

R1.0-1 *Prepare an Historic Structure Report that incorporates and augments existing archival research on the Hildreth House along with a detailed physical analysis of exterior and interior features in order to provide a complete understanding of its evolution. The report should characterize the relative significance of each feature, and recommend their ultimate dispositions with respect to any future maintenance or alteration of the structure. (Range depending on scope - $10,000 - $25,000)*

3.2 North Terrace $7,600

R3.2-5 *Reconstruct north terrace balustrade, matching profiles and configurations of original west balcony balustrade. Augment with sympathetically designed code-compliant guard and handrails. ($7,600)*

3.5 Gutters and Conductors $2,650

R3.5-2 *Passivate existing corrosion, prime with zinc-rich primer, and paint conductors the selected wall shingle color. ($2,650)*

3.10 Doors, Windows, and Blinds $22,225

R3.10-9 *Remove for inspection the plywood covering of the crawlspace access door off the north terrace. Execute epoxy or pieced-in repairs to door if extant, or replace with new beaded matchboard and batten door if original is missing. Treat all new materials with borate solution, and prime and paint selected door leaf color. ($ 750)*

R3.10-10 *Execute epoxy or pieced-in repairs to substantially intact window blinds as required (approximately 22 panels). Prime and paint selected blind color prior to reinstalling. Retain all non-viable units in attic storage for future reference and repair stock. ($5,575)*

R3.10-11 *Remove existing aluminum storm doors and replace with new units comprised of single large glazed area with minimum enframement. Obtain new units in factory colors matching existing door leafs or field paint to match. ($3,300)*

R3.10-12 *Fabricate reproduction blinds and hardware from in-kind materials where units are missing. Treat all new materials with borate solution, and prime and paint selected blind color prior to installing.* *($12,600)*

3.12 Exterior Finishes **$25,675**

R3.12-1 *Prepare, prime, and paint all remaining shingled wall surfaces with two finish coats of opaque stain in selected body color.* *($11,350)*

R3.12-2 *Prepare, prime, caulk, and paint all remaining eaves, rakes, ceilings, soffits and trim with two finish coats of alkyd paint, in selected trim color.* *($9,225)*

R3.12-3 *Prepare, prime, and paint all floors and treads with two finish coats of gray deck enamel.* *($3,600)*

R3.12-4 *Prepare, prime, caulk, and paint all window sashes, and window and door trim with two finish coats of alkyd paint, in selected trim color.* *(Estimated in Section 3.10)* *($N/A)*

R3.12-5 *Prepare, prime, caulk, and paint all door leafs and blinds with two finish coats of alkyd paint, in selected door color.* *(Estimated in Section 3.10)* *($N/A)*

R3.12-6 *Treat troughs of all wood gutters with solvent-based preservative and recoat mastic trough splices. Prepare, prime, caulk, and paint all outer gutter surfaces with two coats of alkyd paint, in selected trim color.* *($1,500)*

3.13 Exterior Lighting **$750**

R3.13-1 *Reinstall missing globes on verandah ceiling light fixtures.* *(Volunteer Labor)* *($N/A)*

R3.13-3 *Prepare, prime, and paint all exposed conduits, boxes, and louvered diffusers the selected trim color.* *($ 750)*

TOTAL LEVEL IV: **$68,900 – 83,900**

NOT including design, contingency, or per annum escalation

APPENDIX B: *MORTAR ANALYSIS*

MORTAR ANALYSIS

Methodology:

The dry sample was milled with a mortar and pestle, and then wetted in a 600 ml beaker with a dilute solution of hydrochloric acid to dissolve all calcareous binder. While in the beaker, the solution was levigated to separate the non-calcareous materials into sands and fines. Decanting the solution through filter paper captured the fines while leaving the sands in the beaker. Separated sands and fines were then dried, weighed, and graded. Finally, both dry sample and separated components were evaluated under a stereo-zoom microscope.

Results of the analysis are characterized on the attached spreadsheet.

Discussion of Results:

The sample displays most of the characteristics of a natural mortar, although the qualities of the fines and filtrate suggest it may have been gauged with a natural cement. As distinct from the modern Portland cements, which were just coming into common use in the late 19th century, natural cements such as Rosendale were well established at that time, although they have since been entirely displaced by Portland cements. Natural cements offered the advantage of hydraulic setting, which was more rapid than obtainable with straight lime-sand mortar mixes.

The sands contain a very broad range of grain sizes, and are more sub-rounded in shape than sub-angular. They are characterized by numerous dark grey rock inclusions that impart a variegated or peppered appearance.

Repointing Mortar Mix Design:

The design for a repointing mortar mix should match the physical characteristics of the sample as closely as possible, in order to be visually and mechanically compatible with surviving historic materials. The most important considerations would be to use a calcareous (lime) binder, and to match the properties of the aggregate (sand) in size, color, and grading.

While an exacting restoration would demand the use of a natural cement to gauge the mortar, the work at hand can tolerate the limited substitution of modern materials. The binder should thus incorporate white Portland cement and type S hydrated lime. Use of white Portland cement allows closer matching of historic visual properties, and introduces relatively fewer soluble salts into the wall than gray Portland cement. A mortar mix in the range of an ASTM Type O would be mechanically compatible with the existing stone masonry, providing adequate strength and durability.

Because the sand is volumetrically the most significant component of a mortar mix, it likewise imparts the greatest impact on appearance. The success of matching the appearance of an historic mix thus relies heavily on matching the qualities of the original sand. The sand originally used in the Hildreth House mortars incorporates an abnormally broad range of particle sizes, and is very unlike the types of well-graded sands currently marketed by building materials suppliers for use in modern mortar mixes. Thus, procuring an appropriate sand for this work may necessitate a diligent search of local suppliers for a product matching the sample of original sand furnished with this report. Alternatively, a reasonable approximation of the original sand can be obtained by site mixing of two different sand products currently available in bag or bulk from George Schofield Company, Inc., a major regional supplier.

The recommended formula for the replication mix is as follows:

> 1 part white Portland cement, + 2½ parts Type S hydrated lime, + 7 parts sand,
> + 1/16 part Burnt Umber pigment

Proportions are by volume, and should be carefully mixed by accurate measure (not by bag or shovel). No additional admixtures should be used.

The sand is comprised of a 1:1 mix of #125 sand and #124 sand as furnished by George Schofield Company, Inc. of Bound Brook, New Jersey. The Burnt Umber pigment is from the Rainbow Dry Color series of powdered pigments produced by Empire Blended Products, Inc. of Bayville, New Jersey.

Installation Considerations:

Components may be mixed dry, prior to adding water. Care should be taken to not over-water the mix, as laitance and shrinkage will eventually result. Due to inclusions of large particles in the sand, the pointing mix will be difficult to work, but adding water merely to increase workability should nevertheless be avoided. Excessive tooling with metal pointing keys will also produce surface laitance, and impair good color matching. No acidic cleaners should be used following pointing installation, as these may adversely affect the pigment.

Because numerous areas of masonry have previously been repointed with inappropriate and poorly matched mixes, it is likely that installations of the specified replication mix will appear at odds with these if any are adjacent. For this reason, expanding the boundaries of new repointing work to coincide with natural demarcations (such as corners or edges of window or door openings) might be considered.

APPENDIX C: *PAINT ANALYSIS*

PAINT ANALYSIS

Introduction:

In order to assess the extent of surviving paint history on the Hildreth House exterior, and the feasibility of future detailed analysis and development of documented historical color schemes, a limited paint evaluation was undertaken.

Methodology:

Samples approximately 3 mm x 10 mm in size were removed from respective surfaces by means of a scalpel. Where possible, samples were obtained with traces of substrate in order to maintain proper orientation during analysis and to confirm the earliest extant layer. Samples were evaluated under a stereo-zoom microscope using magnifications ranging from 10 X to 60 X. Extant layering was noted and recorded in the accompanying chart of chromo chronologies. The earliest extant layers were matched to current Benjamin Moore colors.

Sample Notes:

Sampling protocol was predicated on locating specific examples of exterior body and trim elements that were known or strongly suspected to be original to the house. Ideally, these elements would be located in protected areas that would acquire greater build-up of layers and be less affected by deterioration due to weathering. Samples were obtained from wall shingles, door and window casings, and exterior blinds.

Determining likelihood of originality of trim elements was based upon respective molding profiles and nail types. For exterior blinds, judgment was based upon construction details and hardware, although attributions for removable elements such as these are inevitably less certain. Wall shingles proved the most difficult, as heavy weathering limited evaluation of dimensional information and sawing techniques. For these, reliance could only be placed on observing nail types, where they were exposed by previous damage. Unweathered shingles survive in large number on walls protected by veranda roofs, however many of these appear to be replacements, and nail evidence (owing to their good condition) is inaccessible for study.

Sample P001: Removed from weathered wall shingle on east face of east veranda parapet wall. Pre-existing damage revealed the nailings, which confirmed originality. Surviving paint evidence was deteriorated, friable, and poorly adhered.

Sample P002: Removed from weathered wall shingle adjacent to second story doorway on west balcony. Nailing was not accessible. Surviving paint evidence was deteriorated, friable, and poorly adhered.

Sample P003: Removed from first story Palladian window casing on east veranda. In spite of the protection afforded by the east veranda roof, the sample was deteriorated and friable, although better adhered.

Sample P004: Removed from second story door casing on west balcony. The back band of this casing displayed heavy build-ups in its crevices, and the area was likely protected on occasion by the removable awning.

Sample P005: Removed from a first story exterior blind on the south veranda. Here, the protection afforded by the south veranda roof was effective, and numerous paint layers survive.

Discussion of Results:

Owing to the general poor condition of painted surfaces on the building, good quality samples were generally not obtainable. In nearly all, paint layers were heavily deteriorated and extremely friable. Chromo chronologies of samples P001-P004 indicating the various painting campaigns could be correlated to one another as suggested by the chart, as the layers shown in horizontal alignment with one another from sample to sample are quite similar. Unfortunately, not all layers survive on all samples, and only the most recent layer survives on the two shingle samples. Correlating the painting campaigns with the layers on P005 would be tentative at best because blinds were normally removed for painting and thus didn't receive the overlaps from adjacent body or trim paint applications that might otherwise serve as reference points. Moreover, painting of blinds was sometimes conducted on a more frequent schedule than normal walls and trim, due to their complex and vulnerable joinery.

Although not within the scope of this report, a more exhaustive search of the respective exterior surfaces may produce samples that provide clearer chromo chronologies. This would necessarily involve extracting and evaluating samples from several dozen sites on the building, with enough redundancy to compensate for individual samples having poor quality or anomalous information. Ideally, such as study would be conducted in conjunction with an Historic Structure Report because the understanding of the building's evolution and maintenance provided by the latter would lend greater meaning to the paint analysis results.

Conclusions:

The earliest layering observable on trim elements is a light cream, similar to an HC-6 Benjamin Moore (BM) formulation. Although not apparent in either of the shingle samples studied, a similar highly weathered light cream is barely discernable on the easterly shingled wall surfaces of the south elevation second story octagonal bays. On the other hand, the most recent color scheme is also monochromatic with respect to wall surfaces and trim, being the light gray throughout, similar to BM AC-27. By contrast, exterior doors and blinds were generally painted in the green ranges, the earliest similar to a BM Essex Green. Whether window sashes were also a contrasting color originally was not confirmed, however in the most recent scheme they were treated similarly to the trim.

If it were desired to reinstate an early 20th century paint scheme on the Hildreth house, then a light cream paint could be used for sashes and trim, and an opaque stain formulated to the same color applied to the wall shingles. Exterior blinds and doors would thus be painted the Essex

Green. This would be with the understanding that although the palette was commonly used in the period, the specifics of its historical application is not strictly documented, but only suggested.

Otherwise, the existing light gray color scheme also has a long association with the house, and it was also popular during the early 20th century. Therefore, it would be perfectly valid to perpetuate the scheme, again using paint for the sashes and trim, and opaque stain of the same color applied to the wall shingles.

Note that during the 19th and early 20th centuries, painting of wood roof shingles was commonplace, and colors selected for those took into consideration the building's overall color scheme. Because the substitution of modern asphalt shingles in lieu of wood removes a measure of control from this element of the overall palette, asphalt shingle colors should be carefully selected with the intended painting scheme in mind. As an example, if the light cream palette were selected, an appropriate choice for the roofing materials would be the Burnt Sienna, Heather Blend, or Shenandoah colors noted in *Appendix D - Materials Recommendations*. Alternatively, if the gray palette were selected, appropriate roofing material choices would be the Moiré Black or Charcoal Black colors also noted in *Appendix D*.

CHROMO CHRONOLOGY OF SAMPLES

Sample	**P001**	**P002**	**P003**	**P004**	**P005**
Element	**Wall Shingle**	**Wall Shingle**	**Window Casing**	**Door Casing**	**Exterior Blind**
Location	*East Veranda*	*West Balcony*	*East Veranda*	*West Balcony*	*South Veranda*
Layering	Wood Substrate	Wood Substrate	Wood Substrate	Wood Substrate	Wood Substrate
			Light Cream (traces)	Light Cream (traces)	Dark Green
				White Primer	Bright Green
				Light Gray	
					Very Dark Green
			Medium Gray	Medium Gray	Dark Gray
					Very Dark Green
					Forest Green
					Medium Gray
					Forest Green
					Dark Green
			Heavy Dirt Layer	Heavy Dirt Layer	
	Light Gray	Light Gray	Light Gray	Light Gray	Blue-Green

APPENDIX D: *MATERIALS RECOMMENDATIONS*

MATERIALS RECOMMENDATIONS

The following list of materials is offered to further clarify the intent of the report narrative. Although many of the following items are generic, a few have been referenced by manufacturer and model in an attempt to more efficiently establish necessary salient characteristics and qualities. Comparable items are likely to be available from different manufacturers than those listed. It should be kept in mind that ultimate success in meeting the intent of the report recommendations depends on numerous factors beyond the materials that are utilized. These include, but are not limited to, the details of the designs and specifications that are developed to implement them, as well as the knowledge and skills of the contractors that are selected to perform the installations.

Masonry Mortars, Grouts, and Sealant Materials:

Bedding and Pointing Mortar:
Refer to formulation noted in *Appendix B – Mortar Analysis*.

Paving Joint Grout:
One part Type S Hydrated Lime + one part mason's sand, dry mixed by volume, brushed dry into raked and cleaned joints, then dampened and covered to cure.

Pipe Sleeve Sealant:
One-part moisture-curing polyurethane, such as *Dymonic*, manufactured by Tremco, Inc.

Roofing and Sheet Metal Materials:

Lead Sheet Metal Flashing:
Milled lead sheet or roll, 3 pounds per square foot weight, soft temper.

Copper Sheet Metal Flashing:
Cold-rolled copper sheet, lead coated, 16 ounces per square foot weight, meeting the standards of ASTM B370.

Lead Coated Copper Sheet Metal Flashing:
Cold-rolled copper sheet, lead coated, 16 ounces per square foot weight, meeting the standards of ASTM B370 and ASTM B101.

Conductor Stock:
Round corrugated galvanized steel, matching gauge and dimension of existing, and meeting the standards of ASTM A525.

Bituminous Polyethylene Membrane:

Self-adhering membrane furnished in rolls up to 36” in width, such as *Ice & Water Shield* manufactured by WR Grace & Co.

Roll Roofing:

Mineral-surfaced modified bitumen rolls, such as *Flintlastic SA,* manufactured by CertainTeed Corporation.

Asphalt Roofing Shingles:

Architectural laminated, minimum 300 lbs per such as *Independence (in Burnt Sienna, Heather Blend, or Charcoal Black),* or *Landmark TL (in Burnt Sienna, Shenandoah or Moire Black),* manufactured by CertainTeed Corporation.

Wood Cladding and Trim Materials:

Wood Wall and Soffit Shingles:

Western Red Cedar, No. 1 Certigrade Blue-Label, 100% edge grain, 100% heartwood, resquared and rebutted, in dry condition. Furnish in 16 inch lengths, with 5/16 inch to 3/8 inch squared butts. Widths may range from 2 inches to 9-1/2 inches. Custom size soffit shingles as required to match local conditions.

Balustrade and Parapet Cap Stock:

C-Select kiln-dried vertical grain Cypress or Mahogany, 15% maximum moisture content, furnished in dimensions and profiles matching original historical materials. No laminated, glued-in-width, or finger-jointed material is permitted.

Wood Trim Stock:

C-Select vertical grain Eastern White Pine or Idaho White Pine, 15% maximum moisture content, furnished in dimensions and profiles matching original historical materials. No laminated, glued-in-width, or finger-jointed material is permitted.

Veranda and Balcony Floor Decking:

Douglas Fir, vertical grain, all clear without knots, S4S, furnished in dimension and profile matching existing materials in respective locations to be infilled.

Balcony Floor Sleepers:

Pressure treated Southern Yellow Pine, S4S, select structural, 19% maximum moisture content.

Epoxy Consolidant:

Two-part (equal ratio) medium viscosity formulation, such as *Liquid Wood*, manufactured by Abatron Inc.

Epoxy Filler:

Two-part (equal ratio) paste, such as *Wood Epox*, manufactured by Abatron Inc.

Finish Materials:

Corrosion Passivator:

Paintable conversion coating, such as *Rust Conversion Coating M84*, manufactured by Benjamin Moore & Co.

Zinc Rich Primer:

Premixed liquid organic zinc compound containing at least 95% metallic zinc by dry film weight, such as *ZRC Cold Galvanizing Compound*, manufactured by ZRC Worldwide.

Borate Preservative:

Disodium Octaborate Tetrahydrate such as *Bora-Care* concentrate, manufactured by Nisus Corporation.

Wood Caulking:

Paintable elastomeric latex sealant, such as *Dynaflex 230*, manufactured by DAP, Inc.

Acrylic Latex Primer and Paint System:

For painting ZRC-coated conductors and areaway frames, acrylic latex primer and paint system, such as *Acrylic Latex Primer*, and *Latex High Gloss Metal and Wood Enamel*, manufactured by Benjamin Moore & Co.

Alkyd Opaque Stain System:

For painting cedar wall shingles, alkyd primer and stain system, such as *Fast Dry Alkyd Primer*, and *Solid Color Exterior Alkyd Stain*, manufactured by Benjamin Moore & Co.

Alkyd Paint System:

For painting doors, sashes, blinds, and trim, alkyd primer and paint system, such as *Moore's Alkyd Exterior Primer*, and *Moore's Gloss House Paint*, manufactured by Benjamin Moore, & Co.

APPENDIX E: *EXISTING CONDITIONS DRAWINGS*

APPENDIX F: *TREATMENT LOCATIONS DRAWINGS*