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**Report of Site Visit**

TO: Wayne Goodman, Executive Director
Landmark Society of Western New York
133 South Fitzhugh Street
Rochester, New York 14608

RE: October 12, 2011, Site Visit,
Clarendon Stone Store

ATTACHMENTS:

1. The Secretary of the Interior's "Standards for Rehabilitation" (December, 2002).
2. Floor Plan Sketches, November, 2011, Bero Architecture PLLC.
3. DRAFT National Register Nomination form, Erin Anheier, 10/31/2011.
4. Some Thoughts on New York State Building Codes, Bero Architecture PLLC.
5. Historic Photos, courtesy of Melissa Ierlan, Clarendon Town Historian.
6. Tax Map showing the site and building approximately to scale.
7. Indenture describing the site dated December 17, 1979.
8. Site Boundaries Plot, Bero Architecture PLLC.
9. Sketch of the sewage disposal system, Micah Eldridge, 10/19/2009.
10. Some Thoughts on Rehabilitation Tax Credits, Bero Architecture PLLC.
11. Rafter Thrust Diagrams, Bero Architecture PLLC.
12. Some Thoughts on Stormwater Management, Bero Architecture PLLC.
13. Preservation Brief 2: "Repointing Mortar Joints in Historic Masonry Buildings," National Park Service, 6/23/2008.
14. "Chimney Flashing," SMACNA Architectural Manual—3rd Edition, pp 28,29.
15. Glossary, Bero Architecture PLLC.

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# 1 SUMMARY

## 1.1 Purpose

The Clarendon Stone Store is owned by the Town of Clarendon which has not found a use for it. Its architectural and historic importance is recognized by its eligibility for listing on the National Register of Historic Places. Concerned citizens wish to save the building. Accordingly the Town has agreed to temporarily suspend demolition to allow the building to be marketed. This report is intended to describe the building, summarize its condition, and suggest remedial work.

This report was funded in part by the Landmark Society of Western New York at the behest of Clarendon citizens organized as the Clarendon Stone Store Preservation Committee.

## 1.2 Method

Site observations were made by John Bero on October 12, 2011. Erin Anheier arranged the site visit and access to the building. Melissa Ierlan, Town Historian and Code Enforcement Officer, contributed photographs, historic information, and personal knowledge to the report. Erin and Melissa walked through the building with me. Bob Frieda provided a fire department ladder truck for access to the roofs. The day was cloudy and cool with heavy rain in the late afternoon.

The interior and exterior were surveyed. Photographs documenting observations are included in the report. The Secretary of the Interior's "Standards for Rehabilitation" are used as the basis for recommendations (please refer to Attachment 1).

## 1.3 Arrangement

This report consists of this *Summary*, a *General Comments* section dealing with issues needing explanation beyond that provided by worklist notes, a *Worklist* prioritizing suggestions for repairs and improvements together with notes and photographs, and, finally, *Attachments* including technical supplements. Recommended work items are generally grouped by construction trade.

## 1.4 Limitations

The survey was visual, areas concealed from view were not opened or uncovered; no finishes or trim were removed. This is a brief report, not an Historic Structures Report or a Condition Report, rather a brief overview of present conditions. The site visit and report are by an architect; readily visible mechanical and electrical systems were surveyed with an "architect's eye" but no engineers examined the structural, mechanical (plumbing and heating), or electrical systems.

The report is focused on maintenance and repair of the building. It is assumed use and configuration will change so there are no comments regarding interior finishes beyond general cautions as to potential presence of hazardous materials.

## 1.5 Nomenclature

For building plan sketches showing nomenclature used in this report please refer to Attachment 2. See also the Glossary, Attachment 15.

## 1.6 Summary of Findings

The building is nationally significant as evidenced by its National Register eligibility. In addition, it is locally significant because of its prominent location: it dominates and terminates the view of the four corners from the south. Its loss will fundamentally change the hamlet by replacing the primary historic landmark defining the intersection and the heart of the settlement with a view of the gas station/convenience store.

Neglect and improper repairs have lead to its present bedraggled appearance. The building appears fundamentally sound although the roofs need to be stiffened and there has been is minor foundation movement at the northwest corner of the stone portion which should be relatively easy to stabilize.

The building is unique to the Hamlet but has many of the characteristics of the popular styles of the times. It was beautiful when built and can easily be returned to its former beauty. Feasibility of reuse might be increased by drying the basement and using it for income-producing purposes.

The report includes a worklist of recommended work items. A three-tiered ranking system is used to prioritize each item. Priorities are assigned based on a work item's importance: Priority 1, essential; Priority 2, preservation; or Priority 3, optional. Priority 1 recommendations are very few; they deal with structural stability and safety and should be implemented as soon as possible. Priority 1 recommendations include:

Structure
- Investigate structural strength of north section roof framing and deck
- Repair broken purlin in south attic
- Repair cracked purlin connections in south attic

Personal safety
- Repair roof deck at broken board
- Repair railings at west stair and porch
- Replace basement stair
- Reinforce handrail at north porch
- Repair east railing at east porch
- Provide rail at steps descending from east porch

Even if the building is unoccupied, the roof purlin in the south section attic should be repaired, preferably before winter. I also urge analysis of the north section roof as soon as possible to determine its load capacity.

# 2 GENERAL COMMENTS

## 2.1 Description

The building consists of two sections. The south section was constructed of local Medina sandstone in 1836 with a simple rectangular footprint and a narrow front gable facing Route 31A to the south. It is two stories high plus a full-height basement. The north section, wood-framed and two stories high over a crawl space, matches the width of the south section and extends north about 17½ feet. For a detailed description please refer to the draft National Register of Historic Places Nomination Form (Attachment 3).

Figure 1: View from the southwest

Figure 2: From the southeast

Figure 3: From the northeast

Figure 4: From the northwest

## 2.2 Code Compliance

For a general discussion of building codes please refer to Attachment 4. Code applicability to this building will depend largely on its proposed use: it has been a multiple residence building for many years; if the use changes, the building will probably be required to comply with the current building code. If the use is not to change, probably only physical changes to the

building will require compliance with the building code. This is a complex issue which can best be sorted out by discussion with the Code Enforcement Officer who has significant authority to interpret the Codes.

In Attachment 4, please take note of the section on historic buildings:

> In many circumstances certain onerous Code requirements can be waived for historic buildings by local authorities. When planning for any change requiring a building permit, you should investigate the potential advantages of being declared an historic building by reviewing the Codes and meeting with the local Code Enforcement Officer.

There are Code advantages to having the Stone Store declared an historic building. This can be done at the state and national level, or by local authorities.[1]

## 2.3 Durability of repairs

Recommendations in this report are generally for long-lived repairs. Often the reaction of contractors to this type of recommendations is, "We don't do it that way," or, "It's not done that way," or "Nobody does it that way any more." Interpret a contractor's comments as his or her way of telling you either they don't know how to follow the recommendations, or they will be uncompetitive if they follow the recommendations. Contractors are generally under pressure from owners to reduce first costs as much as possible, and are most comfortable with conventional materials and techniques they are used to; because of prevailing marketplace conditions most of their jobs must use low first cost, short life expectancy solutions. You are not a conventional commercial client, your primary goal is to the preserve the building, so if you get the "Nobody does it that way anymore." response from a contractor, continue searching for contractors who are comfortable with the recommendations and are used to doing high-quality work.

Be careful where you get advice. Contractors usually recommend building repairs using tools and materials they are used to. For example, a roofer who doesn't normally repair slate roofs will recommend patching a leaking slate roof with roofing cement and replacing it with relatively short-lived asphalt shingles long before replacement of the slate is warranted. A roofer who doesn't have mechanics who can do flat-seam metal work will never think of recommending flat-seam metal roofing, even though it may be the most historically appropriate and cost-effective roofing. Similarly, a contractor used to replacing wood windows with vinyl windows will recommend replacement when repair of the wood, by the proper contractor with the proper skills, will cost half as much as vinyl and wood windows will last many times longer than vinyl. Many similar examples can be given: select your advisors carefully. The measures of quality are not the same for all building owners; correct solutions to building problems are not universal.

## 2.4 Restoration

When built, the Stone Store building was a handsome structure. Over the years modifications have been made with no attention to aesthetics with the result that it is now hard to discern

1 *Existing Building Code of New York State*, 2010, Section 202, General Definitions, "Historic Building.".

beauty in the building which remains. Its original beauty can be recovered: the best way is to restore, to the extent feasible, its original appearance. To that end, historic photographs are included as Attachment 5. Notable exterior features negatively affected by modern work include the storefront, porch, and site grading. All can be restored and are included on the work list in Section 3.4.12.

## 2.5 Site Conditions

No property survey map was available so both the shape of the property and location of the building on the site are unknown. Attachment 6 is a copy of the tax map with a sketch of the building footprint added to indicate scale of the building in relation to the property. The building is shown, for illustrative purposes only, 10 feet from west and south property lines. The tax map does not agree well with the description of the lot in the Indenture I was given (Attachment 7). Shape of the lot as described in the Indenture (Attachment 8) is more complex than shown on the tax map. This is not unusual because tax maps are often simplified but there appears to be a significant closure error in the Indenture description, and some property along the northeast boundary may have been sold off since 1979. From site discussions it is likely the building is close to the west property line, that is how the footprint is shown on Attachment 6, but actual dimensions are not known so no comments on compliance with zoning dimensional requirements can be made. I have no copy of the Zoning Ordinance so no comments on use limitations can be made; queries should be directed to Town officials.

The building reportedly is supplied water from a municipal source. A storm sewer is reported to be installed beneath State Route 31F. This storm sewer may be of use if the State allows the owner of this property to tap into it. If not, it may be possible to dispose of stormwater at the north end of the site but topography and legal implications are unknown.

No municipal sanitary sewer serves the site. Attachment 9 is a sketch of the septic system. It is my understanding the system will be inspected by the County Health Department to determine its capacity.

## 2.6 Tax Credits

Significant tax credits are offered for by State and Federal governments for certified restorations of historic buildings. This building is eligible. Potential tax credits will be larger if the building is listed in the National Register of Historic Places, the nomination for which is being prepared by Erin Anheier (Attachment 3). For a general discussion of rehabilitation tax credits please refer to Attachment 10. In order to obtain tax certification of a restoration it must be done in accordance with the Secretary of the Interior's "Standards for Rehabilitation" (Attachment 1) as determined by the State Historic Preservation Office (SHPO). The key to getting certification is to contact the SHPO before starting and follow the rules to the letter. The result will be a taxpayer-assisted rehabilitation in accordance with the standards of the preservation community.

# 3 WORKLISTS

## 3.1 Work items

Recommendations are intended to comply with the Secretary of the Interior's "Standards for Rehabilitation," Attachment 1. These are ten succinct standards which have become helpful guidelines for anyone caring for an historic structure. Compliance with these standards is mandatory when using governmental funds for maintaining or improving any building. Compliance is monitored by the National Park Service and the SHPO[2].

## 3.2 Arrangement of the Lists

In the worklists, work items are generally grouped by construction trade. Where an explanation and/or illustration of an item is deemed necessary, explanatory notes and/or photographs follow in Section 3.5 .

## 3.3 Priorities

Recommendations are prioritized as follows:

1. Essential: Life safety and immediate stabilization
2. Preservation: Work which can be deferred, but is required for long-term stabilization and longevity of building and collections
3. Optional: Restoration of historic detail, optional improvements/upgrading, and planning/administration

Priorities were assigned, without knowledge of available funds, on the basis of an item's importance as it relates to occupancy and preservation of the property.

## 3.4 Recommended Work Items

| Worklist items | Notes | Priorities | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| 3.4.1 General | §3.5.1 | | | |
| Obtain survey showing property and building | 1. | | 2 | |
| Remove section of vinyl siding, investigate concealed siding | 2. | | 2 | |
| Investigate alignment of vinyl-clad wood-framed walls | 2. | | 2 | |
| Inspect crawl space beneath north section | 3. | | 2 | |
| Investigate structural strength of north section roof framing and deck | 4. | 1 | | |
| Monitor crack at NW corner of stone section | 5. | | 2 | |

2 The SHPO (ship-o) is the State Office of Historic Preservation, a Federally mandated state agency. In New York the SHPO is the Department of Parks, Recreation, and Historic Preservation.

| Worklist items | Notes | Priorities 1 | 2 | 3 |
|---|---|---|---|---|
| Investigate asbestos, lead and other hazardous substances | 6. | | 2 | |
| Investigate mold | 7. | | 2 | |
| | | | | |
| 3.4.2 Site | §3.5.2 | | | |
| Determine capacity of sewage disposal system | 1. | | 2 | |
| Remove paving adjacent to east and west walls | 2. | | 2 | |
| Provide window wells at west basement windows | 3. | | 2 | |
| Adjust grade to slope away from east and west sides of building | 4. | | 2 | |
| Regrade beneath east porch to drain properly | | | 2 | |
| Regrade at north wall to drain properly | | | 2 | |
| Provide underground stormwater disposal system | 4. | | | 3 |
| Provide french drain parallel to west wall | 5. | | | 3 |
| | | | | |
| 3.4.3 Stormwater Disposal | §3.5.3 1. | | | |
| Replace gutters on north section | 2. | | 2 | |
| Replace “K” gutters with half-rounds on south section | 2. | | | 3 |
| Provide strainers at all gutter outlets | 3. | | 2 | |
| Replace downspouts, rearrange to eliminate dumping from one to another | 4. | | 2 | |
| Provide splashblocks at base of downspouts | 5. | | 2 | |
| OR | | | | |
| Connect downspouts to underground disposal system | 5. | | | 3 |
| | | | | |
| 3.4.4 Masonry | §3.5.4 1. | | | |
| Repair chimney, provide cap | 2. | | 2 | |
| Investigate curb at base of west wall, repair with fieldstone as needed | 3. | | 2 | |
| Repoint Medina ashlar (cut stone) | 4. | | 2 | |
| Reconstruct southwest corner of foundation, repoint remainder | 5. | | 2 | |
| Add ventilation to crawl space | 6. | | 2 | |
| Reconstruct wall above large east window | 7. | | | 3 |

| Worklist items | Notes | Priorities | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| | | | | |
| 3.4.5 Roofing | §3.5.5 1. | | | |
| Improve flashing at chimney | 2. | | | 3 |
| Replace roofing at porch roof as required by structural repairs | 3. | | 2 | |
| | | | | |
| 3.4.6 Carpentry | §3.5.6 | | | |
| South Section | | | | |
| Repair railings at west stair and porch | 1. | 1 | | |
| Reinforce floor of west porch | 2. | | 2 | |
| Repair broken purlin in south attic | 3. | 1 | | |
| Repair cracked purlin connections in south attic | 4. | 1 | | |
| Repair roof deck at broken board | 5. | 1 | | |
| Restore missing pieces of cornice | 6. | | 2 | |
| Repair cornice returns at south wall | 7. | | 2 | |
| Repair fence at trash enclosure | | | | 3 |
| Insulate basement perimeter walls | | | | 3 |
| Provide roof over exterior stair | 8. | | | 3 |
| North Section | | | | |
| Improve roof framing and deck | 9. | | ? | |
| Improve ceiling framing above second floor | 9. | | ? | |
| Replace basement stair | 10. | 1 | | |
| Reinforce handrail at north porch | 1. | 1 | | |
| East porch | | | | |
| Replace rotten joists and deck at east porch roof | 11. | | 2 | |
| Repair east railing at east porch | 1. | 1 | | |
| Provide rail at steps descending from east porch | | 1 | | |
| Replace west fascia | 12. | | 2 | |
| Restore and re-secure aluminum soffit trim at east soffit | | | 2 | |
| OR | | | | |
| Remove cladding, restore wood trim | 13. | | | 3 |

| Worklist items | Notes | Priorities 1 | 2 | 3 |
|---|---|---|---|---|
| Remove vinyl siding, restore wood siding | 14. | | | 3 |
| Repair first floor framing | 15. | | 2 | |
| Cover crawlspace floor | 16. | | 2 | |
| Ventilate crawlspace and insulate | 17. | | 2 | |
| | | | | |
| 3.4.7 Windows | 3.5.7 | | | |
| Replace basement windows | 1. | | 2 | |
| Repair and make operable first and second floor windows | | | 2 | |
| | | | | |
| 3.4.8 Doors | §3.5.8 | | | |
| Replace front door | | | | 3 |
| Replace basement access door | 1. | | 2 | |
| Restore other exterior doors | | | | 3 |
| | | | | |
| 3.4.9 Mechanical | §3.5.9 1. | | | |
| Test sump pump, replace if necessary | | | 2 | |
| Test plumbing, repair/replace as needed | | | 2 | |
| Test heating system, repair/replace as needed | | | 2 | |
| | | | | |
| 3.4.10 Electrical | §3.5.10 1. | | | |
| Inspect electrical system | 2. | | 2 | |
| Make repairs as needed to comply with National Electric Code | 2. | | 2 | |
| Improve panel grounding at west wall | 3. | | 2 | |
| Remove exterior wiring, relocate to interior | 4. | | | 3 |
| | | | | |
| 3.4.11 Other | §3.5.11 | | | |
| Remove basement room | 1. | | 2 | |
| Remove debris from attics | 2. | | 2 | |
| Salvage building remnants (window sash) from north attic | 3. | | | 3 |

| Worklist items | Notes | Priorities | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Clean up foam filler at bottom of cornice | | | | 3 |
| Replace indoor-outdoor carpet at west porch | 4. | | 2 | |
| Repair and refinish gable fan | 5. | | 2 | |
| Cover attic hole in north chimney with screening | 6. | | 2 | |
| | | | | |
| 3.4.12 Potential Restoration | §3.5.12 | | | |
| Restore grade at south wall, provide wing wall at SE corner if preferred | 1. | | | 3 |
| Restore south facade | 2. | | | 3 |
| Restore front porch | 3. | | | 3 |
| Restore windows and shutters (blinds) | 4. | | | 3 |
| Restore chimneys | | | | 3 |
| Reconfigure interior | 5. | | | 3 |

## 3.5 Notes on Worklist Items

### 3.5.1 General

1. A survey is required in order to plan repairs and restorations outside the footprint of the building including site grading, sewage disposal, restoration of front porch, etc. A surveyor is experienced in resolving the discrepancies noted in Attachment 8 and discussed in Section 2.5

2. Vinyl siding is deteriorated and should be replaced. Often we have found original clapboards which can be restored beneath modern siding. Original clapboards often have remaining lives many times longer than new artificial sidings.

3. I did not get into the crawlspace but recommend wood structural members including joists and sills be probed to look for deterioration. (Please see also Section 3.5.6, Note 15.

4. The thrust from roof rafters is usually restrained by ceiling joists or collar ties (Attachment 11). When ceiling joists or collar ties are absent, ridges tend to sag and eaves to spread. In some cases this does not afford enough restraint, typically because joists are missing or the joint between rafters and joists is inadequate.

   The north section has a sagging ridge and some bulging of the exterior walls: restraint of rafter thrust is probably inadequate. (This does not appear to be an issue on the south section.) Because of observed deflections and bounce of the roof when walked

on, engineering analysis is considered a high priority item. Urgency of repairs (listed under Carpentry) will not be known until the analysis is done.

Figure 5: The ridge on the north section has a notable sag. This photo also shows the belly in the rafters.

Figure 6: North section eaves bow outward in the center of the wall.

5. I was unable to account for the masonry crack at the northwest corner of the south section. It indicates mostly horizontal movement. This, together with the curb added against the outside of the west wall (Figure 9), indicates movement may have been caused by water saturation of soil against the foundation wall. The crack itself is not dangerous; if it increases over time, repairs are called for to stabilize the foundation.

Figure 7: Crack at the NW corner of the south section. View from the north section.

Figure 8: Growth on walls in basement room.

6. Many existing buildings contain hazardous materials and abatement can represent a significant expense. It is best to investigate the existence of hazardous materials at the beginning of a project. New York State labor laws require an asbestos survey be conducted, and an abatement plan instituted, as a part of any construction project affecting an existing building. Bero Architecture PLLC has no expertise in the identification, treatment, repair, or removal of lead or asbestos-containing products;

mold, mildew, fungi, or other biological dangers; or other hazardous or toxic materials. It is recommended an independent expert consultant be hired to confirm the presence of hazardous materials, recommend abatement options, and estimate costs

7. A black growth, perhaps mold, is visible on walls in the basement room (Figure 8). An expert should be consulted to determine if it is hazardous and, if it is, its extent and recommended clean-up methods.

3.5.2 Site

1. Please refer to Section 2.5 .

2. Paving against the west wall is level and so allows water to flow toward the wall. Paving against the east wall has a slight slope away from the building (about 1/8$^{th}$ inch per foot) but is not useful and interferes with improving the slope of the grade.

Figure 9: Curb and paving at base of west wall.

Figure 10: Paving at base of east wall.

3. Wood window sills should be at least eight inches above grade so before you add fill to the base of the west wall, I suggest you install window wells. (You will need two if basement windows are restored as suggested.) Window wells are almost completely concealed so they can be made of any material you like. Historically, they were of stone, often dry stacked. Today they are often plastic. An intermediate choice, in terms of quality, is an inexpensive galvanized steel form. I recommend digging to 16” below sills, installing window wells and then putting 8” of granular material such as gravel or crushed stone in the bottom of each well so water will percolate into the surrounding soil.

Figure 11: Buried basement window.

Figure 12: Blocked basement window from inside.

4. The most upsetting issue to a potential buyer is apt to be the water in the basement. During my visit water depth varied from none to two or three inches. A high priority for anyone selling or buying the building is to dry out the basement. Please refer to Attachment 12 for a general discussion of site grading and the value of underground disposal systems.

   The earth slopes down to this building from the west. Water running toward the building must be diverted or collected. The soil is low adjacent to the west wall at some places. That this is a chronic problem is suggested by the concrete curb and foundation patch found along the base of he west wall. Whatever remediation was attempted in the past, it is presently inadequate. The easiest way to correct this is by adjusting the surface. Prior to adjusting the grade you should add window wells as discussed in Note 3, above. Then, by adding a few inches of topsoil in low areas, you can correct the grade to divert water.

   If grading adjustment impinges on your neighbor's land, and if your the neighbor is not willing to let you make this improvement, you will have to find an alternate means of intercepting the water. This is usually done by digging a diversion trench along the side of the foundation in accordance with Note 5. below.

5. You may wish to intercept water running down the hill from the west with a collection trench (French drain). These are usually a couple of feet deep and filled with course gravel or crushed stone. If one side of the trench is the masonry foundation, parge[3] it and coat it with a dampproofing compound made for this purpose. The bottom of the trench should be sloped to daylight where water will be discharged to the surface

### 3.5.3 Stormwater Disposal

1. In my experience, much water in basements comes from roofs; I believe that to be the case here. In addition to making minor grading changes, we have had good results drying out basements by making low tech improvements to the rainwater disposal

3 Parging is cement plaster applied to a wall, filling cracks and providing a smooth surface suitable for applying dampproofing.

system. A good rainwater disposal system consists of gutters to collect the water, downspouts to lead it to grade, and a method of directing water away from the building at the discharge point. The present system consists of gutters which are over-long and under-sized, and which empty from one to another, disconnected or missing downspouts, and direct discharge against foundation walls. Please refer to Attachment 12 for a general discussion.

2. At the north section, aluminum "K" gutters are attached with spikes and ferrules. These gutters are loose and will fall off before long; they should be replaced with a better system. "K" refers to the shape; a more appropriate shape for this building is half-round; note the interesting gutters (and lack of downspouts) in Historic Photo 3 in Attachment 5. Gutters should be replaced using better hangers than spikes and ferrules.

Figure 13: Spikes and ferrules inevitably fail.

Figure 14: Spikes cause the fascia to rot. An open fascia may eventually admit bats and other vermin into the attic.

3. Strainers prevent a common sequence: a downspout is clogged, often by leaves or a dead pigeon, water is trapped, freezes, and the downspout splits at the back seam.

4. South gutters are currently arranged to dump into north gutters, a way of saving money. As evidenced by the building this arrangement doesn't work well. When gutters are replaced downspouts should be arranged so that gutters do not empty into one another; and each section should have its own downspouts.

5. Roof water often wasn't much of a problem for the original builders, typically they collected it in cisterns. Now we often dump it on the ground at the base of our buildings and find increased deterioration and dampness because of it. If you can dump your storm water into an underground system, that is the best way to get it off site and away from your foundation. If not, where downspouts reach the ground, it is important to divert the water away from the building. We recommend the use of a precast concrete splashblock at the bottom of each downspout rather than the downspout extensions often used; extensions are normally damaged or removed to permit mowing.

A better method of stormwater disposal is to connect the downspouts (through cleanout "Ts") into an underground system that takes water away from the building, either to a drywell in your yard or to the storm sewer if the State will give you access to one beneath the road. Both methods are superior to dumping water near the basement, even with the use of splash blocks.

Figure 15: The upper gutter spills into the lower. Note the missing downspout.

Figure 16: Discharge from this downspout is undermining the foundation. Discharged water probably finds its way into the basement.

3.5.4 Masonry

1. Chimney is face brick, south wall is cut Medina sandstone (ashlar), and the foundation is fieldstone. East and west walls appear to be fieldstone but, because they have been parged (coated) with a cementitious material (perhaps Thoroseal®), the type of stone was not determined. The north wall of the south section, visible from the north attic, appears to be fieldstone.

   On the east and west walls original decorative joints (tuck pointing) can be discerned beneath the coating; these walls were originally finished, not rough. The masonry appears to have been in good condition before Thoroseal was applied. Perhaps the coating was applied as a means of "waterproofing" the wall. I doubt it was required or serves any purpose but it is tenacious. Although unattractive, I suggest it be allowed to weather off. In the meantime it can be painted for cosmetic reasons if desired.

Figure 17: Old tuck pointing shows through the modern coating.

2. Chimneys typically deteriorate most where masonry joints are exposed to the weather on the top of the top course. When the chimney is repaired, the single most important preservation measure is to install a durable cap which totally covers the vulnerable top course and overhangs enough for water to drip free of the chimney below. Caps can be made out of stone, concrete, or metal. Metal can be galvanized iron or copper; we don't recommend the use of aluminum. Your mason can guide you as to options and cost. Masons are not very good at metal caps so they do not generally recommend metal and I would not have a mason build one. If you want a metal cap, have it done by a sheet metal worker.

Figure 18: The original chimney has weathered down to its present level. Compare with Historic Photo 1 in Attachment 5. Reconstruction to its historic profile and a durable cap are recommended.

Figure 19: Deteriorated curb against west wall.

3. The purpose of this curb (Figure 19) is not clear. It may have been an attempt to deflect water and in lieu of properly repairing and dampproofing the stone wall. Stormwater should be controlled by regrading and/or providing a French drain as suggested above.

If the stone wall is deteriorated or has shifted, it should be properly repaired. I suggest a hole be dug to determine depth of this curb and condition of both wall and curb. Perhaps the curb can just be left in place but exploration in this vicinity may help to explain the crack found in the north wall of the south section.

4. Repointing masonry is normal maintenance. Most of your stone walls are in good condition but some repointing is needed at the south wall. When repointing or making masonry repairs, it is important to hire contractors knowledgeable about historic masonry. Repointing is a tedious process but, when well done, lasts many decades. The contractor should understand the type of stone or masonry he is working with and custom mortar formulas that will be durable yet not harm surrounding masonry units. Each masonry unit has a unique density and exposure which require consideration when selecting mortar formulas. We caution that hard Portland cement-based mortars exacerbate problems and make future repointing difficult. Repointing mortars should always be softer than the adjacent masonry units. Soft mortar provides sacrificial joints that absorb shock and movement—repair of cracked and deteriorated joints is normal maintenance while replacement of masonry units is not. For a general discussion of the subject please refer to Attachment 13.

Figure 20: Masonry joints are generally in good condition. Most of the required work is repointing of the jack arches and the three courses above them.

Figure 21: A small amount of repair is required at this southwest corner of the south section.

5. A small section of the foundation at the southwest corner has settled because of loss of mortar (Figure 21). The corner stones above appear well supported and fairly plumb so only the foundation needs to be repaired, and only in the immediate vicinity of the corner.

6. The crawlspace beneath the north section has the same (or greater) need for ventilation as the basement (please refer to Section 3.5.7, Note 1.).

7. Although there are no obvious cracks in the lintel above the large window in the east wall, the wall is dished in this vicinity and the lintel and associated masonry repairs are unsightly. Reconstruction is not necessary, but desirable.

Figure 22: This large window replaces a narrow window which matched others on the building. It is recommended the window be restored to its original configuration when the wall is repaired.

Figure 23: Another view of the large east window lintel and poor wall repair.

### 3.5.5 Roofing

1. Roofing on both sections is three-tab shingles in good condition. I found a few very small tears, indicative of physical abuse rather than weathering or deterioration. I estimate these shingles will last at least five more years.

Figure 24: Overall view of roofs from the south.

Figure 25: Detail of shingles. The nail should be pulled and the hole patched. These shingles are in good condition.

2. Attachment 14 shows recommended flashing and counter flashing at a typical brick chimney. The chimney on this building has aluminum counterflashing which, although fastened with exposed fasteners, appears to be doing its job. Base flashing cannot be examined because it is smeared with roofing cement. Roofing cement, roofing tar, flashing cement, and black goop are all names for asphalt-based patching compounds which are only suitable for temporary patching. These products contain sulphur which,

when exposed to rainwater, becomes sulphuric acid. Tars and asphalt patching compounds not only hide problems but may accelerate deterioration of metal flashings. I couldn't tell if your flashing is leaking now but the roof deck should be inspected from inside the attic after a hard rain to look for leaks. When the flashing requires repair, copper or galvanized steel are better for this purpose than aluminum.

3. Please refer to Section 3.5.6, Note 11.

3.5.6 Carpentry

1. There are stringent Code requirements for stair railings, including dimensions and minimum strength. Although I did not do any structural analysis I don't believe any of the exterior railings meet code structural standards. In particular, at the west stair and porch every other balustrade has been added to halve spacing between original balusters, probably to comply with required dimensions in the current code, but many of the added balusters are secured with nails or screws inadequate for their purpose. They appear sturdy but are not. The entire stair, including stringers, treads, and railings should be structurally analyzed to determine required reinforcements.

2. The porch floor was originally framed with wood too small to carry required loads. It has been reinforced, but not well, and the floor feels overly flexible. The floor should be reinforced to comply with the Building Code. See also Section 3.5.11, Note 4.

Figure 26: Inserted balusters are not properly secured.

Figure 27: Initial floor framing was inadequate; reinforcements are inadequate.

3. Purlins are horizontal members between attic trusses that support rafters at the middle of their spans. At the center of the west slope of the south roof the purlin has split at the south connection and fallen. It should be repaired, preferably before winter when the roof may carry heavy snow loads.

Figure 28: This purlin beneath the west slope of the roof has fallen.

Figure 29: The failed purlin split at the connection. A small strip, right of the beam, remains connected.

4. Typical connections at the ends of purlins are weak. Several are split, a prelude to failure. All purlin end connections should be examined and reinforced as required.

Figure 30: This is another cracked purlin connection but the purlin has not yet fallen.

Figure 31: This broken beck board leaves a hole large enough to step through.

5. At one location (Figure 31) a broken board leaves a hole where shingles are supported only by building paper. This is a safety hazard and a potential leak site.

6. A few small pieces of cornice molding are missing. Repair should be with custom-made pieces, milled to match, of cedar, redwood, or mahogany.

   The most popular woods sold today for exterior trim are poplar and pine. They are cheap, relatively free of knots and readily available. They do not endure where exposed to the weather and are a waste of money for most exterior trim. Avoid finger jointed pieces, they deteriorate at the joints. We recommend clear cedar, redwood, or mahogany (and cypress, if you can get it). For porch floors we recommend clear

tongue-and-groove 5/4" fir. We don't recommend you use other woods in locations exposed to weathering.

Figure 32: A small piece of molding at the bottom of the southwest rake is missing. The roof of the cornice return is weathered through.

Figure 33: A similar condition exists at the southeast cornice return. The corresponding piece of molding has not yet fallen.

7. Cornice returns are covered to protect them from the weather (Figures 32and 33). It appears returns on this building were protected with painted boards, a common method of the era. Those boards have worn out, exposing the back side of moldings and soffit. Repairs should be with durable woods. We further recommend covers be roofed with metal, preferably copper, secured with concealed fasteners.

8. The building code now requires an exterior stair, if used as a required means of egress, be covered with a roof. Early pictures show the stair uncovered (Historic Picture 1, Attachment 5) but one taken c. 1991 (Historic Picture 5, Attachment 5) shows it was covered later. I have listed covering the stair as a priority 3 optional improvement but upgrading the stair, including covering it, may be required by the local Code Enforcement Officer, especially if use of the building changes.

9. Please refer to comments in Section 3.5.1 Note 4. Rafters and deck flex. It is recommended they be analyzed for structural sufficiency and reinforced as necessary. I suspect minimal required work will include installation of collar ties and ceiling rafters spanning east-west (please refer to Attachment 11.) A priority for this work cannot be assigned until the analysis is done.

10. The basement stair is not repairable. It can be abandoned or rebuilt. Because it is in a damp environment I recommend only preservative pressure-treated lumber be used.

11. A leak at the southwest corner of the east porch roof has caused deck and framing to rot.

Figure 34: This little roof at the east porch is deteriorated

Figure 35: In places, both joists and deck are rotten.

12. The wood is probably common pine, damaged by spike and ferrule gutter hangers. Gutter hangers are discussed in Attachment 12; durability of wood in Note 6. above.

13. Wood trim on the north section is mostly clad with wood or vinyl. We generally do not recommend cladding wood trim although we understand that it was done to minimize maintenance. Cladding almost always allows moisture to get trapped behind it, causing hidden decay and moisture penetration into the building. Cladding wood eventually leads to its rot.

Figure 36: Covering trim obscures the style of the building and leads to deterioration of the trim.

14. Vinyl siding is not very durable compared to wood. The vinyl on the north section is detached at places and cracked due to embrittlement at others. The original wood siding may be restorable, it often is in cases such as this.

Figure 37: Vinyl siding susceptible to blow-off.

Figure 38: Typical holes in aged vinyl siding.

15. Extent of required repairs can only be determined by crawling into the space and probing joists and sills. Visible from the basement stair is the stone pier supporting the center of the floor. Note in Figure 39 the joist on the right which has fallen due to lack of support at the west end. At a minimum, this joist should be re-supported and reattached.

Figure 39: View into the crawl space from the basement stair.

16. Mold tends to grow in unventilated crawl spaces. Every measure should be taken to prevent growth of mold. Elsewhere stormwater management is discussed. Another method which will help deduce moisture in the crawl space is to provide a vapor retarder on the floor. This is usually a sheet of 6 mil polyethylene, weighted to hold it in place.

17. There are two methods of introducing air for ventilation: from the out-of-doors via openings in the foundation wall; or from the adjacent basement by openings in the shared basement wall. Because of modern concerns for energy conservation, owners often wish to add insulation to reduce heat loss through the floor above. If ventilation is introduced through the exterior perimeter wall, insulation can be added between the

floor joists, providing a cool crawl space. If ventilation is introduced from the basement, as it is presently, insulation is usually added to the crawlspace perimeter foundation wall, providing a warm crawl space. The cool crawlspace is more efficient but is not usually suitable for water pipes because of the danger of freezing.

### 3.5.7 Windows

1. The building originally had at least three operable basement windows. Basement windows are required for the health of the building. Ventilation allows the escape of humid, musty air that promotes rot, mold, and mildew and attracts wood eating insects. We recommend leaving basement windows open spring, summer, and fall to promote air and vapor movement out of a building. Screens in these windows will help protect against insect and animal intrusion. For security, you may wish to install burglar bars as well. These can be obtained at hardware stores and are simple to install. Wood basement windows close to grade should be protected by installing window wells as suggested in Section 3.5.2, Note 3.

### 3.5.8 Doors

1. The basement access door, (often called a bulkhead door) is badly deteriorated. I was unable to determine the condition of the foundation but it may require repairs before replacing the door. Today, prebuilt metal doors (Bilco® is one maker) are often used for this purpose but it may be difficult to find one which will fit the existing foundation. The least expensive alternative may be to duplicate the old door, using durable woods as discussed in Section 3.5.6, Note 6. Traditional beaded tongue & groove fir would be a good choice for the door itself.

Figure 40: Basement access door.

### 3.5.9 Mechanical

1. Mechanical systems (plumbing and heating) were not operable during the site visit.

### 3.5.10 Electrical

1. Electricity was not available during the site visit.

2. The existing electric system is old and does not comply with the current *National Electric Code*. This code has been in existence since 1896 and we assume your original wiring was installed in accordance with the version of the code in effect at the time of installation. Poorly maintained or improperly installed electrical systems are a significant hazard to historic buildings. Electrical fires are one of the most common causes of complete destruction of historic structures. That said, electric systems that are simply old or do not comply with current codes do not necessarily require replacement. The original system can be retained if it is: correctly installed per electrical codes in effect at the time, properly maintained, and meets electrical load requirements. Minor damages or deficiencies should be corrected. Additional circuits can be added to meet increased demand, provide grounding, or reduce demand on overloaded circuits.

3. A ground wire runs from the basement to ground on the west side of the building. The wire, although in a conduit, is subject to damage; it should be relocated and improved.

4. No wiring needs to be hung on the outside of a building. The wiring here is messy and unattractive.

### 3.5.11 Other

1. The room in the basement is framed with wood. Water has saturated lower framing members and deteriorated some drywall. Mold is rampant. I don't believe this room is worth salvaging; I suggest it be demolished and removed using precautions recommended by your mold remediation expert. If wood-framed construction is desired here in the future, the basement must first be dried to a reasonable level and any wood in contact with masonry or concrete should be preservative pressure-treated.

Figure 41: Interior of the basement room.

Figure 42: Piles of plastic foam scrap in attic.

2. The south attic has piles of small foam pieces which I assume is scrap. Please refer to Figure 42 (and Figure 28 and 29). These piles, and any other debris, should be removed to reduce fire load and permit access and ventilation.

3. The north section attic contains old sash which may be originals from this building. They should be carefully salvaged, tagged with any information known, and stored in the building to be used as patterns for restoration of the windows.

Figure 43: This sash, found in the north attic, may be original. It may contain valuable information about configuration and paint colors.

Figure 44: Carpet on the west porch.

4. The present carpet is shown in Figure 44. Carpets with an impermeable backing prevent wood from breathing and cause it to rot. The only carpet-like surface I recommend for exterior porches, steps, or landings is cocoa matting. Cocoa matting doesn't last for too many years but it will last much longer if removed during warm months. It allows the wood to breathe, prevents slipping, and cleans shoes well. We get ours from the Rug Market at 1085 East Ridge Road in Greece but it may be available many places.

5. The hand-carved gable fan is a piece of folk art. It should be carefully refinished by light sanding and painting to protect it from weather.

Figure 45: Carved fan in south gable.

Figure 46: Hole in north chimney.

6. The south section originally had two chimneys; the north chimney remains visible above the roof; both remain in the attic. An interior hole in the north chimney (Figure 46) helps ventilate the attic so I prefer it not be closed. At the moment it could admit pigeons and bats (I saw none); it should be screened to help keep the building clean.

### 3.5.12 Potential Restoration

1. Early photographs show soil east of the building just below the top of the basement access door. This is the grade elevation most historically appropriate. We can guess grade was lowered to provide space for parking. If it is desirable to retain this parking, making fill along the east wall undesirable, grade should still be raised against the south wall to return the south elevation to its historic appearance, and to permit the front elevation to be restored, including the porch if desired. If it is decided to save the parking by preserving the present grade along the east wall, a retaining wall can be built from the southeast corner of the building, eastward, to permit the south grade to be restored without affecting parking.

2. Restoration of the facade is a separate issue from restoration of the porch. This note deals with restoration of the facade.

   The facade should be relatively easy to restore to its original appearance. Many of the original details such as rake trim, gable fan, upper window openings, and quoins remain. Historic photos show wide, tall windows with operable shutters (then called “blinds”) either side of the center door, with sills just above the floor. Dimensions of original first floor openings can be discerned from the present facade.

3. Porches did not embellish all early buildings, they may not even have been common. Many early pictures show Federal and Greek Revival style buildings without porches; Historic Photos 6 and 7 in Attachment 5 are included to illustrate commercial buildings of the era without porches. The front porch shown in historic photos does not appear to be as old as the 1836 building; perhaps it was added in the second half of the nineteenth century. If one wishes to restore this building to its early appearance, restoration of the porch will be attractive but not necessary.

4. If windows are replaced, new windows should be made to match originals. Please refer to Section 3.5.11, Note 3.

5. The building interior is currently divided into 3 apartments. In order to optimize use of the building a new owner may wish to eliminate or rearrange interior partitions. Historic photographs (Historic Photos 8 and 9, Attachment 5, show the second floor of the south section was supported by a beam and column system. It appears from the first floor plan (Attachment 2.3) first floor posts have been removed and the second floor is now supported by modern partitions. If an open floor plan is preferred it should be relatively easy to remove the inserted partitions and restore steel posts to the original locations.

   The second floor ceiling of the south section appears to be supported by the attic trusses. If that is the case, second floor partitions can be removed and/or rearranged at will.

# 4 ATTACHMENTS

1. The Secretary of the Interior's "Standards for Rehabilitation," December, 2002.
2. Floor Plan Sketches, Bero Architecture PLLC, November, 2011.
3. DRAFT National Register Nomination form, Erin Anheier, 10/31/2011.
4. Some Thoughts on New York State Building Codes, Bero Architecture PLLC.
5. Historic Photos, courtesy of Melissa Ierlan, Clarendon Town Historian.
6. Tax Map showing the site and building approximately to scale.
7. Indenture describing the site dated December 17, 1979.
8. Site Boundaries Plot, Bero Architecture PLLC.
9. Sketch of the sewage disposal system, Micah Eldridge, 10/19/2009.
10. Some Thoughts on Rehabilitation Tax Credits, Bero Architecture PLLC.
11. Rafter Thrust Diagrams, Bero Architecture PLLC.
12. Some Thoughts on Stormwater Management, Bero Architecture PLC.
13. Preservation Brief 2: "Repointing Mortar Joints in Historic Masonry Buildings," National Park Service, 6/23/2008.
14. "Chimney Flashing," SMACNA Architectural Manual—3rd Edition, pp 28,29.
15. Glossary, Bero Architecture PLLC.

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# The Secretary of Interior's "Standards for Rehabilitation"

## Background

These are ten succinct standards which have become helpful guidelines for anyone caring for an historic structure. You may find them useful as you make the many decisions necessary when caring for your building. Compliance with these standards is mandatory when spending State or Federal funds on your building, and compliance is monitored by the SHPO.[1]

## Standards for Rehabilitation[2]

The Standards (Department of Interior regulations, 36 CFR 67) pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and the interior, related landscape features and the building's site and environment as well as attached, adjacent, or related new construction. The Standards are to be applied to specific rehabilitation projects in a reasonable manner, taking into consideration economic and technical feasibility.

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

---

[1] The SHPO (ship-o) is the State Office of Historic Preservation, a Federally mandated state agency. In New York the SHPO is the Office of Parks, Recreation, and Historic Preservation.

[2] The Standards and explanatory material are copied from the National Park Service web site: http://www.nps.gov/hps/TPS/tax/rhb/stand.htm.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

The intent of the Standards is to assist the long-term preservation of a property's significance through the preservation of historic materials and features. The Standards pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and interior of the buildings. They also encompass related landscape features and the building's site and environment, as well as attached, adjacent, or related new construction. To be certified for Federal tax purposes, a rehabilitation project must be determined by the Secretary to be consistent with the historic character of the structure(s), and where applicable, the district in which it is located.

As stated in the definition, the treatment "rehabilitation" assumes that at least some repair or alteration of the historic building will be needed in order to provide for an efficient contemporary use; however, these repairs and alterations must not damage or destroy materials, features or finishes that are important in defining the building's historic character. For example, certain treatments--if improperly applied--may cause or accelerate physical deterioration of the historic building. This can include using improper repointing or exterior masonry cleaning techniques, or introducing insulation that damages historic fabric. In almost all of these situations, use of these materials and treatments will result in a project that does not meet the Standards. Similarly, exterior additions that duplicate the form, material, and detailing of the structure to the extent that they compromise the historic character of the structure will fail to meet the Standards.

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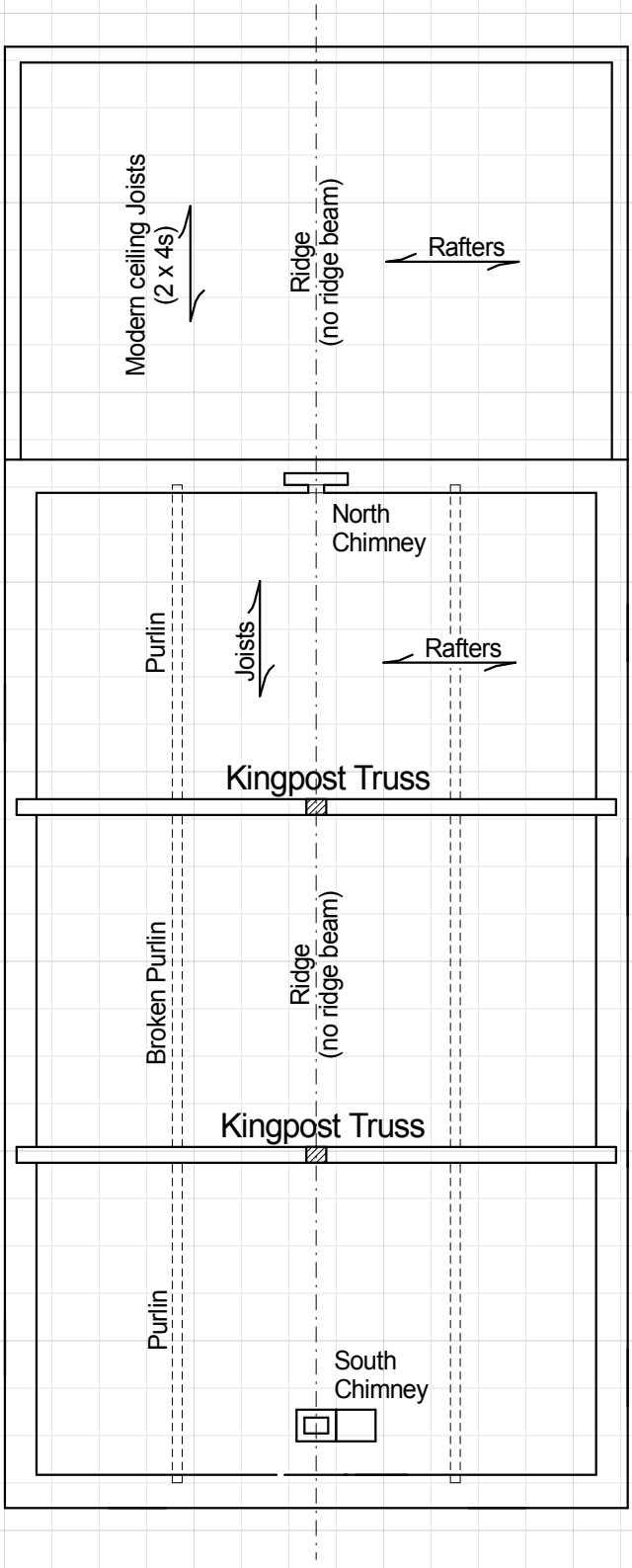
Called North




Attic Plan

This drawing is a sketch. Do not scale.

SK-1

Approximately 1/8" = 1'0"

November 30, 2011

Project 11210

Clarendon Stone Store

Attachment 2.1

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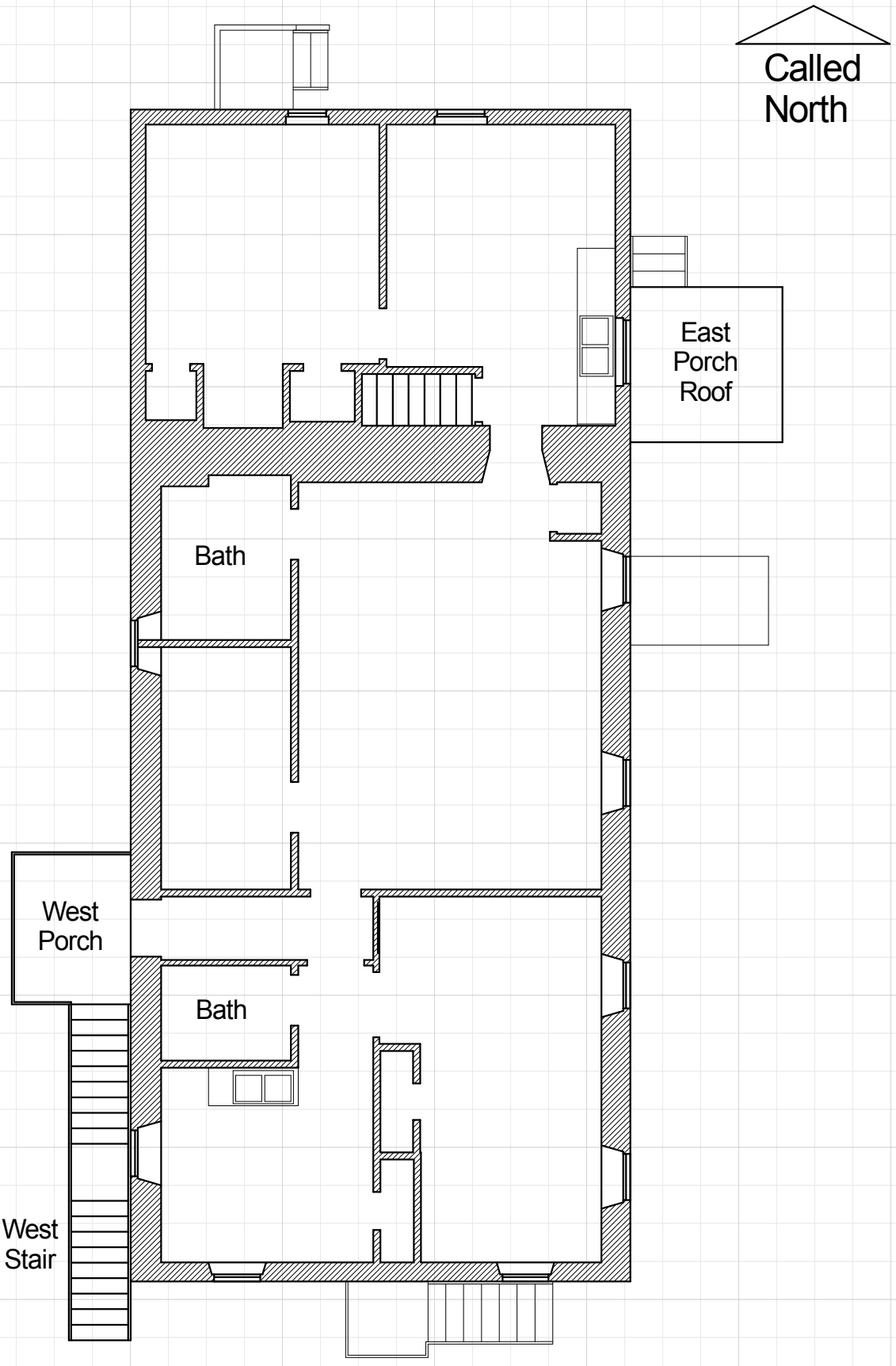


Second Floor Plan This drawing is a sketch. Do not scale. SK-2

Approximately 1/8" = 1'0" November 30, 2011 Project 11210

Clarendon Stone Store

Attachment 2.2

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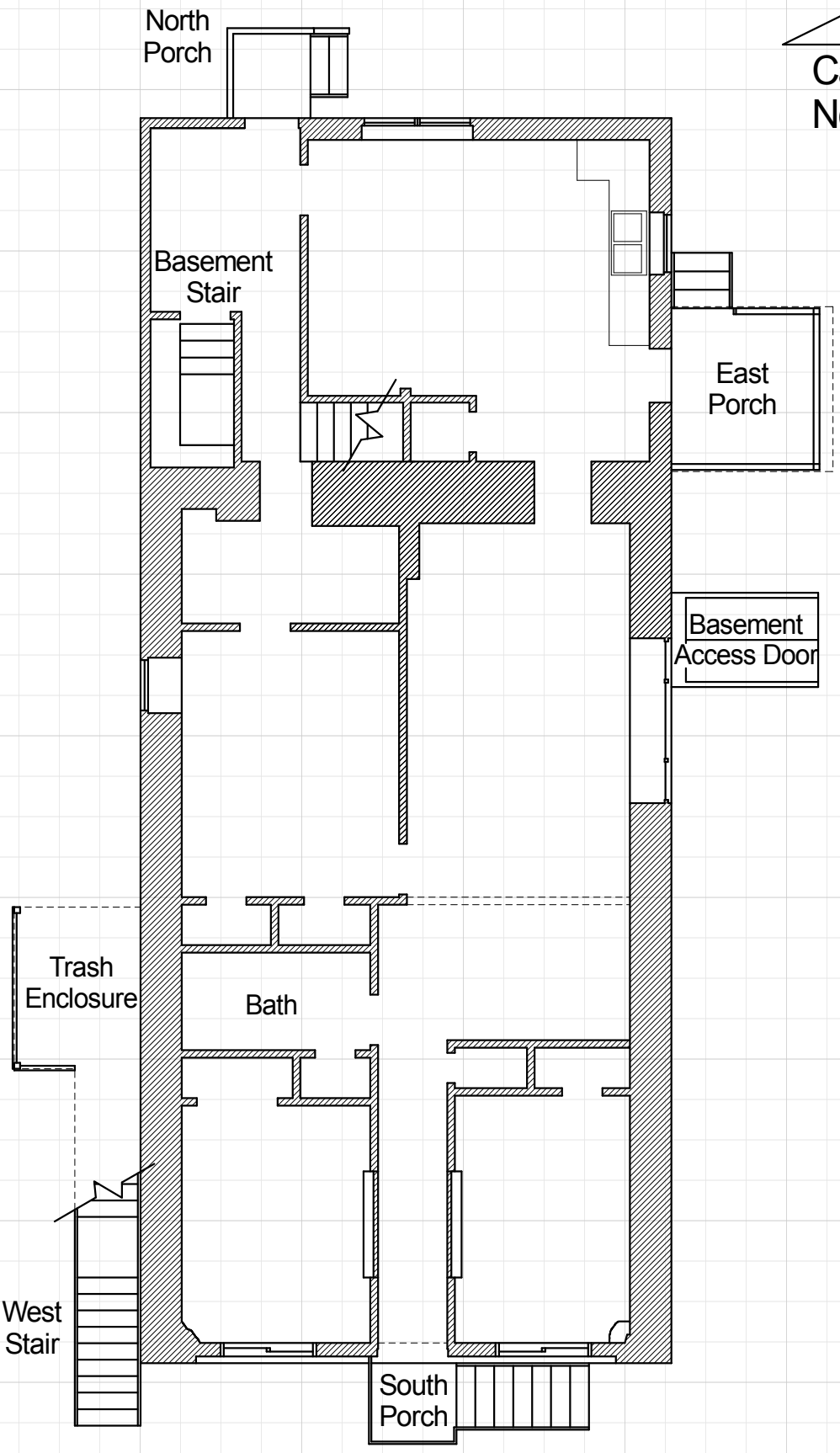


First Floor Plan

This drawing is a sketch. Do not scale.

SK-3

Approximately 1/8" = 1'0"

November 30, 2011

Project 11210

Clarendon Stone Store

Attachment 2.3

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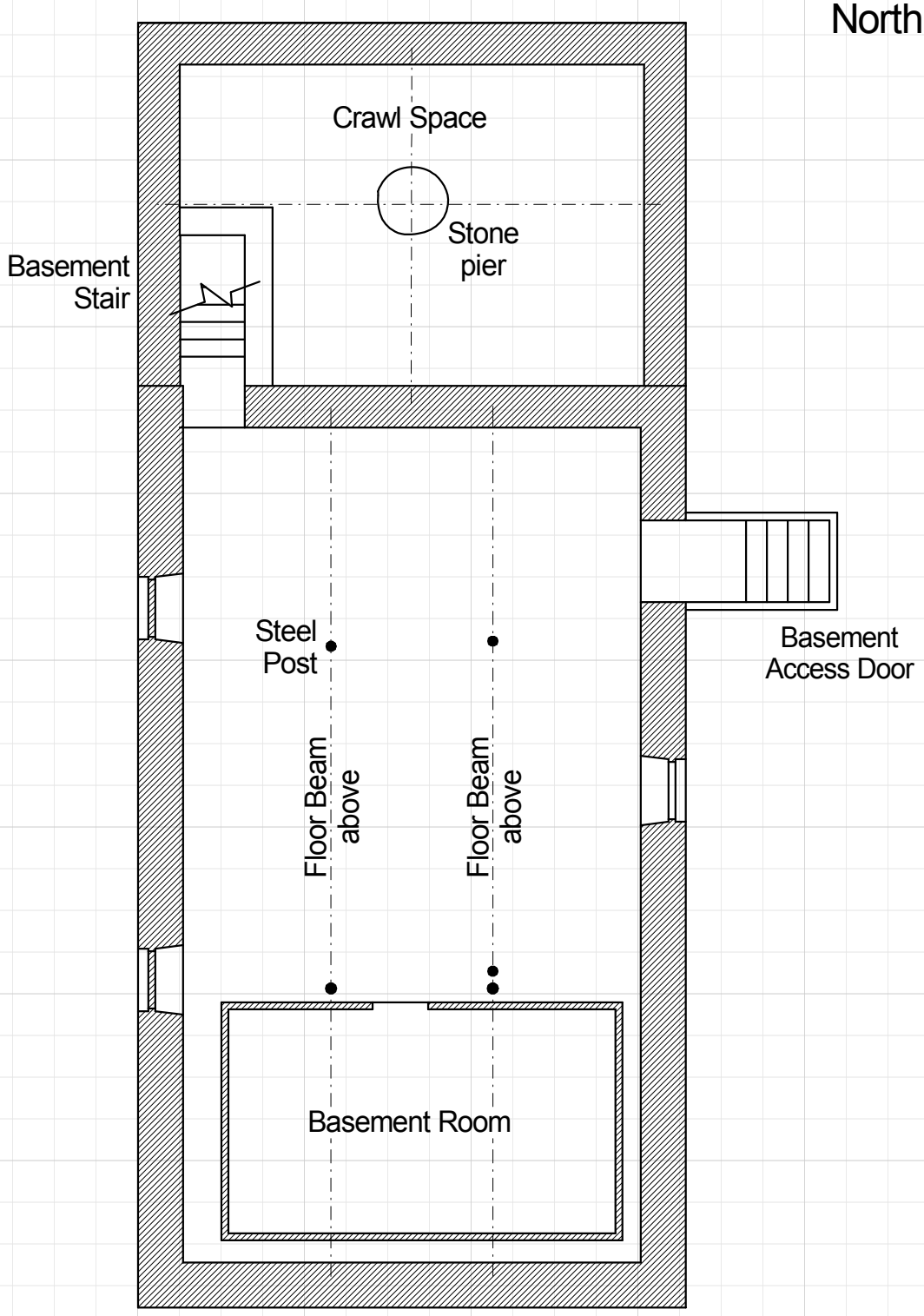


Baement Plan

This drawing is a sketch. Do not scale.

SK-4

Approximately 1/8" = 1'0"

November 30, 2011

Project 11210

Clarendon Stone Store

Attachment 2.4

**United States Department of the Interior**
National Park Service

# National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

## 1. Name of Property

historic name Clarendon Stone Store

other names/site number

## 2. Location

street & number 16301 East Lee Road ☐ not for publication

city or town Clarendon ☐ vicinity

state NY code county Orleans code zip code 14429

## 3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this ___ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ___ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

**___ national ___ statewide __local**

DRAFT

Signature of certifying official/Title Date

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official Date

Title State or Federal agency/bureau or Tribal Government

## 4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:)

Signature of the Keeper Date of Action

Attachment 3.1

Clarendon Stone Store
Name of Property

Orleans County, New York
County and State

## 5. Classification

**Ownership of Property**
(Check as many boxes as apply.)

| | |
|---|---|
| | private |
| x | public - Local |
| | public - State |
| | public - Federal |

**Category of Property**
(Check only **one** box.)

| | |
|---|---|
| x | building(s) |
| | district |
| | site |
| | structure |
| | object |

**Number of Resources within Property**
(Do not include previously listed resources in the count.)

| Contributing | Noncontributing | |
|---|---|---|
| 1 | | buildings |
| | | sites |
| | | structures |
| | | objects |
| 1 | | **Total** |

**Name of related multiple property listing**
(Enter "N/A" if property is not part of a multiple property listing)

**Number of contributing resources previously listed in the National Register**

DRAFT

## 6. Function or Use

**Historic Functions**
(Enter categories from instructions.)

COMMERCE/department store

**Current Functions**
(Enter categories from instructions.)

VACANT/NOT IN USE

## 7. Description

**Architectural Classification**
(Enter categories from instructions.)

EARLY REPUBLIC/Federal

other: two part commercial block

**Materials**
(Enter categories from instructions.)

foundation: STONE/Sandstone

walls: STONE/Sandstone

roof: ASPHALT

other: WOOD

**Narrative Description**

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

**Summary Paragraph**

Constructed in 1836, the Clarendon Stone Store is an early vernacular commercial building. The main portion of the building is a two-story gable front, rectangular block constructed of local Medina sandstone. A two-story, gable-roofed timber frame wing, currently clad in vinyl siding, extends from the rear elevation. The property sits on a small, prominent lot in the heart of the hamlet of Clarendon at the intersections of Route 237 and 31A. It sits close to both roads and is the most visually significant structure in the hamlet. With a symmetrical façade, simple cornice line trim, and a large fanlight in the gable peak, the building represents a simple, vernacular interpretation of the Federal style.

---

**Narrative Description**

The two-story gable-roofed stone section measures approximately 44.5 feet x 26.5 feet and retains what appears to be the original trim on the cornice (estimated at 12-16 inches) beneath the roof line. Historic photos show a chimney at each end of the stone section. One of these no longer penetrates the roof, but still exists in the attic space. The ashlar front of the stone section faces the intersection, basically facing south.

The symmetrical front façade is three bays wide with a centered entrance with ashlar Medina sandstone laid in regular courses. The first floor storefront was infilled in 1978 with non-historic concrete block. Historically, the storefront consisted of a center entrance with double doors flanked by a two-over-two display window on either side. In the mid to late 1800's, a simple covered porch supported by turned posts spanned the width of the façade. It is believed this Victorian styled porch was not part of the original design. Today the entrance and front first floor window openings have been downsized, however the splayed sandstone lintels remain intact. The porch has also been removed with simple wooden decking providing staircase access to the entrance. On the second story two modern one-over-one windows with cut stone sills and lintels were historically vertically aligned with the display windows below. Although the second story windows are replacements, historic photos dating from the mid to late 1800's show one-over-one windows. A large decorative fanlight located in the gable peak dominates the façade and serves as one of only a few architectural details in this vernacular commercial building. The fanlight is composed of a carved sandstone arch with keystone surrounding a carved fluted wooden fan.

The stone on the east elevation of the building is rough-cut, laid in what appears to be irregular courses. A layer of stucco or other parging has been applied to both the east and west elevations. A single, large picture window that likely dates to the mid-20th century is present on the first story of this elevation. Historic photos show that it replaced a traditional double hung wood window. Some cement blocks have been infilled above the window. Four double hung modern replacement windows are evenly spaced across the second story of the east elevation. The window openings themselves have not been altered and retain the historic stone lintels and sills. There is a window to the basement that is currently covered with wood, it has a substantial sandstone lintel.

The rear timber frame wing attaches to the rear/north elevation of the stone building, flush with both the east and west elevations of the original building and measuring approximately 17.5 feet x 26.5 feet. The roofline of the wing rises slightly below that of the stone building. Historic photos show a wide band of trim along the cornice line, suggesting that the wing may have been added between the 1840s and 1860s when the Greek Revival style dominated. The wing is clad in vinyl siding, obscuring possible remnants of original detailing. Vertical tongue and groove wood sheathing is present beneath the non-historic siding.

On the east elevation is a small, non-original wooden porch and door. Historic photos show that this opening was originally a window. Currently a single small, rectangular window is visible on both the first and second stories.

The north/rear elevation of the addition contains a first floor entrance and paired modern double hung windows. Two double hung windows, which appear to be historic openings, are present above. There have been no historic photos of this side of the building located to date.

PROOF

The west side of the addition has no openings and, like the east elevation, is flush with the stone portion. The addition has hand hewn beams and a shallow crawl space instead of a basement.

The west elevation of the original building possesses the same rough-cut, irregular coursed and parged stone as described on the east elevation. An open wooden staircase leads to a second story entrance. The current staircase is not historic but historic photos show the existence of the entrance and placement of the staircase. The existing staircase utilizes the cast iron hooks mortared into the stone to stabilize it. There is a doorway at the top of the stairs and two windows on the second floor and one on the first, each with cut stone sills and lintels. There is a basement window located beneath the stairway that matches the one on the east side. Another window on the first floor has a wooden frame.

The 5/12 pitched roof consists of asphalt three tab shingles laid upon 4'x 8' sheets of plywood over original 11-18 inch wide strip sheathing boards. This is supported by 4 inch by 3 inch sawn common rafters that run up from the rafter plate to the opposite common rafter at the ridge on 32 inch centers. There is no ridge board. At the half-span of the common rafter is a 2 inch by 8 inch sawn plank purlin mortised and pegged into two hung kingpost trussed principal rafters 15 feet on center. These trussed principal rafters share the roof load and carry the mortised-in ceiling joists which are wood lathed and plastered below. The hung kingpost trussed rafters are hand hewn hardwood with the kingpost being 10 inches by 8 inches wide at the base with a reduction to 4 inches by 8 inches at the joggles(top) where the 7 inch by 7 inch principal rafters are mortised and tenoned and pegged to the kingpost joggles. The base of the kingpost is anchored to the tie beam (bottom of the truss) with a half-dovetail tenon with an oak wedge and two pegs 4 inches on center. The hung kingpost trussed rafter tie beam has a double mortise and tenon at each rafter plate. At this point the principal rafter tail is tenoned into the tie beam and pegged. The two gable ends are laid up stone with a 7 inch by7 inch rafter.

The interior has been heavily remodeled with three apartments, one on the first floor and two on the second. The original board ceiling of the first floor store section is present above a drop ceiling. The supporting beams which run the length of the stone section are also visible with their historic moldings. Portions of the second floor retain the original plaster walls and ceilings. The signature of "B. Copeland" is found painted on the plaster of the stairwell leading to the basement. This most likely is from Reverend Benjamin Copeland (1855-1940), one of George M. Copeland's twelve children. However, it could also be from George M. Copeland's brother or uncle (1791-1879), each also named Benjamin.

There are no outbuildings associated with the property.

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## 8. Statement of Significance

### Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [ ] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [x] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

### Criteria Considerations

(Mark "x" in all the boxes that apply.)

Property is:

- [ ] A Owned by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [ ] E a reconstructed building, object, or structure.
- [ ] F a commemorative property.
- [ ] G less than 50 years old or achieving significance within the past 50 years.

### Areas of Significance

(Enter categories from instructions.)

Architecture

### Period of Significance

1836-1975 operated as general store

### Significant Dates

1836 construction

### Significant Person

(Complete only if Criterion B is marked above.)

### Cultural Affiliation

### Architect/Builder

Stonework done by William Knowles

Woodwork by Wood and Ira B. Keeler

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### Period of Significance (justification)

The store was built in 1836 and operated as a general store until 1975.

### Criteria Considerations (explanation, if necessary)

**Statement of Significance Summary Paragraph** (Provide a summary paragraph that includes level of significance and applicable criteria.)

The Clarendon Stone Store is being nominated to the National Register of Historic Places under Criterion C in the area of Architecture as a rare example of a free-standing Federal style commercial building constructed of local Medina sandstone. In its use of a locally available material and with simple detailing, the building represents a vernacular application of the Federal style. It represents an early use of Medina sandstone in local construction, predating the later regional popularity of this material. The Stone Store was built as a general store in 1836 and served that function until 1975. It is one of only a few remaining 19th century commercial buildings in the hamlet of Clarendon and, in addition to being the most visually prominent building in the hamlet, has historically been a prominent center of culture, commerce, and development in the community.

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**Narrative Statement of Significance** (Provide at least **one** paragraph for each area of significance.)

The Clarendon Stone Store is significant as a rare example of a commercial building executed in the Federal style. The general form of the building, the symmetry, the simple cornice line trim, rectangular lintels, and a large elliptical fanlight in the gable peak reference the Federal style. The decorative fanlight dominates the façade and serves as the main architectural detail on an otherwise simple building. In its simplicity and lack of ornament, coupled with the use of a regional material, Medina sandstone, the Stone Store represents a vernacular interpretation of Federal style architecture. Although similar commercial buildings, executed in cobblestone, limestone, or brick have been identified in central and western New York, at this time, this building is the only known example of a vernacular Federal style, Medina sandstone commercial building in Orleans County.

The Federal style dominated American domestic architecture from the late 18th century until approximately 1820, with local examples occurring until about 1840. High style examples predominate in coastal cities in the northeast and mid-Atlantic states. In rural western New York counties such as Orleans County, extant examples of Federal style architecture occur most often as vernacular wood frame or brick farmhouses.

The use of local Medina sandstone further adds to the significance of this building as it represents a relatively rare early use of this regional building material. Medina sandstone is a sedimentary rock formed in the Silurian period when an ancient sea covered this area. A layer is found from Buffalo eastward across the state to beyond Syracuse. It ranges in color from light gray to reddish brown. At the gorge in Letchworth State Park it is 3,000 feet below the surface. However, in Orleans County it lies very near the surface. Farmers in the area frequently upturn pieces of Medina sandstone while tilling the earth and large deposits can be found with very little digging. This made it a readily available building material for the area. It is commonly seen in the foundations of wood-frame houses and barns throughout the County. It also was used for the construction of stone houses, utility buildings, and commercial buildings. Although Medina sandstone is

prevalent in barn and house foundations throughout the County, its use as a primary building material in the first half of the 19th century is relatively rare.

Many of the Medina sandstone buildings that once existed have been razed. Most of the known extant examples in the Town of Clarendon and surrounding towns and villages in Orleans County are farmhouses, or originally functioned as commercial buildings, but have since been converted to residences. Medina sandstone homes built in Clarendon around the same time as the store include the 1833 example at 4290 Holley-Byron Rd, 1.4 miles north of the store, the 1837 example at 4203 Fancher Rd., 1.9 miles northwest, and the 1863 example at 4160 South Holley Rd., 2.8 miles northeast of the store. Another sandstone house, built in 1833, was demolished recently at 17144 Fourth Section Rd., 3 miles east of the store.

The Erie Canal, located about three and a half miles northeast of the Stone Store, was completed in 1825. During its construction, word spread of the abundance of readily available sandstone in Orleans County. Much of the stone was used in the construction of the canal for bridges, culverts and docks, making the period of 1822-1824 the first period of serious quarrying. After the canal was finished, use of the stone returned to mostly local building projects until the first commercial quarry of this sandstone was established in 1837 by John Ryan in Medina, NY, giving the stone its name. This was one year after construction of the Clarendon Stone Store. Beginning in the late 1830s, the Medina sandstone quarries became an important industry for Orleans County. Soon the Canal banks within Orleans County were lined with sandstone quarries. Quarries also populated the countryside farther from the Canal. There were at least five Medina sandstone quarries in the Town of Clarendon, primarily in the north eastern part. The sandstone quarried near Medina tended to be gray or brownish, further east in the County it tended towards red. Red is the primary color found in the Town of Clarendon. In the early days, gray was popular for paving and building, but in 1870, architect Henry Hobson Richardson began using rock-faced red Medina sandstone for his monumental Buffalo State Hospital and changed the public taste to preferring red for building. This favored the quarries in eastern Orleans County.

The stone gained worldwide recognition in the mid 1800's being transported by the Erie Canal and later the railroad. It was used in the pillars of the Brooklyn, George Washington and Williamsburg Bridges, Buckingham Palace, the streets of Havana, Cuba, Cleveland and Toledo, Ohio and Buffalo and Rochester, NY, Sibley Hall at Cornell University and many notable buildings especially in the eastern United States. In 1905 it was said that three fourths of the stone used in the buildings in Buffalo was Medina Sandstone. A single piece of stone was quarried for use in the New York State Capitol which measured 12 inches thick, 12 feet wide and 30 feet long. Orleans County boasts many beautiful churches of the stone. It was perfect for harbor breakwalls, millions of miles of city curbing, cobblestones and flagstones.[1] The heyday of the quarries began in the 1890s and continued until 1912. In 1900 there were 50 quarries in the County and 2,000 acres of sandstone quarrying land. Medina sandstone quarrying was one of the chief factors for the importance of Orleans County as one of the political units of the State of New York. It is widely claimed that the introduction of Portland cement was responsible for the demise of the Medina sandstone quarrying industry.

Medina sandstone is of an extremely fine grain, strong, silicious and almost free from calcium. The stone was lauded for its durability, crushing strain and the ability to withstand fire. Tests of crushing strains found it sustained greater amounts than other sandstones, marbles, limestone and most granites. The average crushing strain is twenty-three thousand pounds per square inch on edge and twenty-seven thousand pounds per square inch on bed. When subjected to heat sufficient to melt copper (1,984 degrees F) and suddenly cooled it retains its strength better than limestone, granite, marble or other sandstones. It was considered fireproof as witnessed by the complete destruction of the interiors of several burned buildings without damage to the stone. It was used as a lining for lime kilns and baker's ovens. It wears evenly without scaling or flaking and will not accept a polish, so never becomes smooth or slippery. It accepts carvings of delicate designs.

Other locally available materials were also used in the construction of the Stone Store. The ruins of a lime kiln still exist approximately 150 feet to the north of the store. This was most likely the source of the lime for the mortar used in the store. Lumber and lathe was most likely sourced from the sawmill, established in 1811, located a few hundred feet to the south.

The Clarendon Stone Store was constructed in 1836 by owner David Sturges, a successful local businessman. The stonework was done by a local mason, William Knowles and others. The woodwork was done by local craftsmen Wood and Ira B. Keeler. From 1836-1843 David Sturges and George M. Copeland operated the store as partners. Following Sturges' death, Copeland continued to operate the store until 1892. Records indicate that the Copeland family operated the store until 1915 when Herbert Allis purchased the property. Allis, in turn, owned the building until 1927. Over the next 48 years, the store passed through a series of owners, remaining in operation until 1975.[1]

From 1836 until 1975, the Stone Store functioned primarily as a general store, however, it also housed a number of ancillary functions. These include the Post Office of Clarendon, a tailor shop, a seamstress shop, a shoe store business, a public meeting room, a Sabbath School, the site of the court, a doctor's office, a dentist office and a residence for two of the store owners. Other than the Post Office, these functions were located in the second story commercial space. Indeed, historic photos show an exterior staircase to the side/west elevation second floor entrance. For well over a century, this store functioned as the commercial and social hub of this community. (Reference attached article entitled "150th Anniversary of Clarendon's Stone Store" written by Kathryn McAllister in 1986 for greater detail.)

Historical details of the second level floor plan have not been discovered. It is known that the first resident was the family of Wesley Potter during the time he operated the store (1955-1959).

Since the Stone Store ceased functioning as a commercial space in 1975, both the first and second floors have been subdivided into residential units. The building is now owned by the Town of Clarendon and has been vacant since 2007. The Town condemned the building in 2007 due to lack of septic maintenance. A dedicated group of local citizens are working to find a new owner to rehabilitate the building.

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**Developmental history/additional historic context information** (if appropriate)

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**Local Context – Commerce & Development**

Although a very small community with a Town population of approximately 3,800, the hamlet of Clarendon is the principal settlement in the Town of Clarendon (Orleans County). Historically, the north end of the hamlet's commercial center began with the Stone Store at the intersection of Holley Byron Rd (Rt. 237) and East Lee Rd (Rt. 31A). Historic photos show a mix of simple, vernacular wood-frame commercial buildings and Greek Revival style commercial buildings lining Holley Byron Rd south from the Stone Store.

The Clarendon Stone Store is one of only three 19th century commercial buildings remaining in the hamlet and the only one constructed of stone. Most of the wood-frame commercial buildings that once lined the main thoroughfare are no longer extant, replaced by 20th century buildings or parking lots. Like the Stone Store, the remaining commercial buildings have been converted to residential use (one has been condemned and faces an uncertain future). The Stone Store is sited on a prominent, raised lot at the north intersection of the hamlet, making it the visual focal point for the community. In addition to being visually prominent, the building played a prominent role in Clarendon's development and commerce. As a general store, the stone building not only enjoyed a central and commanding location at the heart of the hamlet but functioned as a social center as well, being the place people came to get the local news, meet their neighbors, pick up their mail and generally keep themselves involved with the community in addition to shopping.

The hamlet of Clarendon was established in 1811 when Eldridge Farwell (1770-1843) purchased 200 acres and built a saw mill the same year and a grist mill in 1814. At this time the community was known as "Farwell's Mills". (When the Town of Clarendon was established from part of the Town of Sweden in 1821, Farwell chose the name in honor of Clarendon, Vermont.) The first blacksmith opened for business in 1813. In the early 1800s the town boasted a commercial center that included a tannery, a distillery, a pearl and potash factory, an ashery (owned by David Sturges), a carriage manufacturer, a wagon repair shop, a lime kiln, a grain storehouse, a butcher, a barbershop, a coffin maker, a cooper shop, a canning factory, an ice house, taverns and inns. Prior to the railroad reaching Holley, NY in 1851 it was a stopping point for teamsters on the way to the Erie Canal.

The first regular store at "The Mills" was kept by Denman Brainerd and later, in 1821, by Hiram Frisbee and Pierpont. In 1829, David Sturges became proprietor, in the same location, then known as the "old red store" being the only painted building in the community. He left that location in 1836 when he had the Stone Store built. Sturges enjoyed great success, building the first frame house in the community in 1816 while all other dwellings were constructed of logs. He also built the first brick house in 1830. Over the years, Sturges bought out competitors such as Elizur Platt and Eldridge Farwell, Jr. until his death at age 52 from the effects of cancer, preceded by amputation.

In 1830, David Sturges (1791-1843) bought the property from Eldredge Farwell, the founder of Clarendon. Sturges built the Stone Store in 1836 at the junction of Main, Holley and Albion Streets. He already operated a general store in the hamlet. George Morey Copeland (1815-1892) was his business partner. David Sturges was referred to as "the prince merchant of Clarendon" by historical author David Sturges Copeland, a son of George M. Copeland. George married David Sturges's daughter, Laura Ann (1817-1869) and had twelve children.

Footnotes:

1. See Waters and Lacy
2. Subsequent store operators:
   1927-1955 David Symonds, followed by his daughter Olive Symonds Potter
   1955-1959 Wesley Potter, son of Olive
   1959-1962 Henry Fleming
   1962-1975 Charles Gunter

## 9. Major Bibliographical References

**Bibliography** (Cite the books, articles, and other sources used in preparing this form.)


Copeland, David Sturges, The History of Clarendon From 1810 to 1888. Buffalo: The Courier Company, Printers, 1889; reprint ed. Cornell University Library, 1995.

Grinnel, E. W., compiler, Medina: Here's To Our Heritage, A Partial Community History. Albion, NY: Lake County Pennysaver, 1996

Horton, John Theodore, et al., History of Northwestern New York. New York: Lewis Historical Publishing Co. Inc., 1947

Isselhard, Alan, Clarendon's Medina Sandstone Quarries. September 1,1989, unpublished article available at Office of Town Historian, Clarendon, NY

Johnson, Neil, Albion, Oh Albion. A weekly article appearing in the Albion Advertiser, Albion, NY, from articles published May 18 and 25, 1994

Medina Quarry Company, Medina, The Stone Everlasting. Promotional booklet published in 1905, reprinted in July 2007 by the Medina Sandstone Society, Medina, NY

Merrill, Arch, The Towpath. Rochester, NY: The Gannett Company, 1945

McAllister, Kathryn, 150th Anniversary of Clarendon's Stone Store. 1986, unpublished article available at Office of Town Historian, Clarendon, NY

Waters, Robert E., and Lacy, Craig C., 30 Years That Made Medina History, a publication of the Medina Sandstone Society

White, Celia A., Medina Past and Present. 1982, compiled on the occasion of the 150th anniversary of the Incorporation of the Village, Medina NY

Deeds located in the Orleans County, NY Records Department


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**Previous documentation on file (NPS):**

____preliminary determination of individual listing (36 CFR 67 has been requested)
____previously listed in the National Register
____previously determined eligible by the National Register
____designated a National Historic Landmark
____recorded by Historic American Buildings Survey #_____
____recorded by Historic American Engineering Record # _____
____recorded by Historic American Landscape Survey # _____

**Primary location of additional data:**

____State Historic Preservation Office
____Other State agency
____Federal agency
____Local government
____University
__x__Other
Name of repository: **Office of Town Historian, Clarendon, NY**

Historic Resources Survey Number (if assigned): _____

## 10. Geographical Data

**Acreage of Property** Less than one acre
(Do not include previously listed resource acreage.)

**UTM References**
(Place additional UTM references on a continuation sheet.)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Zone | Easting | Northing | 3 | Zone | Easting | Northing |
| 2 | Zone | Easting | Northing | 4 | Zone | Easting | Northing |

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**Verbal Boundary Description** (Describe the boundaries of the property.)

The property is on the northwest intersection of NYS Route 237 (Byron Holley Rd.) and NYS Route 31A (East Lee Rd.). There is 77.88 feet frontage on Route 237, and 35.48 feet frontage on Route 31A. The western side is approximately 132 feet deep. The eastern side is irregularly shaped, extending 65.34 feet from Route 237, then vectoring in a northerly direction for 48.04 feet.

**Boundary Justification** (Explain why the boundaries were selected.)

## 11. Form Prepared By

name/title Erin Anheier
organization Old Stone Store Preservation Committee date October 31 , 2011
street & number 4690 Bennetts Corners Rd telephone 810-965-7248
city or town Holley state NY zip code 14470
e-mail erinanheier@aol.com

## Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items.)

**Photographs:**

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Clarendon Stone Store

City or Vicinity: Clarendon, NY

County: Orleans State: NY

Photographer: various

Date Photographed: various

Description of Photograph(s) and number:

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1 of 10. Front façade (south)

Photographer: Erin Anheier

Date Photographed: 08-09-2011

2 of 10. East Elevation

Photographer: Erin Anheier

Date Photographed: 08-09-2011

3 of 10. Rear (North); Includes partial view of east elevation; Tank filling apparatus is on adjacent property

Photographer: Erin Anheier

Date Photographed: 08-09-2011

4 of 10. West Elevation

Photographer: Erin Anheier

Date Photographed: 08-09-2011

5 of 10. King Post Truss in Attic

Photographer: Melissa Ierlan

Date Photographed: 08-03-2011

6 of 10. Historic Photo – Front Façade and Partial View of East Elevation

Photographer: Unknown

Date Photographed: mid to late 1800's

7 of 10. Historic Photo – Front Façade and Partial View of West Elevation, Showing Exterior Stair Case

Photographer: Unknown

Date Photographed: mid to late 1800's

8 of 10. Historic Photo – Street View, Looking North to Stone Store, Showing Rest of Commercial District

Photographer: Unknown

Date Photographed: late 1800's

9 of 10. Historic Photo – Interior, First Floor, Looking North

Photographer: Unknown

Date Photographed: circa 1927

10 of 10. Historic Photo – Interior, First Floor, Looking South

Photographer: Unknown

Date Photographed: circa 1960

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**Property Owner:**

(Complete this item at the request of the SHPO or FPO.)

name Town of Clarendon

street & number 16385 Church Street/P.O. Box 145 telephone 585-638-6371

city or town Clarendon state NY zip code 14429

**Paperwork Reduction Act Statement:** This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).

**Estimated Burden Statement**: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management. U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.

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# SOME THOUGHTS ON NEW YORK BUILDING CODES

New York State has adopted a family of codes which regulates the operation and construction of buildings.

## Building Operation

Codes applicable to operation of all nonresidential existing buildings include:

*Property Maintenance Code of New York State*[1]
*Fire Code of New York State*[2]
*Fuel Gas Code of New York State*
*Mechanical Code of New York State*
*Plumbing Code of New York State*

Bero Architecture recommends operators of buildings obtain copies of these codes, review their provisions, and comply with their requirements. The *Property Maintenance Code* and the *Fire Code*, in particular, are brief and written for the average building operator; they do not require specialized knowledge assumed by writers of the Fuel Gas, Mechanical, and Plumbing Codes.

## Building Changes

Codes applicable to new and changed nonresidential buildings include the operational codes discussed above plus:

*Building Code of New York State*
*Existing Building Code of New York State*
*Energy Conservation Construction Code of New York State*

The *Building Code of New York State* is the code usually referenced by building professionals. It is primarily applicable to new buildings but if the use of an existing building is changed, the Building Code applies as if it were a new building. The *Existing Building Code of New York State*, contrary to its name, does not apply to existing buildings, it applies only to the ". . . repair, alteration, change of occupancy, addition and relocation of existing buildings."

[1] The *Property Maintenance Code of New York State* is a brief document, ". . . intended to provide minimum requirements to safeguard public safety, health and general welfare insofar as they are affected by the occupancy and maintenance of structures and premises." It requires all sites and buildings be kept in good repair; and all systems (heating, plumbing, electrical, fire suppression, etc.) be kept in good working order. Exterior wood must be painted, windows must be operable, etc. This code applies to all existing buildings, whenever built.

[2] The Fire Code of New York State, ". . . is intended to provide minimum requirements consistent with nationally recognized good practices that offer a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises." This Code also applies to all buildings, whenever built. It focuses on, among other things, fire safety of flammable materials, system maintenance (particularly fire protection systems), access for fire fighting, and maintenance of egress from buildings. If you are interested in the code requirements for a Christmas tree stand, Section 804 of this Code is where you will find them.

So these Codes are usually triggered only by change; as most buildings stand, assuming they have Certificates of Occupancy for current uses, they are not required to comply with most provisions of *Building*, *Existing Building*, and *Energy Conservation Construction Codes*. Nevertheless, these codes are good standards to use as targets for improvements.

All the Codes incorporate by reference the National Electrical Code which governs the installation of electrical equipment in buildings. It has evolved outside the normal governmental code development process due property insurers' need for confidence buildings they insure are reasonably safe from fires caused by faulty electrical installations.

For all work, including electrical work, we recommend reference to this family of codes to help ensure buildings are safe and secure.

**Residences**

Residences are ". . . detached one- and two-family dwellings and townhouses not more than three stories above grade in height with a separate means of egress and their accessory structures and one-family dwellings converted to bed and breakfast dwellings."[3] Both new and existing residences are regulated by their own code governing both construction and operation, the *Residential Code of New York State*.

**Agricultural Buildings**

Barns, sheds, poultry houses, and other buildings and equipment used directly and solely for agricultural purposes are specifically exempted from provisions of the *Building*, the *Existing Building*, and the *Fire Codes of New York Stat*, provided they are not used for ". . .human habitation, as a place of employment where agricultural products are processed, treated or packaged, or as place used by the public."[4]

**Historic Buildings**

In New York State, historic buildings are defined by the Code as:

> Any building or structure that is listed in the State or National Register of Historic Places; designated as a historic property under local or state designation law or survey; certified as a contributing resource within a National Register listed or locally designated historic district; or with an opinion or certification that the property is eligible to be listed on the National or State Register of Historic Places either individually or as a contributing building to a historic district by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places.[5]

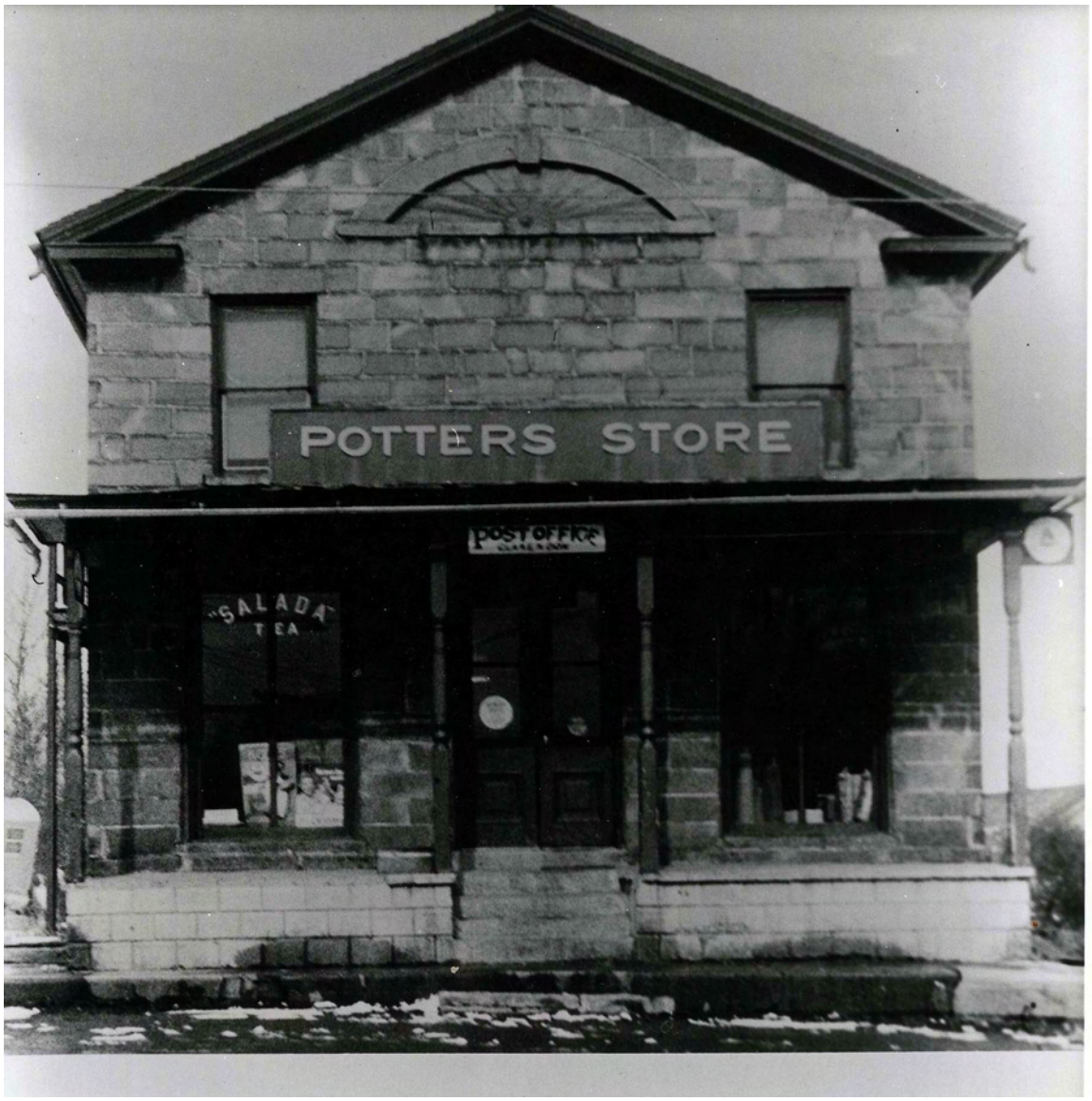
In many circumstances certain onerous Code requirements can be waived for historic buildings by local authorities. When planning for any change requiring a building permit, you should investigate the potential advantages of being declared an historic building by reviewing the Codes and meeting with the local Code Enforcement Officer.

[3] *Residential Code of New York State*, 2010, Section R101, Title, Scope and Purpose.
[4] *Building Code of New York State*, 2010, Section 202, Definitions.

[5] *Existing Building Code of New York State*, 2010, Section 202, General Definitions.

Historic Photo 1. Copeland Store, c. mid- to late 1880s. *(unless noted, historic photos are courtesy of Melissa Lerlan).*

Historic Photo 2. Copeland Store, date unknown, street view from the south.

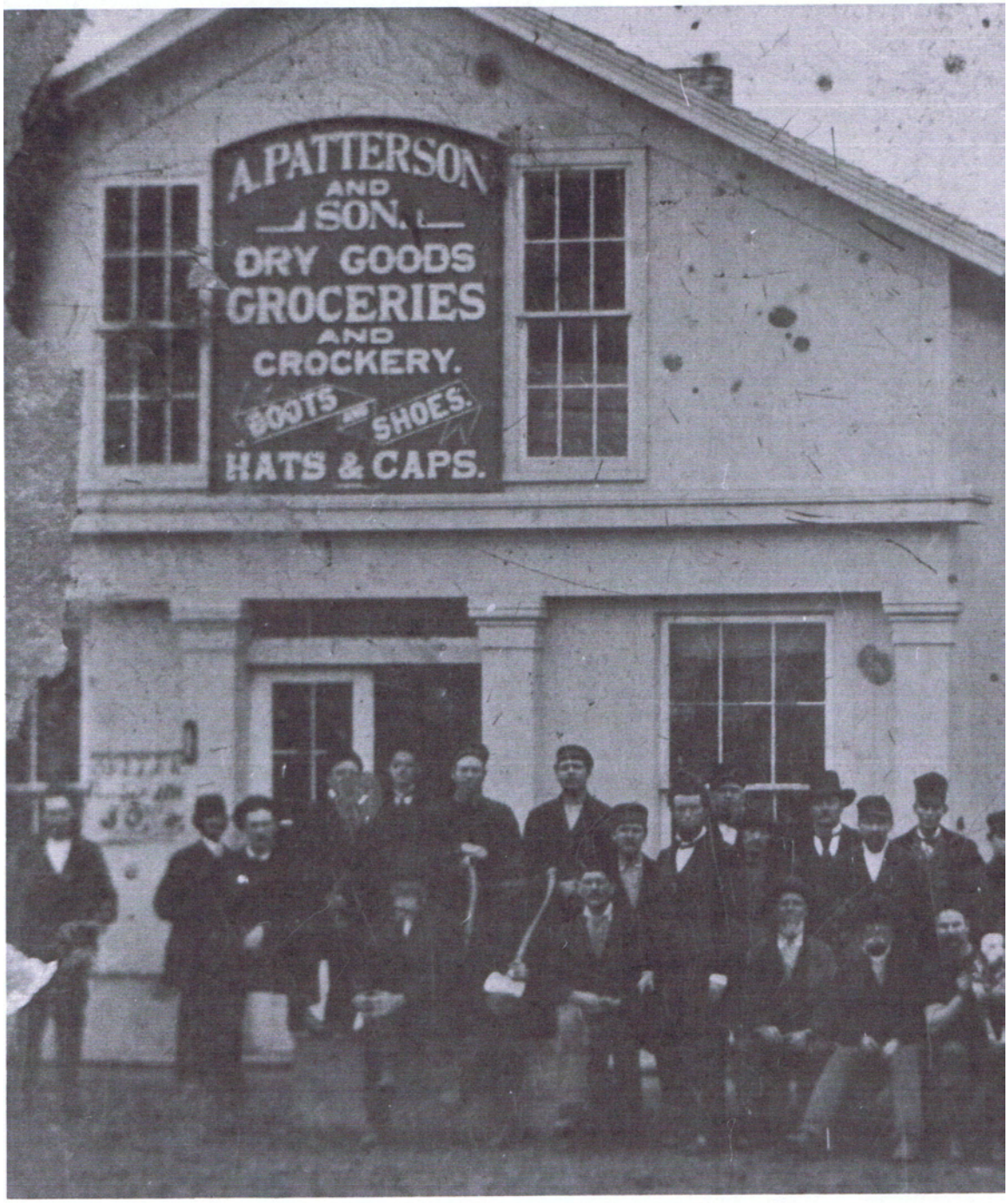



Historic Photo 3. Potters Store. Date unknown. Wood porch has been replaced with stone or concrete block.

Historic Photo 4. Arrowhead store, c. 1940, street view from the south.

Historic Photo 5. Clarendon Stone Store, c.1991, porch and steps have been replaced. Exterior stair at west wall is covered with a roof.

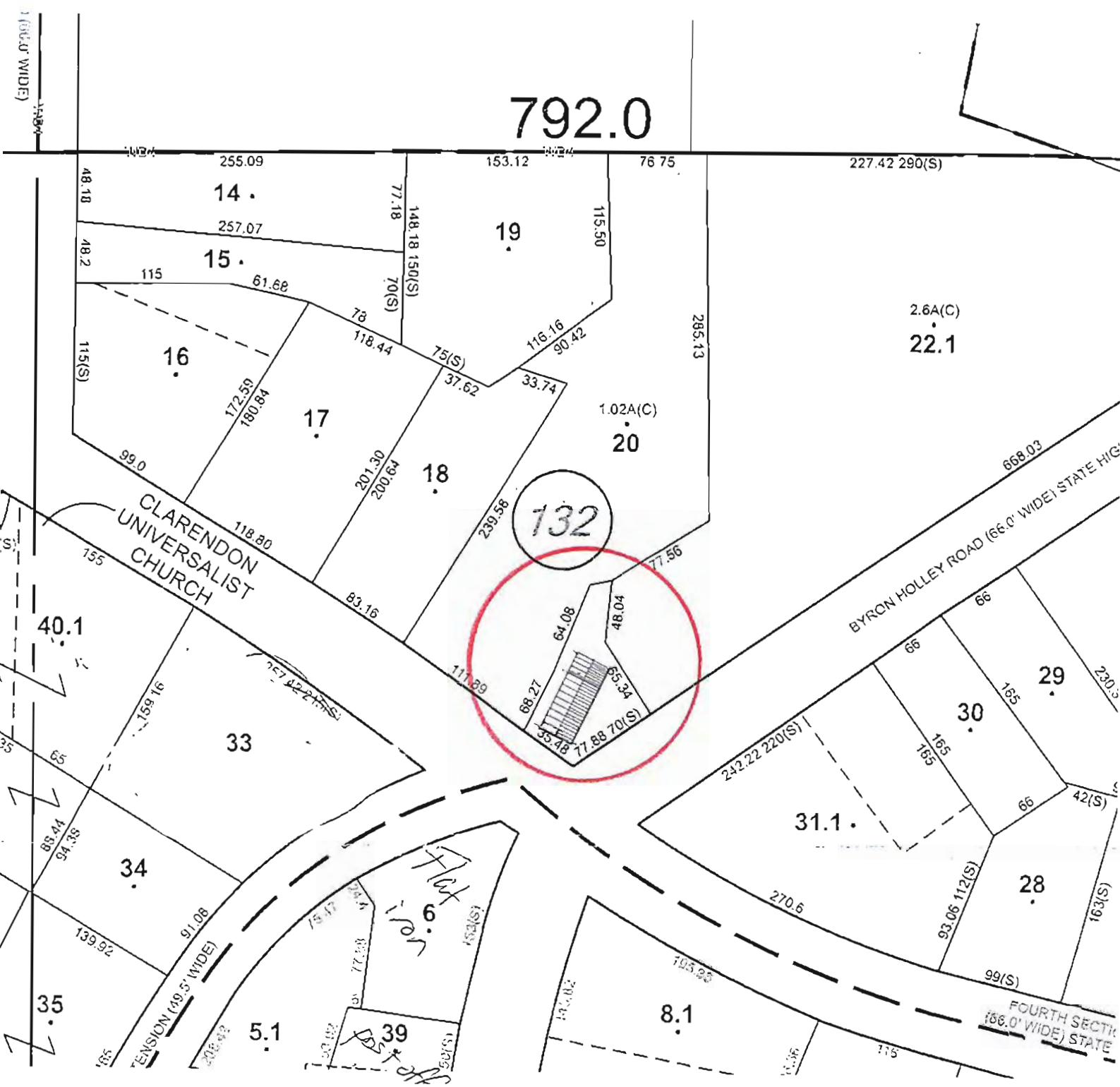
Historic Photo 6. Millville Store, October 2011. No evidence can be seen in the photo of a porch roof. The stoop is twentieth century, probably built parallel to the front wall in response to road widening. *(Photo courtesy of Erin Anheier)*




Historic Photo 7. A nearby store on Route 237. No evidence of a porch. The Greek Revival style and clothing indicate the photo was taken in the mid-nineteenth century.

Historic Photo 8. Interior of Stone Store dated "after 1924."

Historic Photo 9. Reputed to be of Hank Flemming's store in the 1960s.




Attachment 6

FORM 583½ N. Y. DEED—WARRANTY with Lien Covenant 1890 TUTBLANX REGISTERED U. S. PAT. OFFICE TUTTLE LAW PRINT PUBLISHERS, RUTLAND, VT. 05701

# This Indenture,

*Made the* 17th *day of* December *Nineteen Hundred and* Seventy-nine

**Between** CHARLES L. GUNTER and DOROTHY J. GUNTER, husband and wife, residing in the Town of Clarendon, Orleans County, New York,

BOOK 397 PAGE 60

*parties of the first part, and*

WILLIAM F. BOMBARD and LOIS A. BOMBARD, husband and wife, residin at 48 Village Square, Holley, New York, as tenants by the entirety.

*parties of the second part,*

**Witnesseth** *that the parties of the first part, in consideration of* - - - - - - - - - - ONE AND MORE - - - - - - - - - *Dollars* ($ 1.00+ ) *lawful money of the United States, paid by the parties of the second part, do hereby grant and release unto the parties of the second part,* their distributees *and assigns forever, all*

THAT TRACT OR PARCEL OF LAND, situate in the Town of Clarendon, County of Orleans and State of New York, being a part of Lot No. One Hundred Thirty-Two (132) in the Third (3rd) Township of the 100,000 Acre or Connecticut Tract and bounded as follows: BEGINNING at the intersection point of the north line of the Holley and Barre Roads; thence north fifty-seven (57) degrees west fifty-eight (58) links; thence north twenty (20) degrees, forty-five (45) minutes east ninety-seven and one-half (97½) links; thence north thirty-three (33) degrees forty (40) minutes east eighty-five (85) links; thence north eleven (11) degrees forty-five (45) minutes east twenty-seven and one-fourth (27¼) links; thence north fifty-nine (59) degrees forty-five (45) minutes east twenty-seven (27) links; thence south thirty-nine (39) links; thence south seventy-three (73) degrees thirty (30) minutes east thirty-one (31) links; thence south sixty (60) degrees west forty-six (46) links; thence south thirty-four (34) degrees east ninety-nine (99) links to the Holley Road; and thence south fifty-six (56) degrees west one (1) chain and eighteen (18) links to the place of beginning.

Subject to easements, covenants and restrictions of record affecting the above described premises.

Being the same premises conveyed to the parties of the first part hereto by deed executed by Henry R. Flemming and Norma B. Flemming, dated October 12, 1964 and recorded in Orleans County Clerk's Office in Liber 317 of Deeds at page 209.

N.Y.

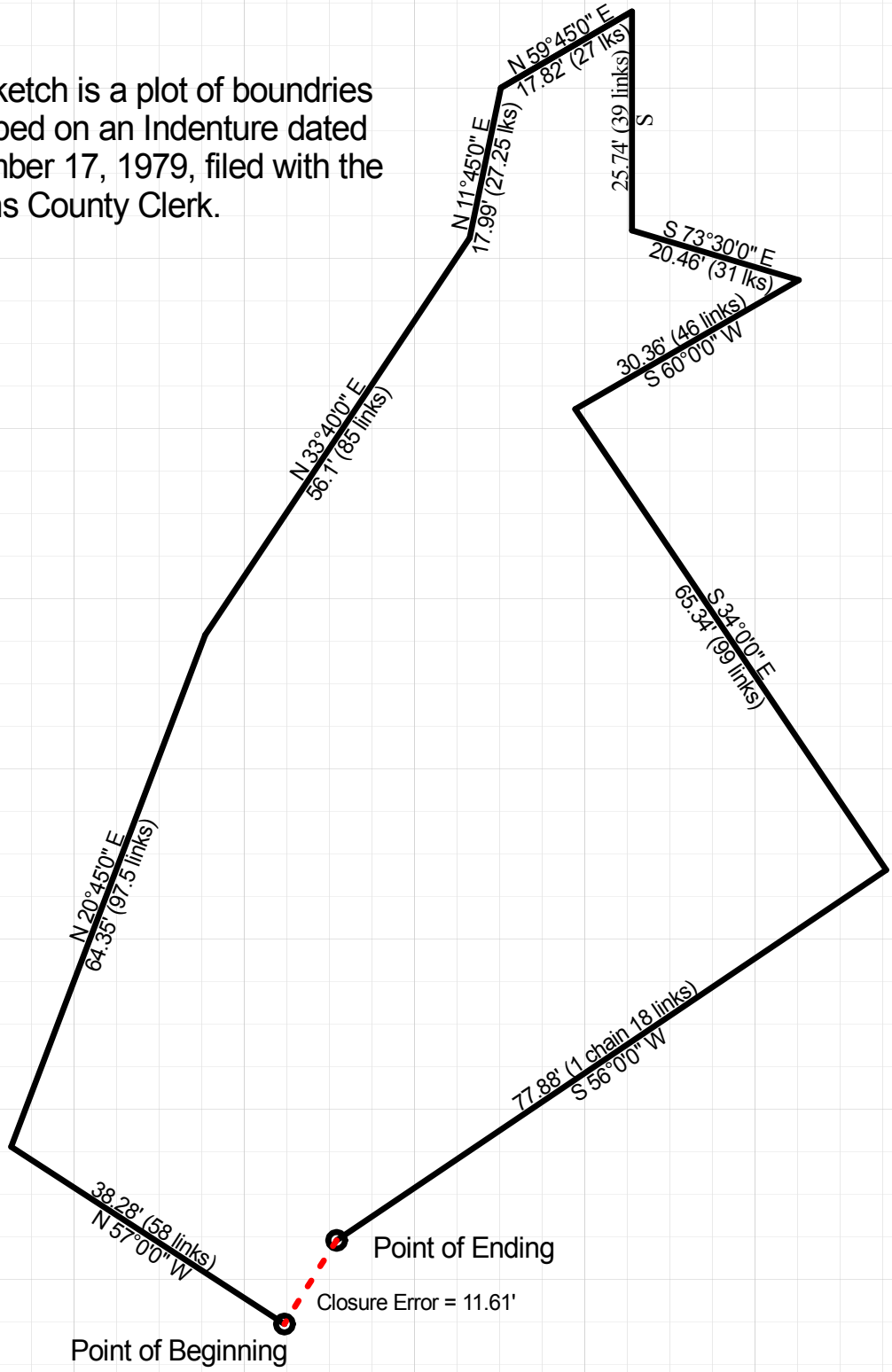
RECEIVED
$17.60
REAL ESTATE
DEC 18 1979
TRANSFER TAX
ORLEANS
COUNTY

RECEIVED
DEC 18 3 46 PM '79
ORLEANS COUNTY
CLERKS OFFICE
ALBION, N.Y.

Attachment 7

b e r o  a r c h i t e c t u r e  pllc
32 Winthrop Street, Rochester, New York 14607
(585) 262-2035 contact@beroarchitecture.com fax: (585) 262-2054

This sketch is a plot of boundries described on an Indenture dated December 17, 1979, filed with the Orleans County Clerk.

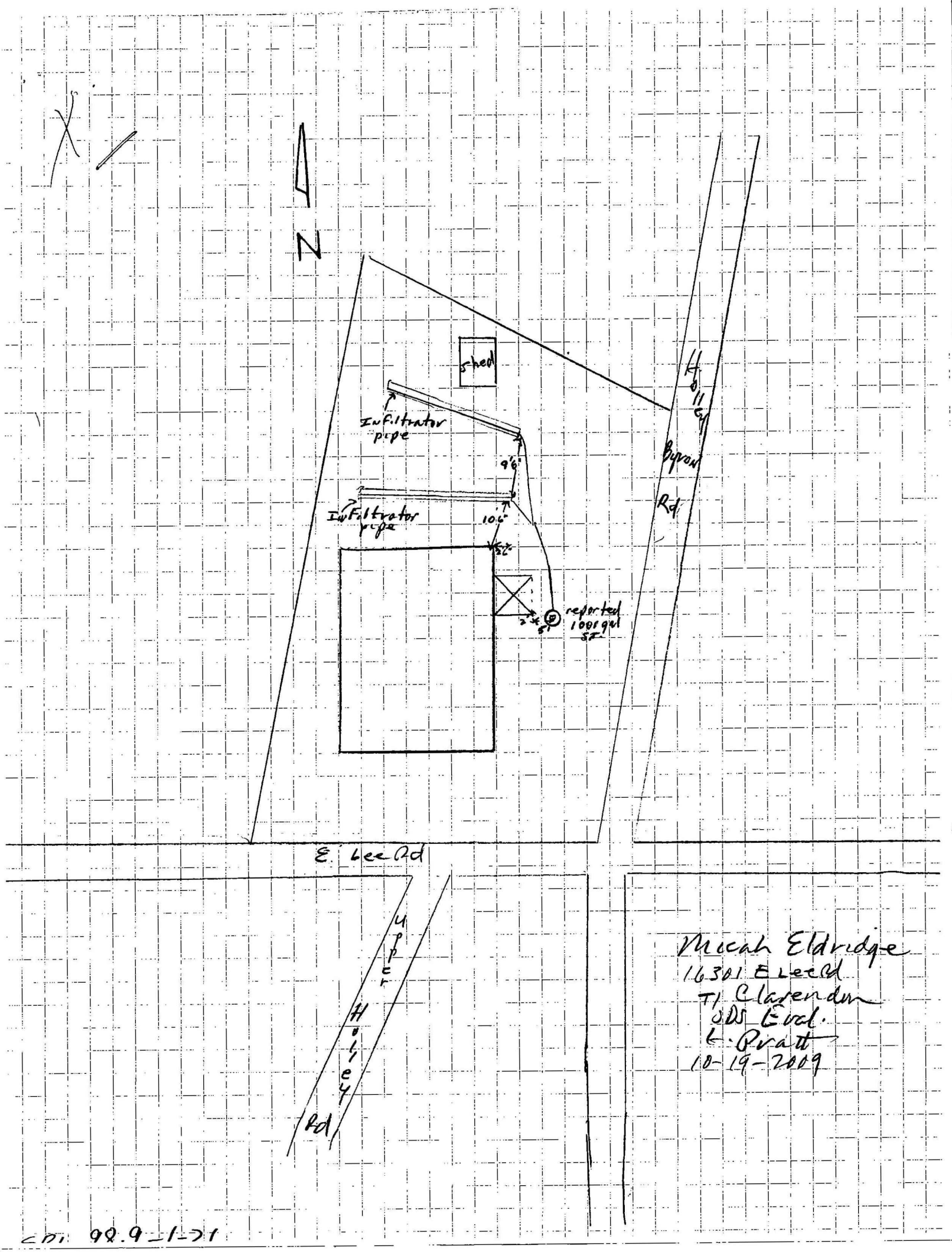



Site Boundaries Plot SK- 5

1" = 20' November 30, 2011 11210

Clarendon Stone Store

Attachment 8


N
shed
Infiltrator pipe
9'6"
Infiltrator pipe
10'6"
reported 1000 gal ST
Hollow
Byron
Rd
E. Lee Rd
Upper
Holley
Rd
Micah Eldridge
16301 E Lee Rd
T/ Clarendon
SDS Eval.
L. Pratt
10-19-2009

cm: 99.9-1-71

B E R O A R C H I T E C T U R E P L L C

A R C H I T E C T U R E S U S T A I N A B I L I T Y P R E S E R V A T I O N

Thirty Two Winthrop Street, Rochester, New York 14607
585-262-2035 (phone) • 585-262-2054 (fax) • contact@beroarchitecture.com (email)

# SOME THOUGHTS ON REHABILITATION TAX CREDITS[1]

Since 1977, federal tax credits for the rehabilitation of historic buildings have facilitated over 34,000 projects, leveraging over $50 billion in private investment.[2] These projects have helped to return vacant and underutilized properties to productive use, enhanced local tax rolls, and created jobs. A recently enacted New York State credit program matches the federal incentive for certain income-producing buildings and adds a credit for rehabilitation of owner-occupied residences in economically challenged neighborhoods.

## The 20% Federal Tax Credit for Income-Producing Buildings

The federal tax credit is available only to income-producing buildings (such as rental apartments, hotels, offices, and retail buildings). The building must be:

a) Individually listed in the National Register of Historic Places; or
b) A contributing building in a district listed in the National Register; or
c) A contributing building in a local historic district that has been certified as substantially meeting National Register criteria.

The credit is available only for *substantial* rehabilitations: the project cost must equal or exceed $5,000 or the *adjusted basis* (a calculation of the value of the building), whichever is greater. The credit value is 20% of *qualified rehabilitation expenses*, and is a dollar-for-dollar reduction of income tax liability (not a deduction). Qualified rehabilitation expenses (QREs) are costs associated with rehabilitating the historic building, including construction costs and fees. Costs related to acquisition, construction of an addition, furniture, or landscaping are examples of expenditures that do not count as QREs.

To qualify for the credit, the project must comply with the Secretary of the Interior's Standards for Rehabilitation. These standards are designed to protect the building's important features while allowing sensitive conversion to a new use. The State Historic Preservation Office (SHPO) is responsible for reviewing projects for compliance with the standards.

## The State Commercial Credit

New York State now offers a tax credit for the rehabilitation of certain historic commercial properties eligible for the federal credit. Like the federal credit, the state credit amount is 20% of

[1] While Bero Architecture PLLC can provide guidance as to the architectural and preservation aspects of the tax credit, decision-making power rests with the state and federal agencies referenced (SHPO, IRS, and NPS). Bero Architecture does not have expertise in legal or accounting matters, and nothing in this publication substitutes for the advice of an attorney or accountant.

[2] The National Trust for Historic Preservation, http://www.preservationnation.org/issues/rehabilitation-tax-credits/federal/ (Accessed 5/6/2010). See also The Historic Tax Credit Coalition, *First Annual Report on the Economic Impact of the Federal Historic Tax Credit.* March 2010, http://www.preservationnation.org/issues/community-revitalization/jobs/Rutgers-Report.pdf (Accessed 4/20/2010).

qualified rehabilitation costs. Unlike the federal credit, the state program caps credit value at $5,000,000 and is only available to projects in specific, economically distressed areas.

**The 10% Federal Tax Credit for Non-Historic Rehabilitations**

A 10% credit is available for the rehabilitation of buildings constructed before 1936 that are not listed in or eligible for the National Register. The rehabilitation must cost at least $5,000 or the adjusted basis of the property, whichever is greater, and the building must be used for a non-residential income-producing use, such as office or hotel, but not apartments. The rehabilitation must retain at least 75% of the external walls and internal structural framework.[3]

**NYS Residential Credit**

A new state tax credit enables owner-occupants of buildings individually designated in the National Register, or which contribute to a National Register-listed district, to take a credit of 20% of the cost of rehabilitation, up to a $50,000 credit. The property must be located in an economically distressed census tract. The project must cost at least $5,000, at least 5% of which must be spent on the exterior of the building, and the work must be reviewed by SHPO for compliance with the Secretary's Standards.

**Tips for Using the Credits**

- Contact SHPO as early in the process as possible, **before** starting work, and wait for official SHPO and National Park Service (NPS) approval before beginning. SHPO staff take their role in protecting taxpayer interests seriously and must uphold National Park Service and Internal Revenue Service regulations. Too often, owners expect to apply for the credits when the project is complete. It is highly unlikely that SHPO and the NPS will certify the credits under these conditions; we never recommend taking this risk.

- Assemble a qualified team of experts. These will include a tax professional to ensure compliance with IRS regulations and a preservation architect to interpret and implement NPS standards and guidelines. Large and complex projects may involve many more players to ensure a smooth process. Bero Architecture has assisted many clients with tax credit projects, providing design services and completing the necessary paperwork to document compliance.

- Take a comprehensive set of photos before starting the project. (This typically falls within the preservation architect's scope of work.) This documents the pre-rehabilitation condition and is needed to demonstrate appropriateness of the proposed and completed work.

**Useful References**

National Park Service tax incentives information: http://www.nps.gov/history/hps/tps/tax/hpcappl.htm

The Secretary of the Interior's Standards: http://www.nps.gov/history/hps/tps/tax/rehabstandards.htm

[3] Note that if the building is *eligible* for the 20% Federal tax credit *it is not eligible for this 10% credit.*

b e r o  a r c h i t e c t u r e  p c
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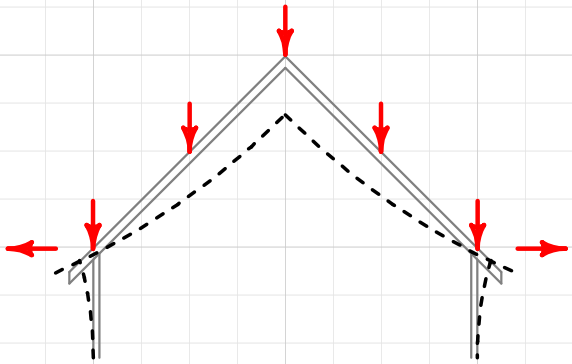
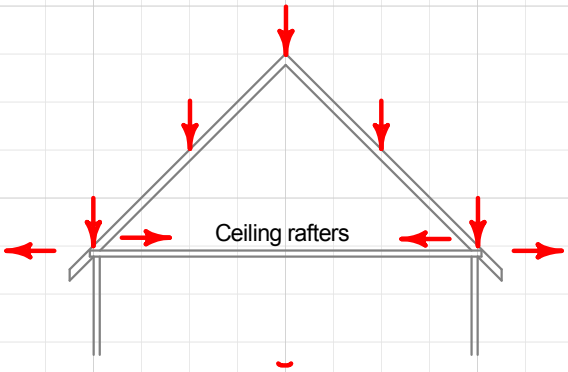
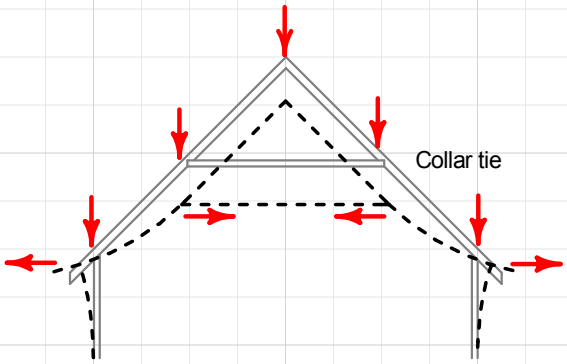
(585) 262-2035 contact@beroarchitecture.com fax: (585) 262-2054



Vertical roof loads cause an outward thrust at the rafter seats




In the most common situation, ceiling rafters restrain the horizontal thrust




In some cases, collar ties are used to restrain the horizontal thrust but are not as effective as ceiling rafters

NOTE: Dashed lines show the exaggerated deflected shape of the structure

# Rafter Thrust Diagrams

No Scale | November 30, 2011 | BA915

Technical Handouts

BERO ARCHITECTURE PLLC

ARCHITECTURE SUSTAINABILITY PRESERVATION

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# SOME THOUGHTS ON STORMWATER MANAGEMENT

Stormwater management is an important part of a building's protective umbrella. Proper management extends the life of the foundation, discourages wood boring insects and rot, and creates a healthy environment for both people and building materials. Proper stormwater management and adequate ventilation will help keep basements dry and free of mold, mildew, and other potentially health threatening organisms. Stormwater management has four aspects: collection, disposal, and site grading. Maintenance is an important component of each aspect.

## COLLECTION

### Built-in Gutters

Built-in gutters are usually found on high style homes or institutional buildings where the appearance of hung gutters is undesirable. Built-in systems are usually well designed and constructed. However, they require the same yearly maintenance as hung gutters and receive it just as infrequently. Since built-in gutters are part of a building's structure, they must be carefully maintained. Minor leaks can damage walls, ceilings, and structural components with little indication that damage is occurring and expensive repairs are necessary. For these reasons, built-in gutters are more likely to contribute to the loss of historic building details and building structure than hung gutters; we are hesitant to recommend built-ins.

### Hung Gutters

We recommend either copper or galvanized steel half-round hung gutters with soldered joints. They are historically appropriate, more durable than aluminum gutters, and less likely to cause damage to the building structure if they leak than built-in gutters. When properly installed, steel or copper gutters will bear the weight of ladders without denting and withstand the rigors of heavy snow loads and ice damming. Both metals can be joined by soldering; the popular aluminum gutters and downspouts must be sealed with caulking which has a relatively short life compared to solder. Aluminum K-style gutters are often installed with spike and ferrule fasteners. Do not use this hanging system for gutters of any style or metal. The spike pierces the gutter below the high water line allowing leaks that cause the cornice and rafter tails to rot and the spike to loosen. The cost savings available by using aluminum gutters is achieved by using lower quality materials and installation techniques that provide reduced performance and durability.

Hangers should be attached without fastening through the roofing and spaced closely enough (16" on center, maximum) to resist snow loading and ice build-up. All straps, downspouts, fasteners, and other components in contact with one another must be the same metal (i.e.

galvanized to galvanized, copper to copper) to prevent galvanic corrosion, deterioration at the contact point of dissimilar metals subject to wet conditions. New gutters and downspouts should be correctly sized and installed to meet the square footage and slope requirements of the roof.

Downspouts should drop with as few horizontal runs as possible. These are unsightly and cause maintenance problems. Strainers should be installed at gutter outlets to help protect downspouts; leaves and debris are easier to clean from a gutter than when packed into the length of a downspout. New downspouts should be corrugated galvanized or copper with the back seam soldered. Downspouts should not be permanently connected (riveted, screwed, or soldered) to the gutters but should be loosely connected to the outlet leader or connected with a conductor head to allow vertical contraction and expansion of the downspout. Downspouts should be supported by wall brackets, not by hanging from the gutter.

## DISPOSAL

Once the water is collected and led to grade it can be dumped on the ground or into an underground disposal system. The least attractive of these alternatives is to dump it on the ground. If there is no other alternative, a substantial (preferably precast concrete) splashblock should be positioned under a discharge elbow and properly pitched and aimed to get the water as far from the foundation as possible. This system usually fails after a brief time due to settlement of the grade, removal of splashblocks for lawn mowing, or any number of other reasons. Unless there is constant attention to splashblock placement, water usually finds its way into the foundation or crawl space, violating the aim of the stormwater collection system. The best means of stormwater disposal is into your municipal storm sewer or into underground piping run to daylight on the property. At the transition point from downspout to underground piping, a cast iron clean-out “T” must be used for access and durability. These are more expensive than PVC fittings, but PVC does not stand up to ultraviolet light or impact by lawn mowers.

## SITE GRADING

Over time the soil tends to settle near the foundation creating a grade that is neutral or sloped toward the building. Beneath eaves without benefit of gutters a trough develops that collects water at or near the foundation. Where splashblocks or downspouts have failed, large quantities of water are concentrated at points along the foundation creating depressions and ponding. Depressed areas also form around the base of large or old foundation plants. Water collected in these low areas will eventually find its way into the basement. Compacted soil sloped away from the foundation at a gradient of one half-inch per foot over ten feet or more is generally adequate. Basement windows may require wells to accommodate the grade and keep their wooden components dry.

## MAINTENANCE

Ongoing maintenance is required of any gutter system. If an owner waits for physical signs of system failure to appear on the building fabric, unnecessary damage will occur. Gutters need to be cleaned and inspected at least once a year. Take the time to: remove any debris; make sure all components are in place after the mowing season; inspect all gutters, downspouts, and disposal systems; and repair damage.

2 Preservation Briefs
Technical Preservation Services
National Park Service
U.S. Department of the Interior

# Repointing Mortar Joints in Historic Masonry Buildings

**Robert C. Mack, FAIA, and John P. Speweik**

»Historical Background
Identifying the Problem Before Repointing
»Finding an Appropriate Mortar Match
»Properties of Mortar
»Mortar Analysis
»Components of Mortar
»Mortar Type and Mix
»Budgeting and Scheduling
»Contractor Selection
»Execution of the Work
»Visually Examining the Mortar and the Masonry Units
»Summary
»Conclusion
»Selected Reading

**A NOTE TO OUR USERS:** The web versions of the **Preservation Briefs** differ somewhat from the printed versions. Many illustrations are new, captions are simplified, illustrations are typically in color rather than black and white, and some complex charts have been omitted.

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**Masonry--brick, stone, terra-cotta, and concrete block--is found on nearly every historic building.** Structures with all-masonry exteriors come to mind immediately, but most other buildings at least have masonry foundations or chimneys. Although generally considered "permanent," masonry is subject to deterioration, especially at the mortar joints. Repointing, also known simply as "pointing"or--somewhat inaccurately--"tuck pointing"*, is the process of removing deteriorated mortar from the joints of a masonry wall and replacing it with new mortar. Properly done, repointing restores the visual and physical integrity of the masonry. Improperly done, repointing not only detracts from the appearance of the building, but may also cause physical damage to the masonry units themselves.

The purpose of this Brief is to provide general guidance on appropriate materials and methods for repointing historic masonry buildings and it is intended to benefit building owners, architects, and contractors. The Brief should serve as a guide to prepare specifications for repointing historic masonry buildings. It should also help develop sensitivity to the particular needs of historic masonry, and to assist historic building owners in working cooperatively with architects, architectural conservators and historic preservation consultants, and contractors. Although specifically intended for historic buildings, the guidance is appropriate for other masonry buildings as well. This publication updates *Preservation Briefs 2: Repointing Mortar Joints in Historic Brick Buildings* to include all types of historic unit masonry. The scope of the earlier Brief has also been expanded to acknowledge that the many buildings constructed in the first half of the 20th century are now historic and eligible for listing in the National Register of Historic Places, and that they may have been originally constructed with portland cement mortar.

**Tuckpointing technically describes a primarily decorative application of a raised mortar joint or lime putty joint on top of flush mortar joints.*

## Historical Background

Mortar consisting primarily of lime and sand has been used as an integral part of masonry structures for thousands of years. Up until about the mid-19th century, lime or quicklime (sometimes called lump lime) was delivered to construction sites, where it had to be slaked, or combined with water. Mixing with water caused it to boil and resulted in a wet lime putty that was left to mature in a pit or wooden box for several weeks, up to a year. Traditional mortar was made from lime putty, or slaked lime, combined with local sand, generally in a ratio of 1 part lime putty to 3 parts sand by volume. Often other ingredients, such as crushed marine shells (another source of lime), brick dust, clay, natural cements, pigments, and even animal hair were also added to mortar, but the basic formulation for lime putty and sand mortar remained unchanged for centuries until the advent of portland cement or its forerunner, Roman cement, a natural, hydraulic cement.

**Portland cement** was patented in Great Britain in 1824. It was named after the stone from Portland in Dorset which it resembled when hard. This is a fast-curing, hydraulic cement which hardens under water. Portland cement was first manufactured in the United States in 1872, although it was imported before this date. But it was not in common use throughout the country until the early 20th century. Up until the turn of the century portland cement was considered primarily an additive, or "minor ingredient" to help accelerate mortar set time. By the 1930s, however, most masons used a mix of equal parts portland cement and lime putty. Thus, the mortar found in masonry structures built between 1873 and 1930 can range from pure lime and sand mixes to a wide variety of lime, portland cement, and sand combinations.

In the 1930s more new mortar products intended to hasten and simplify masons' work were introduced in the U.S. These included **masonry cement**, a premixed, bagged mortar which is a combination of portland cement and ground limestone, and **hydrated lime**, machine-slaked lime that eliminated the necessity of slaking quicklime into putty at the site.

## Identifying the Problem Before Repointing

The decision to repoint is most often related to some obvious sign of deterioration, such as disintegrating mortar, cracks in mortar joints, loose bricks or stones, damp walls, or damaged plasterwork. It is, however, erroneous to assume that repointing alone will solve deficiencies that result from other problems. The root cause of the deterioration--leaking roofs or gutters, differential settlement of the building, capillary action causing rising damp, or extreme weather exposure--should always be dealt with prior to beginning work. Without appropriate repairs to eliminate the source of the problem, mortar deterioration will continue and any repointing will have been a waste of time and money.

**Use of Consultants.** Because there are so many possible causes for deterioration in historic buildings, it may be desirable to retain a consultant, such as a historic architect or architectural conservator, to analyze the building. In addition to determining the most

appropriate solutions to the problems, a consultant can prepare specifications which reflect the particular requirements of each job and can provide oversight of the work in progress. Referrals to preservation consultants frequently can be obtained from State Historic Preservation Offices, the American Institute for Conservation of Historic and Artistic Works (AIC), the Association for Preservation Technology (APT), and local chapters of the American Institute of Architects (AIA).

**Masons practice using lime putty mortar to repair historic marble. Photo: NPS files.**

## Finding an Appropriate Mortar Match

Preliminary research is necessary to ensure that the proposed repointing work is both physically and visually appropriate to the building. Analysis of unweathered portions of the historic mortar to which the new mortar will be matched can suggest appropriate mixes for the repointing mortar so that it will not damage the building because it is excessively strong or vapor impermeable. Examination and analysis of the masonry units--brick, stone or terra cotta--and the techniques used in the original construction will assist in maintaining the building's historic appearance. A simple, non- technical, evaluation of the masonry units and mortar can provide information concerning the relative strength and permeability of each--critical factors in selecting the repointing mortar--while a visual analysis of the historic mortar can provide the information necessary for developing the new mortar mix and application techniques.

**This late 19th century granite has recently been repointed with the joint profile and mortar color carefully matched to the original. Photo: NPS files.**

Although not crucial to a successful repointing project, for projects involving properties of special historic significance, a mortar analysis by a qualified laboratory can be useful by providing information on the original ingredients. However, there are limitations with such an analysis, and replacement mortar specifications should not be based solely on laboratory analysis. Analysis requires interpretation, and there are important factors which affect the condition and performance of the mortar that cannot be established through laboratory analysis. These may include: the original water content, rate of curing, weather conditions during original construction, the method of mixing and placing the mortar, and the cleanliness and condition of the sand. *The most useful information that can come out of laboratory analysis is the identification of sand by gradation and color.* This allows the color and the texture of the mortar to be matched with some accuracy because sand is the largest ingredient by volume.

In creating a repointing mortar that is compatible with the masonry units, the objective is to achieve one that matches the historic mortar as closely as possible, so that the new material can coexist with the old in a sympathetic, supportive and, if necessary, sacrificial capacity. The exact physical and chemical properties of the historic mortar are not of major significance as long as the new mortar conforms to the following criteria:

- The new mortar must match the historic mortar in **color, texture and tooling.** (If a laboratory analysis is undertaken, it may be possible to match the binder components and their proportions with the historic mortar, if those materials are available.)

- The **sand must match the sand** in the historic mortar. (The color and texture of the new mortar will usually fall into place if the sand is matched successfully.)

- The new mortar must have **greater vapor permeability** and be **softer** (measured in compressive strength) than the masonry units.

- The new mortar must be **as vapor permeable** and **as soft or softer** (measured in compressive strength) than the historic mortar. (Softness or hardness is not necessarily an indication of permeability; old, hard lime mortars can still retain high permeability.)

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**This mortar is the proper consistency for repointing historic brick. Photo: John P. Speweik.**

## Mortar Analysis

Methods for analyzing mortars can be divided into two broad categories: **wet chemical** and **instrumental.** Many laboratories that analyze historic mortars use a simple **wet-chemical** method called acid digestion, whereby a sample of the mortar is crushed and then mixed with a dilute acid. The acid dissolves all the carbonate-containing minerals not only in the binder, but also in the aggregate (such as oyster shells, coral sands, or other carbonate-based materials), as well as any other acid-soluble materials. The sand and fine-grained acid-insoluble material is left behind. There are several variations on the simple acid digestion test. One involves collecting the carbon dioxide gas given off as the carbonate is digested by the acid; based on the gas volume the carbnate content of the mortar can be accurately determined (Jedrzejewska, 1960). Simple acid digestion methods are rapid, inexpensive, and easy to perform, but the information they provide about the original composition of a mortar is limited to the color and texture of the sand. The gas collection method provides more information about the binder than a simple acid digestion test.

**Instrumental** analysis methods that have been used to evaluate mortars include polarized light or thin-section microscopy, scanning electron microscopy, atomic absorption spectroscopy, X-ray diffraction, and differential thermal analysis. All instrumental methods require not only expensive, specialized equipment, but also highly-trained experienced analysts. However, instrumental methods can provide much more information about a mortar. Thin-section microscopy is probably the most commonly used instrumental method. Examination of thin slices of a mortar in transmitted light is often used to supplement acid digestion methods, particularly to look for carbonate-based aggregate. For example, the new ASTM test method, ASTM C 1324-96 "Test Method for Examination and Analysis of Hardened Mortars" which was designed specifically for the analysis of modern lime-cement and masonry cement mortars, combines a complex series of wet chemical analyses with thin-section microscopy.

The drawback of most mortar analysis methods is that mortar samples of known composition have not been analyzed in order to evaluate the method. Historic mortars were not prepared to narrowly defined specifications from materials of uniform quality; they contain a wide array of locally derived materials combined at the discretion of the mason. While a particular method might be able to accurately determine the original proportions of a lime-cement-sand mortar prepared from modern materials, the usefulness of that method for evaluating historic mortars is questionable unless it has been tested against mortars prepared from materials more commonly used in the past. **Lorraine Schnabel.**

## Properties of Mortar

Mortars for repointing should be softer or more permeable than the masonry units and no harder or more impermeable than the historic mortar to prevent damage to the masonry units. It is a common error to assume that hardness or high strength is a measure of appropriateness, particularly for lime-based historic mortars. Stresses within a wall caused by expansion, contraction, moisture migration, or settlement must be accommodated in some manner; in a masonry wall, these stresses should be relieved by the mortar rather than by the masonry units. A mortar that is stronger in compressive strength than the masonry units will not "give," thus causing stresses to be relieved through the masonry units--resulting in permanent damage to the masonry, such as cracking and spalling, that cannot be repaired easily.

**This early 19th century building is being repointed with lime mortar. Photo: Travis McDonald.**

While stresses can also break the bond between the mortar and the masonry units, permitting water to penetrate the resulting hairline cracks, this is easier to correct in the joint through repointing than if the break occurs in the masonry units.

Permeability, or rate of vapor transmission, is also critical. High lime mortars are more permeable than denser cement mortars. Historically, mortar acted as a bedding material--not unlike an expansion joint--rather than a "glue" for the masonry units, and moisture was able to migrate through the mortar joints rather than the masonry units. When moisture evaporates from the masonry it deposits any soluble salts either on the surface as *efflorescence* or below the surface as *subflorescence.* While salts deposited on the surface of masonry units are usually relatively harmless, salt crystallization within a masonry unit creates pressure that can cause parts ofthe outer surface to spall off or delaminate. If the mortar does not permitmoisture or moisture vapor to migrate out of the wall and evaporate, theresult will be damage to the masonry units.

## Components of Mortar

**Sand.** Sand is the largest component of mortar and the material that gives mortar its distinctive color, texture and cohesiveness. Sand must be free of impurities, such as salts or clay. The three key characteristics of sand are: particle shape, gradation and void ratios.

When viewed under a magnifying glass or low-power microscope, particles of sand generally have either rounded edges, such as found in beach and river sand, or sharp, angular edges, found in crushed or manufactured sand. For repointing mortar, rounded or natural sand is preferred for two reasons. It is usually similar to the sand in the historic mortar and provides a better visual match. It also has better working qualities or plasticity and can thus be forced into the joint more easily, forming a good contact with the remaining historic mortar and the surface of the adjacent masonry units. Although manufactured sand is frequently more readily available, it is usually possible to locate a supply of rounded sand.

The gradation of the sand (particle size distribution) plays a very important role in the durability and cohesive properties of a mortar. Mortar must have a certain percentage of large to small particle sizes in order to deliver the optimum performance. Acceptable

guidelines on particle size distribution may be found in ASTM C 144 (American Society for Testing and Materials). However, in actuality, since neither historic nor modern sands are always in compliance with ASTM C 144, matching the same particle appearance and gradation usually requires sieving the sand.

A scoop of sand contains many small voids between the individual grains. A mortar that performs well fills all these small voids with binder (cement/lime combination or mix) in a balanced manner. Well-graded sand generally has a 30 per cent void ratio by volume. Thus, 30 per cent binder by volume generally should be used, unless the historic mortar had a different binder: aggregate ratio. This represents the 1:3 binder to sand ratios often seen in mortar specifications.

For repointing, sand generally should conform to ASTM C 144 to assure proper gradation and freedom from impurities; some variation may be necessary to match the original size and gradation. Sand color and texture also should match the original as closely as possible to provide the proper color match without other additives.

**Lime.** Mortar formulations prior to the late-19th century used lime as the primary binding material. Lime is derived from heating limestone at high temperatures which burns off the carbon dioxide, and turns the limestone into quicklime. There are three types of limestone--calcium, magnesium, and dolomitic--differentiated by the different levels of magnesium carbonate they contain which impart specific qualities to mortar. Historically, calcium lime was used for mortar rather than the dolomitic lime (calcium magnesium carbonate) most often used today. But it is also important to keep in mind the fact that the historic limes, and other components of mortar, varied a great deal because they were natural, as opposed to modern lime which is manufactured and, therefore, standardized. Because some of the kinds of lime, as well as other components of mortar, that were used historically are no longer readily available, even when a conscious effort is made to replicate a "historic" mix, this may not be achievable due to the differences between modern and historic materials.

**Caulking was inappropriately used here in place of mortar on the top of the wall. As a result, it has not been durable. Photo: NPS files.**

Lime, itself, when mixed with water into a paste is very plastic and creamy. It will remain workable and soft indefinitely, if stored in a sealed container. Lime (calcium hydroxide) hardens by carbonation absorbing carbon dioxide primarily from the air, converting itself to calcium carbonate. Once a lime and sand mortar is mixed and placed in a wall, it begins the process of carbonation. If lime mortar is left to dry too rapidly, carbonation of the mortar will be reduced, resulting in poor adhesion and poor durability. In addition, lime mortar is slightly water soluble and thus is able to re-seal any hairline cracks that may develop during the life of the mortar. Lime mortar is soft, porous, and changes little in volume during temperature fluctuations thus making it a good choice for historic buildings. *Because of these qualities, high calcium lime mortar may be considered for many repointing projects, not just those involving historic buildings.*

For repointing, lime should conform to ASTM C 207, Type S, or Type SA, Hydrated Lime for Masonry Purposes. This machine-slaked lime is designed to assure high plasticity and water retention. The use of quicklime which must be slaked and soaked by hand may have advantages over hydrated lime in some restoration projects if time and money allow.

**Lime putty.** Lime putty is slaked lime that has a putty or paste-like consistency. It should conform to ASTM C 5. Mortar can be mixed using lime putty according to ASTM C

270 property or proportion specification.

**Portland cement.** More recent, 20th-century mortar has used portland cement as a primary binding material. A straight portland cement and sand mortar is extremely hard, resists the movement of water, shrinks upon setting, and undergoes relatively large thermal movements. When mixed with water, portland cement forms a harsh, stiff paste that is quite unworkable, becoming hard very quickly. (Unlike lime, portland cement will harden regardless of weather conditions and does not require wetting and drying cycles.) Some portland cement assists the workability and plasticity of the mortar without adversely affecting the finished project; it also provides early strength to the mortar and speeds setting. Thus, it may be appropriate to add some portland cement to an essentially lime-based mortar even when repointing relatively soft 18th or 19th century brick under some circumstances when a slightly harder mortar is required. The more portland cement that is added to a mortar formulation the harder it becomes--and the faster the initial set.

For repointing, portland cement should conform to ASTM C 150. White, non- staining portland cement may provide a better color match for some historic mortars than the more commonly available grey portland cement. But, it should not be assumed, however, that white portland cement is always appropriate for all historic buildings, since the original mortar may have been mixed with grey cement. The cement should not have more than 0.60 per cent alkali to help avoid efflorescence.

**Masonry cement.** Masonry cement is a preblended mortar mix commonly found at hardware and home repair stores. It is designed to produce mortars with a compressive strength of 750 psi or higher when mixed with sand and water at the job site. It may contain hydrated lime, but it always contains a large amount of portland cement, as well as ground limestone and other workability agents, including air-entraining agents. Because masonry cements are not required to contain hydrated lime, and generally do not contain lime, they produce high strength mortars that can damage historic masonry. *For this reason, they generally are not recommended for use on historic masonry buildings.*

**Lime mortar (pre-blended).** Hydrated lime mortars, and pre-blended lime putty mortars with or without a matched sand are commercially available. Custom mortars are also available with color. In most instances, pre-blended lime mortars containing sand may not provide an exact match; however, if the project calls for total repointing, a pre-blended lime mortar may be worth considering as long as the mortar is compatible in strength with the masonry. If the project involves only selected, "spot" repointing, then it may be better to carry out a mortar analysis which can provide a custom pre-blended lime mortar with a matching sand. In either case, if a preblended lime mortar is to be used, it should contain Type S or SA hydrated lime conforming to ASTM C 207.

**Water.** Water should be potable--clean and free from acids, alkalis, or other dissolved organic materials.

## Other Components

**Historic components.** In addition to the color of the sand, the texture of the mortar is of critical importance in duplicating historic mortar. Most mortars dating from the mid-19th century on--with some exceptions--have a fairly homogeneous texture and color. Some earlier mortars are not as uniformly textured and may contain lumps of partially burned lime or "dirty lime", shell (which often provided a source of lime, particularly in coastal areas), natural cements, pieces of clay, lampblack or other pigments, or even animal hair. The visual characteristics of these mortars can be duplicated through the use of similar materials in the repointing mortar.

Replicating such unique or individual mortars will require writing new specifications for

each project. If possible, suggested sources for special materials should be included. For example, crushed oyster shells can be obtained in a variety of sizes from poultry supply dealers.

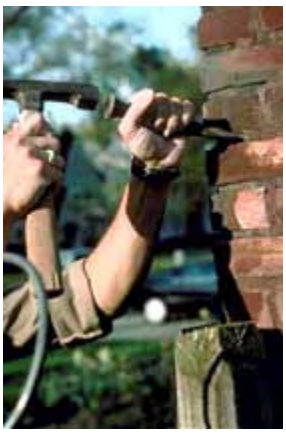
**Pigments.** Some historic mortars, particularly in the late 19th century, were tinted to match or contrast with the brick or stone. Red pigments, sometimes in the form of brick dust, as well as brown, and black pigments were commonly used. Modern pigments are available which can be added to the mortar at the job site, but they should not exceed 10 per cent by weight of the portland cement in the mix, and carbon black should be limited to 2 per cent. Only synthetic mineral oxides, which are alkali-proof and sun-fast, should be used to prevent bleaching and fading.

**Modern components.** Admixtures are used to create specific characteristics in mortar, and whether they should be used will depend upon the individual project. *Air entraining agents*, for example, help the mortar to resist freeze-thaw damage in northern climates. *Accelerators* are used to reduce mortar freezing prior to setting while *retarders* help to extend the mortar life in hot climates. Selection of admixtures should be made by the architect or architectural conservator as part of the specifications, not something routinely added by the masons.

Generally, modern chemical additives are unnecessary and may, in fact, have detrimental effects in historic masonry projects. The use of antifreeze compounds is not recommended. They are not very effective with high lime mortars and may introduce salts, which may cause efflorescence later. A better practice is to warm the sand and water, and to protect the completed work from freezing. No definitive study has determined whether air-entraining additives should be used to resist frost action and enhance plasticity, but in areas of extreme exposure requiring high-strength mortars with lower permeability, air-entrainment of 10-16 percent may be desirable (see formula for "severe weather exposure" in **Mortar Type and Mix**). Bonding agents are not a substitute for proper joint preparation, and they should generally be avoided. If the joint is properly prepared, there will be a good bond between the new mortar and the adjacent surfaces. In addition, a bonding agent is difficult to remove if smeared on a masonry surface.

## Mortar Type and Mix

Mortars for repointing projects, especially those involving historic buildings, typically are custom mixed in order to ensure the proper physical and visual qualities. These materials can be combined in varying proportions to create a mortar with the desired performance and durability. The actual specification of a particular mortar type should take into consideration all of the factors affecting the life of the building including: current site conditions, present condition of the masonry, function of the new mortar, degree of weather exposure, and skill of the mason. Thus, no two repointing projects are exactly the same. Modern materials specified for use in repointing mortar should conform to specifications of the American Society for Testing and Materials (ASTM) or comparable federal specifications, and the resulting mortar should conform to ASTM C 270, Mortar for Unit Masonry.



**Here, a hammer and chisel are being**

Specifying the proportions for the repointing mortar for a specific job is not as difficult as it might seem. Five mortar types, each with a corresponding recommended mix, have been established by ASTM to distinguish high strength mortar from soft flexible mortars. The ASTM designated them in decreasing order of approximate general strength as Type M (2,500 psi), Type S (1,800 psi), Type N (750 psi), Type O (350 psi) and Type K (75 psi). (The letters identifying the types are from the words MASON WORK using every other letter.) Type K has the highest lime

**correctly used to prepare a joint for repointing. Photo: John P. Speweik.**

content of the mixes that contain portland cement, although it is seldom used today, except for some historic preservation projects. The designation "L" in the accompanying chart identifies a straight lime and sand mix. Specifying the appropriate ASTM mortar by proportion of ingredients, will ensure the desired physical properties. Unless specified otherwise, measurements or proportions for mortar mixes are always given in the following order: cement-lime-sand. Thus, a Type K mix, for example, would be referred to as 1-3-10, or 1 part cement to 3 parts lime to 10 parts sand. Other requirements to create the desired visual qualities should be included in the specifications.

The strength of a mortar can vary. If mixed with higher amounts of portland cement, a harder mortar is obtained. The more lime that is added, the softer and more plastic the mortar becomes, increasing its workability. A mortar strong in compressive strength might be desirable for a hard stone (such as granite) pier holding up a bridge deck, whereas a softer, more permeable lime mortar would be preferable for a historic wall of soft brick. Masonry deterioration caused by salt deposition results when the mortar is less permeable than the masonry unit. A strong mortar is still more permeable than hard, dense stone. However, in a wall constructed of soft bricks where the masonry unit itself has a relatively high permeability or vapor transmission rate, a soft, high lime mortar is necessary to retain sufficient permeability.

## Budgeting and Scheduling

Repointing is both expensive and time consuming due to the extent of handwork and special materials required. It is preferable to repoint only those areas that require work rather than an entire wall, as is often specified. But, if 25 to 50 per cent or more of a wall needs to be repointed, repointing the entire wall may be more cost effective than spot repointing. Total repointing may also be more sensible when access is difficult, requiring the erection of expensive scaffolding (unless the majority of the mortar is sound and unlikely to require replacement in the foreseeable future). Each project requires judgement based on a variety of factors. Recognizing this at the outset will help to prevent many jobs from becoming prohibitively expensive.

**When repairing this stone wall, the mason matched the raised profile of the original tuckpointing. Photo: NPS files.**

In scheduling, seasonal aspects need to be considered first. Generally speaking, wall temperatures between 40 and 95 degrees F (8 and 38 degrees C) will prevent freezing or excessive evaporation of the water in the mortar. Ideally, repointing should be done in shade, away from strong sunlight in order to slow the drying process, especially during hot weather. If necessary, shade can be provided for large-scale projects with appropriate modifications to scaffolding.

The relationship of repointing to other work proposed on the building must also be recognized. For example, if paint removal or cleaning is anticipated, and if the mortar joints are basically sound and need only selective repointing, it is generally better to postpone repointing until after completion of these activities. However, if the mortar has eroded badly, allowing moisture to penetrate deeply into the wall, repointing should be accomplished before cleaning. Related work, such as structural or roof repairs, should be scheduled so that they do not interfere with repointing and so that all work can take maximum advantage of erected scaffolding.

Building managers also must recognize the difficulties that a repointing project can create. The process is time consuming, and scaffolding may need to remain in place for an extended period of time. The joint preparation process can be quite noisy and can generate large quantities of dust which must be controlled, especially at air intakes to protect human health, and also where it might damage operating machinery. Entrances may be blocked from time to time making access difficult for both building tenants and visitors. Clearly, building managers will need to coordinate the repointing work with other events at the site.

**A mechanical grinder improperly used to cut out the horizontal joint and incompatible repointing have seriously damaged the 19th century brick. Photo: NPS files.**

## Contractor Selection

The ideal way to select a contractor is to ask knowledgeable owners of recently repointed historic buildings for recommendations. Qualified contractors then can provide lists of other repointing projects for inspection. More commonly, however, the contractor for a repointing project is selected through a competitive bidding process over which the client or consultant has only limited control. In this situation it is important to ensure that the specifications stipulate that masons must have a minimum of five years' experience with repointing historic masonry buildings to be eligible to bid on the project. Contracts are awarded to the lowest responsible bidder, and bidders who have performed poorly on other projects usually can be eliminated from consideration on this basis, even if they have the lowest prices.

The contract documents should call for unit prices as well as a base bid. Unit pricing forces the contractor to determine in advance what the cost addition or reduction will be for work which varies from the scope of the base bid. If, for example, the contractor has fifty linear feet less of stone repointing than indicated on the contract documents but thirty linear feet more of brick repointing, it will be easy to determine the final price for the work. Note that each type of work--brick repointing, stone repointing, or similar items--will have its own unit price. The unit price also should reflect quantities; one linear foot of pointing in five different spots will be more expensive than five contiguous linear feet.

## Execution of the Work

**Test Panels.** These panels are prepared by the contractor using the same techniques that will be used on the remainder of the project. Several panel locations--preferably not on the front or other highly visible location of the building--may be necessary to include all types of masonry, joint styles, mortar colors, and other problems likely to be encountered on the job. If cleaning tests, for example, are also to be undertaken, they should be carried out in the same location. Usually a 3 foot by 3 foot area is sufficient for brickwork, while a somewhat larger area may be required for stonework. These panels establish an acceptable standard of work and serve as a benchmark for evaluating and accepting subsequent work on the building.

**Unskilled repointing has**

**Joint Preparation.** Old mortar should be removed to a minimum depth of 2 to 2-1/2 times the width of the joint to ensure an adequate bond and to prevent mortar "popouts." For most brick joints, this will require removal of the mortar to a depth of approximately ½ to 1 inch; for stone masonry with wide joints, mortar may need to be removed to a depth of several inches. Any loose or disintegrated mortar beyond this minimum depth also should be removed.

**negatively impacted the character of this late-19th century building. Photo: NPS files.**

Although some damage may be inevitable, careful joint preparation can help limit damage to masonry units. The traditional manner of removing old mortar is through the use of hand chisels and mash hammers. Though labor-intensive, in most instances this method poses the least threat for damage to historic masonry units and produces the best final product.

The most common method of removing mortar, however, is through the use of power saws or grinders. The use of power tools by unskilled masons can be disastrous for historic masonry, particularly soft brick. Using power saws on walls with thin joints, such as most brick walls, almost always will result in damage to the masonry units by breaking the edges and by overcutting on the head, or vertical joints.

However, small pneumatically-powered chisels generally can be used safely and effectively to remove mortar on historic buildings as long as the masons maintain appropriate control over the equipment. Under certain circumstances, thin diamond-bladed grinders may be used to cut out *horizontal* joints only on hard portland cement mortar common to most early-20th century masonry buildings. Usually, automatic tools most successfully remove old mortar without damaging the masonry units when they are used in combination with hand tools in preparation for repointing. Where horizontal joints are uniform and fairly wide, it may be possible to use a power masonry saw to assist the removal of mortar, such as by cutting along the middle of the joint; final mortar removal from the sides of the joints still should be done with a hand chisel and hammer. Caulking cutters with diamond blades can sometimes be used successfully to cut out joints without damaging the masonry. Caulking cutters are slow; they do not rotate, but vibrate at very high speeds, thus minimizing the possibility of damage to masonry units. Although mechanical tools may be safely used in limited circumstances to cut out horizontal joints in preparation for repointing, they should never be used on vertical joints because of the danger of slipping and cutting into the brick above or below the vertical joint. Using power tools to remove mortar without damaging the surrounding masonry units also necessitates highly skilled masons experienced in working on historic masonry buildings. Contractors should demonstrate proficiency with power tools before their use is approved.

Using any of these power tools may also be more acceptable on hard stone, such as quartzite or granite, than on terra cotta with its glass-like glaze, or on soft brick or stone. The test panel should determine the acceptability of power tools. If power tools are to be permitted, the contractor should establish a quality control program to account for worker fatigue and similar variables.

Mortar should be removed cleanly from the masonry units, leaving square corners at the back of the cut. Before filling, the joints should be rinsed with a jet of water to remove all loose particles and dust. At the time of filling, the joints should be damp, but with no standing water present. For masonry walls--limestone, sandstone and common brick--that are extremely absorbent, it is recommended that a continual mist of water be applied for a few hours before repointing begins.

**Mortar Preparation.** Mortar components should be measured and mixed carefully to assure the uniformity of visual and physical characteristics. Dry ingredients are measured by volume and thoroughly mixed before the addition of any water. Sand must be added in a damp, loose condition to avoid over sanding. Repointing mortar is typically pre-hydrated by adding water so it will just hold together, thus allowing it to stand for a period of time before the final water is added. Half the water should be added, followed by mixing for approximately 5 minutes. The remaining water should then be added in small portions until a mortar of the desired consistency is reached. The total volume of water necessary may vary from batch to batch, depending on weather conditions. It is important to keep the water to a minimum for two reasons: first, a drier mortar is cleaner to work with, and it can be compacted tightly into the joints; second, with no excess water to evaporate, the mortar cures without shrinkage cracks. Mortar should be

used within approximately 30 minutes of final mixing, and "retempering," or adding more water, should not be permitted.

**Using Lime Putty to Make Mortar.** Mortar made with lime putty and sand, sometimes referred to as roughage or course stuff, should be measured by volume, and may require slightly different proportions from those used with hydrated lime. No additional water is usually needed to achieve a workable consistency because enough water is already contained in the putty. Sand is proportioned first, followed by the lime putty, then mixed for five minutes or until all the sand is thoroughly coated with the lime putty. But mixing, in the familiar sense of turning over with a hoe, sometimes may not be sufficient if the best possible performance is to be obtained from a lime putty mortar. Although the old practice of chopping, beating and ramming the mortar has largely been forgotten, recent field work has confirmed that lime putty and sand rammed and beaten with a wooden mallet or ax handle, interspersed by chopping with a hoe, can significantly improve workability and performance. The intensity of this action increases the overall lime/sand contact and removes any surplus water by compacting the other ingredients. It may also be advantageous for larger projects to use a mortar pan mill for mixing. Mortar pan mills which have a long tradition in Europe produce a superior lime putty mortar not attainable with today's modern paddle and drum type mixers.

For larger repointing projects the lime putty and sand can be mixed together ahead of time and stored indefinitely, on or off site, which eliminates the need for piles of sand on the job site. This mixture, which resembles damp brown sugar, must be protected from the air in sealed containers with a wet piece of burlap over the top or sealed in a large plastic bag to prevent evaporation and premature carbonation. The lime putty and sand mixture can be recombined into a workable plastic state months later with no additional water.

If portland cement is specified in a lime putty and sand mortar--Type O (1:2:9) or Type K (1:3:11)--the portland cement should first be mixed into a slurry paste before adding it to the lime putty and sand. Not only will this ensure that the portland cement is evenly distributed throughout the mixture, but if dry portland cement is added to wet ingredients it tends to "ball up," jeopardizing dispersion. (Usually water must be added to the lime putty and sand anyway once the portland cement is introduced.) Any color pigments should be added at this stage and mixed for a full five minutes. The mortar should be used within 30 minutes to 1½ hours and it should not be retempered. Once portland cement has been added the mortar can no longer be stored.

**Filling the Joint.** Where existing mortar has been removed to a depth of greater than 1 inch, these deeper areas should be filled first, compacting the new mortar in several layers. The back of the entire joint should be filled successively by applying approximately 1/4 inch of mortar, packing it well into the back corners. This application may extend along the wall for several feet. As soon as the mortar has reached thumb-print hardness, another 1/4 inch layer of mortar--approximately the same thickness--may be applied. Several layers will be needed to fill the joint flush with the outer surface of the masonry. It is important to allow each layer time to harden before the next layer is applied; most of the mortar shrinkage occurs during the hardening process and layering thus minimizes overall shrinkage.

When the final layer of mortar is thumb-print hard, the joint should be tooled to match the historic joint. Proper timing of the tooling is important for uniform color and appearance. If tooled when too soft, the color will be lighter than expected, and hairline cracks may occur; if tooled when too hard, there may be dark streaks called "tool burning," and good closure of the mortar against the masonry units will not be achieved.

If the old bricks or stones have worn, rounded edges, it is best to recess the final mortar slightly from the face of the masonry. This treatment will help avoid a joint which is visually wider than the actual joint; it also will avoid creation of a large, thin featheredge which is easily damaged, thus admitting water. After tooling, excess mortar can be

removed from the edge of the joint by brushing with a natural bristle or nylon brush. Metal bristle brushes should never be used on historic masonry.

**Curing Conditions.** The preliminary hardening of high-lime content mortars--those mortars that contain more lime by volume than portland cement, i.e., Type O (1:2:9), Type K (1:3:11), and straight lime/sand, Type "L" (0:1:3)--takes place fairly rapidly as water in the mix is lost to the porous surface of the masonry and through evaporation. A high lime mortar (especially Type "L") left to dry out too rapidly can result in chalking, poor adhesion, and poor durability. Periodic wetting of the repointed area after the mortar joints are thumb-print hard and have been finish tooled may significantly accelerate the carbonation process. When feasible, misting using a hand sprayer with a fine nozzle can be simple to do for a day or two after repointing. Local conditions will dictate the frequency of wetting, but initially it may be as often as every hour and gradually reduced to every three or four hours. Walls should be covered with burlap for the first three days after repointing. (Plastic may be used, but it should be tented out and not placed directly against the wall.) This helps keep the walls damp and protects them from direct sunlight. Once carbonation of the lime has begun, it will continue for many years and the lime will gain strength as it reverts back to calcium carbonate within the wall.

***Aging* the Mortar.** Even with the best efforts at matching the existing mortar color, texture, and materials, there will usually be a visible difference between the old and new work, partly because the new mortar has been matched to the unweathered portions of the historic mortar. Another reason for a slight mismatch may be that the sand is more exposed in old mortar due to the slight erosion of the lime or cement. Although spot repointing is generally preferable and some color difference should be acceptable, if the difference between old and new mortar is too extreme, it may be advisable in some instances to repoint an entire area of a wall, or an entire feature such as a bay, to minimize the difference between the old and the new mortar. If the mortars have been properly matched, usually the best way to deal with surface color differences is to let the mortars age naturally. Other treatments to overcome these differences, including cleaning the non-repointed areas or staining the new mortar, should be carefully tested prior to implementation.

**This 18th century pediment and surrounding wall exhibit distinctively different mortar joints. Photo: NPS files.**

Staining the new mortar to achieve a better color match is generally not recommended, but it may be appropriate in some instances. Although staining may provide an initial match, the old and new mortars may weather at different rates, leading to visual differences after a few seasons. In addition, the mixtures used to stain the mortar may be harmful to the masonry; for example, they may introduce salts into the masonry which can lead to efflorescence.

**Cleaning the Repointed Masonry.** If repointing work is carefully executed, there will be little need for cleaning other than to remove the small amount of mortar from the edge of the joint following tooling. This can be done with a stiff natural bristle or nylon brush after the mortar has dried, but before it is initially set (1-2 hours). Mortar that has hardened can usually be removed with a wooden paddle or, if necessary, a chisel.

Further cleaning is best accomplished with plain water and natural bristle or nylon brushes. If chemicals must be used, they should be selected with extreme caution. Improper cleaning can lead to deterioration of the masonry units, deterioration of the mortar, mortar smear, and efflorescence. New mortar joints are especially susceptible to damage because they do not become fully cured for several months. Chemical cleaners, particularly acids, should never be used on dry masonry. The masonry should always be

completely soaked once with water before chemicals are applied. After cleaning, the walls should be flushed again with plain water to remove all traces of the chemicals.

Several precautions should be taken if a freshly repointed masonry wall is to be cleaned. First, the mortar should be fully hardened before cleaning. Thirty days is usually sufficient, depending on weather and exposure; as mentioned previously, the mortar will continue to cure even after it has hardened. Test panels should be prepared to evaluate the effects of different cleaning methods. Generally, on newly repointed masonry walls, only very low pressure (100 psi) water washing supplemented by stiff natural bristle or nylon brushes should be used, except on glazed or polished surfaces, where only soft cloths should be used.**

New construction "bloom" or efflorescence occasionally appears within the first few months of repointing and usually disappears through the normal process of weathering. If the efflorescence is not removed by natural processes, the safest way to remove it is by dry brushing with stiff natural or nylon bristle brushes followed by wet brushing. Hydrochloric (muriatic) acid, is generally ineffective, and it should not be used to remove efflorescence. It may liberate additional salts, which, in turn, can lead to more efflorescence.

**Surface Grouting** is sometimes suggested as an alternative to repointing brick buildings, in particular. This process involves the application of a thin coat of cement-based grout to the mortar joints and the mortar/brick interface. To be effective, the grout must extend slightly onto the face of the masonry units, thus widening the joint visually. The change in the joint appearance can alter the historic character of the structure to an unacceptable degree. In addition, although masking of the bricks is intended to keep the grout off the remainder of the face of the bricks, some level of residue, called "veiling," will inevitably remain. Surface grouting cannot substitute for the more extensive work of repointing, and it is not a recommended treatment for historic masonry.

***Additional information on masonry cleaning is presented in Preservation Briefs 1: Assessing Cleaning and Water-Repellent Treatments for Historic Masonry Buildings, Robert C. Mack, FAIA, and Anne Grimmer, Washington, D.C.: Technical Preservation Services, National Park Service, U.S. Department of the Interior, 2000; and Keeping it Clean: Removing Exterior Dirt, Paint, Stains & Graffiti from Historic Masonry Buildings, Anne E. Grimmer, Washington, D.C.: Technical Preservation Services, National Park Service, U.S. Department of the Interior, 1988.*

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## Visually Examining the Mortar and the Masonry Units

A simple *in situ* comparison will help determine the hardness and condition of the mortar and the masonry units. Begin by scraping the mortar with a screwdriver, and gradually tapping harder with a cold chisel and mason's hammer. Masonry units can be tested in the same way beginning, even more gently, by scraping with a fingernail. This relative analysis which is derived from the 10-point hardness scale used to describe minerals, provides a good starting point for selection of an appropriate mortar. It is described more fully in "The Russack System for Brick & Mortar Description" referenced in **Selected Reading** at the end of this Brief.

Mortar samples should be chosen carefully, and picked from a variety of locations on the building to find unweathered mortar, if possible. Portions of the building may have been repointed in the past while other areas may be subject to conditions causing unusual deterioration. There may be several colors of mortar dating from different construction periods or sand used from different sources during the initial construction. Any of these situations can give false readings to the visual or physical characteristics required for the

new mortar. Variations should be noted which may require developing more than one mix.

1) Remove with a chisel and hammer three or four unweathered samples of the mortar to be matched from several locations on the building. (Set the largest sample aside--this will be used later for comparison with the repointing mortar). Removing a full representation of samples will allow selection of a "mean" or average mortar sample.

2) Mash the remaining samples with a wooden mallet, or hammer if necessary, until they are separated into their constituent parts. There should be a good handful of the material.

3) Examine the powdered portion--the lime and/or cement matrix of the mortar. Most particularly, note the color. There is a tendency to think of historic mortars as having white binders, but grey portland cement was available by the last quarter of the 19th century, and traditional limes were also sometimes grey. Thus, in some instances, the natural color of the historic binder may be grey, rather than white. The mortar may also have been tinted to create a colored mortar, and this color should be identified at this point.

4) Carefully blow away the powdery material (the lime and/or cement matrix which bound the mortar together).

5) With a low power (10 power) magnifying glass, examine the remaining sand and other materials such as lumps of lime or shell.

6) Note and record the wide range of color as well as the varying sizes of the individual grains of sand, impurities, or other materials.

## Other Factors to Consider

**Color.** Regardless of the color of the binder or colored additives, the sand is the primary material that gives mortar its color. A surprising variety of colors of sand may be found in a single sample of historic mortar, and the different sizes of the grains of sand or other materials, such as incompletely ground lime or cement, play an important role in the texture of the repointing mortar. Therefore, when specifying sand for repointing mortar, it may be necessary to obtain sand from several sources and to combine or screen them in order to approximate the range of sand colors and grain sizes in the historic mortar sample.

**Pointing Style.** Close examination of the historic masonry wall and the techniques used in the original construction will assist in maintaining the visual qualities of the building. Pointing styles and the methods of producing them should be examined. It is important to look at both the horizontal and the vertical joints to determine the order in which they were tooled and whether they were the same style. Some late-19th and early-20th century buildings, for example, have horizontal joints that were raked back while the vertical joints were finished flush and stained to match the bricks, thus creating the illusion of horizontal bands. Pointing styles may also differ from one facade to another; front walls often received greater attention to mortar detailing than side and rear walls. **Tuckpointing** is not true repointing but the application of a raised joint or lime putty joint on top of flush mortar joints. **Penciling** is a purely decorative, painted surface treatment over a mortar joint, often in a contrasting color.

**Masonry Units.**The masonry units should also be examined so that any replacement units will match the historic masonry. Within a wall there may be a wide range of colors, textures, and sizes, particularly with hand-made brick or rough-cut, locally-quarried stone. Replacement units should blend in with the full range of masonry units rather than a single brick or stone.

**Matching Color and Texture of the Repointing Mortar**

New mortar should match the unweathered interior portions of the historic mortar. The simplest way to check the match is to make a small sample of the proposed mix and allow it to cure at a temperature of approximately 70 degrees F for about a week, or it can be baked in an oven to speed up the curing; this sample is then broken open and the surface is compared with the surface of the largest "saved" sample of historic mortar.

If a proper color match cannot be achieved through the use of natural sand or colored aggregates like crushed marble or brick dust, it may be necessary to use a modern mortar pigment.

During the early stages of the project, it should be determined how closely the new mortar should match the historic mortar. Will "quite close" be sufficient, or is "exactly" expected? The specifications should state this clearly so that the contractor has a reasonable idea how much time and expense will be required to develop an acceptable match.

The same judgment will be necessary in matching replacement terra cotta, stone or brick. If there is a known source for replacements, this should be included in the specifications. If a source cannot be determined prior to the bidding process, the specifications should include an estimated price for the replacement materials with the final price based on the actual cost to the contractor.

**Mortar Types**
(Measured by volume)

| Designation | Cement | Hydrated Lime or Lime Putty | Sand |
|---|---|---|---|
| M | 1 | 1/4 | 3 - 3 3/4 |
| S | 1 | 1/2 | 4 - 4 1/2 |
| N | 1 | 1 | 5 - 6 |
| O | 1 | 2 | 8 - 9 |
| K | 1 | 3 | 10 - 12 |
| "L" | 0 | 1 | 2 1/4 - 3 |

**Suggested Mortar Types for Different Exposures**

| | Exposure | | |
|---|---|---|---|
| Masonry Material | Sheltered | Moderate | Severe |
| Very durable:<br>granite, hard-cored brick, etc. | O | N | S |
| Moderately durable:<br>limestone, durable stone, molded brick | K | O | N |
| Minimally durable:<br>soft hand-made brick | "L" | K | O |

## Summary

**For the Owner/Administrator.** The owner or administrator of a historic building should remember that repointing is likely to be a lengthy and expensive process. First, there must be adequate time for evaluation of the building and investigation into the

cause of problems. Then, there will be time needed for preparation of the contract documents. The work itself is precise, time-consuming and noisy, and scaffolding may cover the face of the building for some time. Therefore, the owner must carefully plan the work to avoid problems. Schedules for both repointing and other activities will thus require careful coordination to avoid unanticipated conflicts. The owner must avoid the tendency to rush the work or cut corners if the historic building is to retain its visual integrity and the job is to be durable.

**For the Architect/Consultant.** Because the primary role of the consultant is to ensure the life of the building, a knowledge of historic construction techniques and the special problems found in older buildings is essential. The consultant must assist the owner in planning for logistical problems relating to research and construction. It is the consultant's responsibility to determine the cause of the mortar deterioration and ensure that it is corrected before the masonry is repointed. The consultant must also be prepared to spend more time in project inspections than is customary in modern construction.

**For the Masons.** Successful repointing depends on the masons themselves. Experienced masons understand the special requirements for work on historic buildings and the added time and expense they require. The entire masonry crew must be willing and able to perform the work in conformance with the specifications, even when the specifications may not be in conformance with standard practice. At the same time, the masons should not hesitate to question the specifications if it appears that the work specified would damage the building.

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## Conclusion

A good repointing job is meant to last, at least 30 years, and preferably 50- 100 years. Shortcuts and poor craftsmanship result not only in diminishing the historic character of a building, but also in a job that looks bad, and will require future repointing sooner than if the work had been done correctly. The mortar joint in a historic masonry building has often been called a wall's "first line of defense." Good repointing practices guarantee the long life of the mortar joint, the wall, and the historic structure. Although careful maintenance will help preserve the freshly repointed mortar joints, it is important to remember that mortar joints are intended to be sacrificial and will probably require repointing some time in the future. Nevertheless, if the historic mortar joints proved durable for many years, then careful repointing should have an equally long life, ultimately contributing to the preservation of the entire building.

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## Useful Addresses

Brick Institute of America
11490 Commerce Park Drive

Reston, VA 22091

National Lime Association
200 N. Glebe Road, Suite 800
Arlington, VA 22203

Portland Cement Association
5420 Old Orchard Road
Skokie, IL 60077

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**Robert C. Mack, FAIA**, is a principal in the firm of MacDonald & Mack, Architects, Ltd., an architectural firm that specializes in historic buildings in Minneapolis, Minnesota. **John P. Speweik, CSI,** Toledo, Ohio, is a 5th-generation stonemason, and principal in U.S. Heritage Group, Inc., Chicago, Illinois, which does custom historic mortar matching. **Anne Grimmer,** Senior Architectural Historian, Heritage Preservation Services Program, National Park Service, was responsible for developing and coordinating the revision of this Preservation Brief, incorporating professional comments, and the technical editing.

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**Washington, D.C. October, 1998**

**Home page logo: Soft mortar for repointing. Photo: John P. Speweik.**

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*This publication has been prepared pursuant to the National Historic Preservation Act of 1966, as amended, which directs the Secretary of the Interior to develop and make available information concerning historic properties. Technical Preservation Services (TPS), Heritage Preservation Services Division, National Park Service prepares standards, guidelines, and other educational materials on responsible historic preservation treatments for a broad public.*

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Attachment 13.19

# CHIMNEY FLASHING

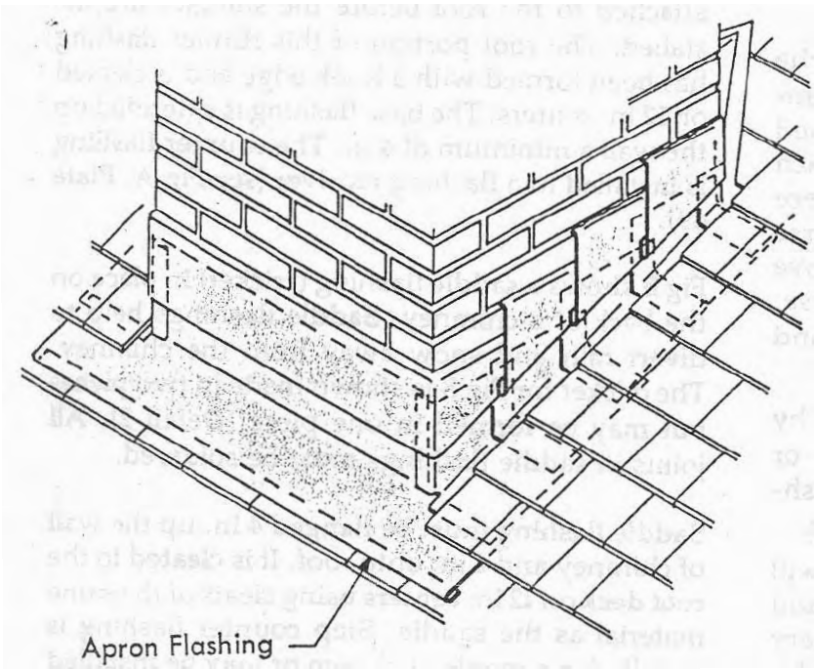
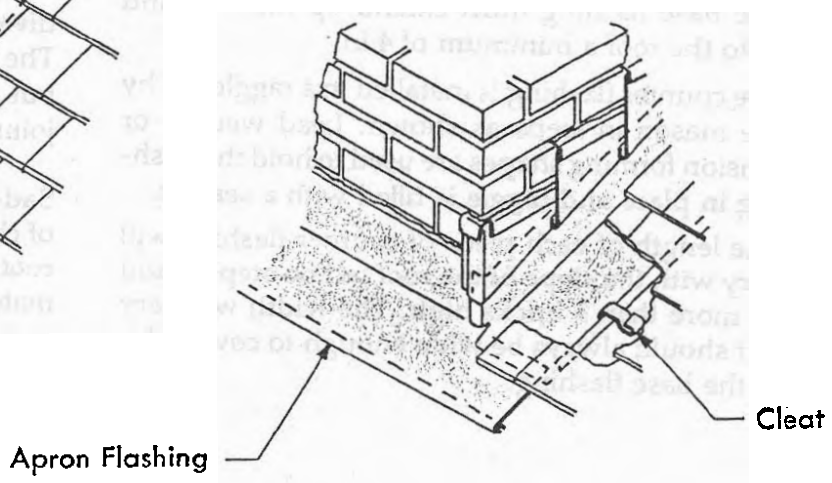



**FIG A**




**DETAIL 1**

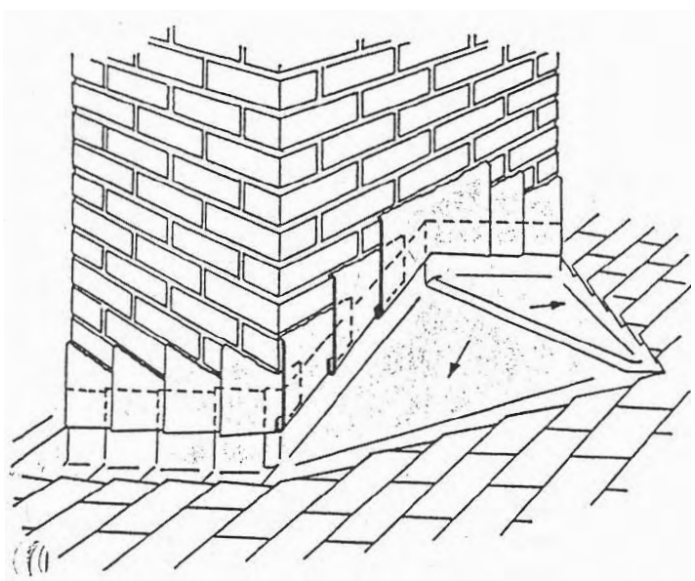
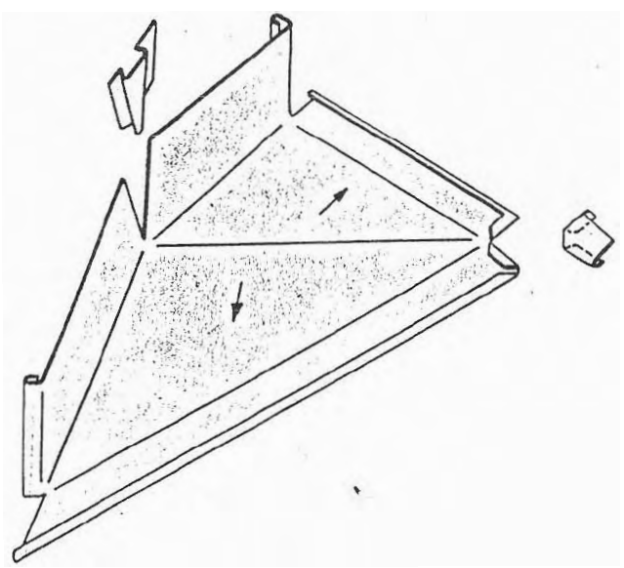


**FIG B**



**DETAIL 2**



SMACNA Architectural Manual
3rd Edition pp. 28,29

Plate 62 illustrates a flashing system for a chimney penetrating a sloping roof.

In Fig. A apron flashing is installed after the course of shingles immediately below the chimney is in place. The sides of chimney are flashed using pieces of base flashing installed with each course of shingles. The upper edge of each piece of flashing should extend 2 in. above each course of shingles. The lower edge should be ½ in above the butts of the shingles forming the next course. The base flashing must extend up the wall and onto the roof a minimum of 4 in.

The counter flashing is installed in a raggle left by the mason in steps as shown. Lead wedges or tension forming shapes are used to hold the flashing in place and raggle is filled with a sealant.

The length of each piece of counter flashing will vary with the slope of the roof but no step should be more than 3 bricks high. The width will vary but should always be wide enough to cover 4 in. of the base flashing.

Detail 1 shows a type of base flashing that must be attached to the roof before the shingles are installed. The roof portion of this runner flashing has been formed with a hook edge and is cleated on 12 in. centers. The base flashing is extended up the wall a minimum of 4 in. The counter flashing is installed in a flashing receiver (see Fig A, Plate 49).

Fig B shows a saddle flashing (cricket) in place on the back of a chimney. Saddle flashings help to divert rain and snow away from the chimney. The cricket for Fig B is shown made in two pieces but may be formed in one piece (Detail 2). All joints in saddle flashings must be soldered.

Saddle flashing must be flanged 4 in. up the wall of chimney and 4 in. onto roof. It is cleated to the roof deck on 12 in. centers using cleats of the same material as the saddle. Step counter flashing is installed in a raggle as shown or may be installed in a flashing receiver.

# GLOSSARY

**architrave** In the classical orders, the lowest member of the **entablature**; the beam that spans from column to column, resting directly upon their capitals. The ornamental moldings around the faces of the **jamb**s and **lintel** of a doorway or other opening.

**ashlar** Masonry having a face of square or rectangular stones.

**back-primed** In good quality work, the back (unexposed) side of finish wood is painted with primer before installation. This seals and stabilizes the wood.

**base flashing** **Flashing** installed horizontally and turned up a wall or other intersecting surface. If the top edge is exposed it must be protected with a **counter flashing**.

**break metal** Light gauge metal used for flashing, trim, etc; formed in a tool called a "break" (or “brake”).

**c., ca.**, **circa** About: used to indicate an approximate date.

**casing** Door or window trim; also the finished millwork encasing a structural member

**cornice** In classical architecture the upper, projecting section of an **entablature**; also the projecting ornamental molding along the top of a building or wall.

**counterflashing** Upper, overlapping layer of **flashing** which covers the top of the **base flashing**.

**course** Horizontal row of stones, bricks, clapboards or shingles.

**double-hung window** A window having two (usually counterbalanced) **sash** which slide vertically past one another. (Occasionally one finds tall triple-hung windows with three operable sash, or **single-hung** windows with one operable sash)

**downspout** Vertical portion of a stormwater drainage pipe. Also called leader or conductor.

**drip edge** Edge from which water drips. On a roof the gutters are located at the drip edge (as opposed to the **rake** edge).
**eave** That part of a roof which projects beyond the wall. Most often refers to the **drip edge**.

**egress** Path to an exit. Includes passageways and doors

**elevation** Height above a datum. A drawing of one side of a building with all elements projected to a single plane; often used improperly to indicate one **facade** or side of a building.

**entablature** In classical architecture, the elaborated beam carried by the columns, horizontally divided into **cornice** (top), **frieze** (middle), and **architrave** (bottom).

**facade** Exterior face of a building. Current use applies this word to any exterior face, formerly it was applied to the principal exterior face which usually included the main entry.



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**fascia** Any flat horizontal member or molding with little projection.

**fenestration** Arrangement of windows in a **facade**.

**ferrule** Metal sleeve inserted into the top of a gutter so that spikes can be driven through the gutter (and the ferrule) without collapsing the gutter.

**flashing** Protective material, usually sheet metal, used to cover the joint between two parts of a building to prevent water from entering. Also a general term for similar material used for other purposes such as ledge covers and water diversions within walls.

**French drain** A shallow trench or hole filled with coarse gravel or crushed stone used to dispose of water. Water in the drain percolates into the surrounding soil.

**gable** Triangular top portion of the end wall of a building having a double-sloping roof.

**galvanized** Iron or steel coated by immersion in molten zinc. The word is sometimes improperly used for electroplating.

**grade** Top surface of the ground around a building: to bring to a desired height or contour the elevation of the ground about a building or the surface of a road or path.

**head** In general, the top or upper member of any structure. The top or end (esp. the more prominent end) of a piece or member. The upper horizontal cross member, between the jambs, which forms the top of a door or window frame.

**ingress** The way in. (See also **egress**.)

**in situ** In position; in its original place.

**jack arch** Flat arch. Used above square-headed openings, also called a straight arch.

**jamb** Vertical member at the side of a door or window. See also **head** and **sill**.

**joist** One of a series of closely spaced, parallel beams that supports a floor or ceiling; typically 2" thick in wood frame construction by the late 19th century.

**Kingpost truss** A triangular **truss** with a single vertical member in the center (a "kingpost") that connects the apex of the triangle with the middle of a horizontal tie.

**lintel** Beam spanning an opening and supporting a wall above.

**mortar** Material used to fill the joints of masonry. A mixture of sand, water, lime, and cement, sometimes including moisture repellent substances and other additives. The main function of mortar is to evenly transfer the loads downward through the masonry units. Cement was not a common mortar component in the U.S. until after **ca.** 1875

**muntin** Secondary framing member holding panes within a window, window wall, or glazed door.

**nosing** Protruding edge, often referring to stair treads and porch decks.

**parging** Thin plaster or mortar coat applied over concrete or masonry. Also called pargeting.



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**pediment** Triangular **gable** end of the roof above the horizontal cornice.

**pent** Small, sloping roof, the upper end of which butts against a wall, often above first floor stoops, doors, or windows.

**pilaster** Engaged (that is, attached to the wall behind it) pier or pillar, often with capital and base.

**pitch** Degree of slope. Used to refer to roofs and **grades**.

**plinth** A square or rectangular base for column, **pilaster**, or door frame. An architectural support or base (as for a column or statue.)

**point** To tuck mortar into a joint or crack. Sometimes improperly interchanged with **tuckpoint** and **repoint**.

**preservation** The act or process of applying measures to sustain the existing form, integrity, and material of a building or structure, and the existing form and vegetative cover of a site. It includes initial stabilization work as well as ongoing maintenance of the historic building materials.

**prime window** The principal window in an opening; used to differentiate between the primary window and a storm window or other protective panel.

**purlin** Piece of timber laid parallel to the ridge on the principal rafters of a roof to support the common rafters which run perpendicular to the ridge and on which the roof covering is laid.

**PVC** Polyvinyl chloride, a plastic used for pipe, baseboards, flooring, etc. A synthetic fabric used for roofing on low-pitch roofs.

**rake** Sloped edge of a roof, for example, the edge at a **gable** (as opposed to the **drip edge**.)

**rake edge** Sloped edge of a roof, for example, the edge at a **gable** (as opposed to the **drip edge**.)

**reglet** Continuous slot that receives the end of **counter flashing**

**rehabilitation** The act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

**reinforced concrete** Composite structural material in which concrete resists compressive forces and embedded iron or steel resists tensile forces.

**repointing** Refilling of mortar joints where the original mortar has weathered away. Not to be confused with **pointing** and **tuck pointing**.

**restoration** The act or process of accurately recovering the form and details of a property and its setting as it appeared at a particular period of time by removal of later work and/or reconstruction of missing earlier work.

**retaining wall** Wall built to retain a bank of earth at a change in **grade** levels.



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**roofing cement** Roofing tar, plastic cement, flashing cement, asphaltic patching compounds, and black goop are all names for materials which are frequently over-used in roof repair work. The use of these products gives a false feeling of confidence in the water tightness of the roofing. In addition to being short-lived, these products can be corrosive to most metals and make locating leaks difficult because they conceal flaws in the underlying materials.

**sash** Frame to hold the glass of a window; may be movable or fixed; may slide in a vertical plane (as in a **double-hung window**) or may be pivoted (as in a **casement window**). "Sash" is both singular and plural.

**SHPO** The SHPO (ship-o) is the State Office of Historic Preservation, a Federally mandated state agency. In New York the SHPO is the Department of Parks, Recreation, and Historic Preservation.

**sill** Horizontal bottom member of a window frame or other frame. The portion of a structural frame which rests on a foundation.

**Single-hung window** A window having one (usually counterbalanced) **sash** which slides vertically. (Most hung windows are **double-hung** with upper and lower sash sliding past each other, occasionally one finds tall triple-hung windows with three operable sash.)

**sister** Structural reinforcement by doubling members. The added piece is called a sister.

**soffit** Exposed undersurface of any overhead component of a building, such as an arch, balcony, beam, **cornice**, **lintel**, or **vault**. Frequently used today for the underside of the **eave**.

**solder** Traditionally, an alloy of lead and tin. Used to join metals in roofing and plumbing. Modern plumbing requires lead-free solder.

**step flashing** **Flashing** installed in small pieces, beginning at the lowest point, with subsequent pieces lapped (stepped) over the piece below. This is the typical flashing used at the intersection of a slopped roof with a penetration, such as a wall, which runs perpendicular to the ridge. It often requires a **counter flashing**.

**stop** Molding against which a door closes or which holds a window sash in place.

**swale** A depression in the earth. In construction, a shallow ditch with gentle **pitch** used to direct the flow of water.

**truss** Load-bearing structure composed of a combination of members, usually in some triangular arrangement, constituting a rigid framework.

**tuck pointing** Decorative pointing of masonry. The term is often misused to mean **pointing** or **repointing**.

**variance** Legal permission from the designated authority to violate one or more requirements of an ordinance. Often refers to permitted deviations from the local zoning ordinance.

**wash** A sloped surface, sometimes created by application of a thin layer of mortar shaped to shed water.

**watertable** Band (a belt course) at the junction between the foundation and the wall



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above. This band often protrudes to shed water.

**weather face** An upper surface exposed to the weather, usually slightly inclined to shed water.

**wythe** Vertical stack of masonry units one unit thick. A two-wythe wall has an exterior wythe and an interior wythe. Headers tie the wythes together; the remainder of the units are stretchers.



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