



Shields-Ethridge Heritage Farm

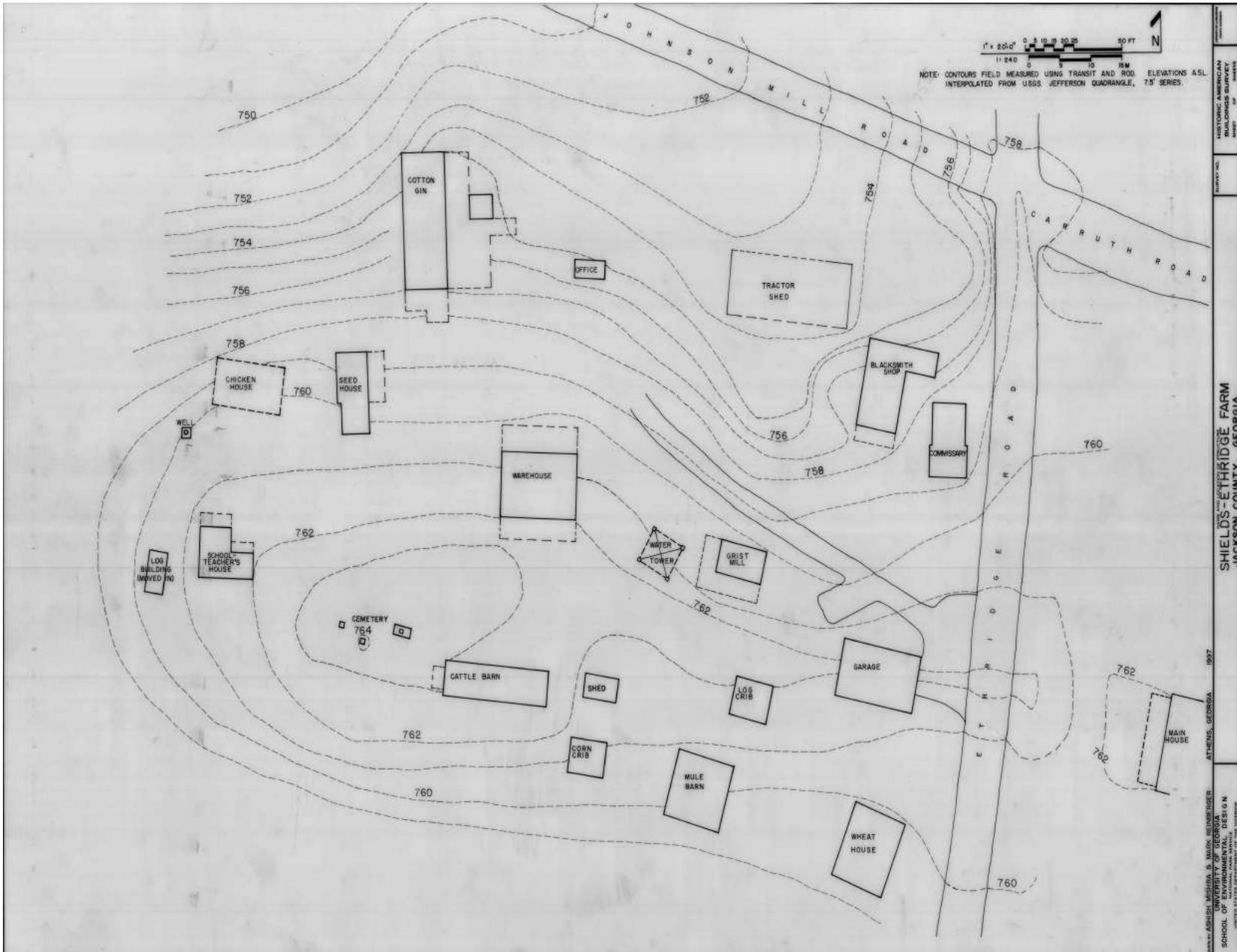
Historic Structures Report
Building Materials Conservation Class 2009
Master of Historic Preservation Students
The University of Georgia

acknowledgements

Above all we would like to thank Susan Chaisson, the director of the Shields-Ethridge Heritage Farm, who graciously put up with us poking around for a long time until this report was finished and who gave willingly of her time opening buildings and answering questions. Thanks also to Ian Firth who gave us much information on the early landscape of the farm and advice on treatment of trees.

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Map 1: Shields-Ethridge Heritage Farm Site Map

Introduction

by Mark Reinberger, Professor

A historic structures report is a comprehensive examination of the way a historic building is constructed, any problems exhibited by the construction materials, and proposed solutions to those problems. This study was undertaken at the request of the board of the Shields-Ethridge Heritage Farm by the Building Materials Conservation class in the Masters of Historic Preservation program at the University of Georgia. Students in the class wrote the sections of the report which was supervised by Tim Walsh and Mark Reinberger, faculty members in Historic Preservation. Hopefully the report can serve as a blueprint for conservation work on the Farm over the next twenty years, guiding ongoing repair and restoration work, and giving background for potential grants to aid the work. It deals with most of the farm's buildings, especially the structures in the primary farm area across from the Main House (Map 1). For each building the report describes its construction methods, notes ways it has been changed over time, diagnoses conservation issues where they occur, and prescribes remedies for these issues. Extensive drawings and photographs document the structures and illustrate the findings.

In her 2002 thesis *Presenting Mr. Ira's Masterpiece: Two Centuries of Agricultural Change at the Shields-Ethridge Farm*, University of Georgia graduate student Frances Patricia Stallings discussed Ira Washington Ethridge's interest in the modern, the mechanical, and perfection. His diversity of interests was reflected in the buildings and businesses at Ira Ethridge's farm during the early twentieth century following his 1895 arrival in Jackson County from the Gwinnett County town of Auburn.

From his days as a teacher in Jefferson until his death in 1945, Ethridge embarked on

a journey through a variety of business ventures designed to diversify the financial support of the farm he and his wife, the former Ella Shields, had inherited from her father Robert Shields. His “propensity for perfection and skill in accounting and penmanship” (Stallings, 2002) paralleled and helped propel his search for financial stability. After assuming management responsibilities for the farm following his marriage to Ella in December 1898, Ethridge proceeded to look toward the rapid introduction of farm machinery designed to move the farmstead from grower to processor. Stallings’ thesis chronicles in great detail Ethridge’s almost half-century quest to operate the most modern agricultural concern in the area.

Three structures in the primary Farm area are not included in the study. The Water Tower, a historic structure, was not assessed as part of this study because it was not deemed appropriate to have students climb it. Our observations from the ground suggest that the Water Tower is in generally good condition, though the wood deck just below the tank may need some work. An engineer should be engaged to examine the Tower more fully and make recommendations for its conservation. The Gin Office, a small historic structure, was not included because it has been fully restored within the last five years and so needed no comment at this time. Like all buildings, it will need monitoring as future problems develop. Finally, the Tractor Shed was not included in the report as it is a newer structure, not yet of historic stature, and seemed to have few problems. At some point in the future it will undoubtedly need assessment.

Most of the buildings on the Shields-Ethridge Heritage Farm are approximately a century old. During that time, they have been altered and maintained to varying degrees depending on their intended use and importance. The Farm has not been in full operation for about 35 years and it has been set aside as an historic site for about the last 20 years. Both use and disuse result in deterioration of buildings, though in different ways. Also, in some cases the Farm’s buildings were not considered by their owner to be heirloom structures that were meant to last forever. Moreover, alterations in the site over time (such as changing of the grade from normal soil build-up and erosion, tree growth and falls, and rerouting of roads) have affected buildings. For all these reasons, many buildings on the site are in need of significant conservation work if they are to last for another generation.

Site-wide Conservation Problems

Most of the analysis and recommendations are specific to individual structures

and appear in the sections below. However, certain issues appear in many or all of the buildings and need to be addressed across the entire site. For example, if it has not already been done, the perimeters of all buildings should be treated for termites. Termite damage appears in many structures, although usually not actively, and termites are one of the biggest threats to the Farm's buildings. At the end of this introduction is an appendix with information about a proprietary spray product, Boracare, which may help the Farm with termite and other insect problems.

Artifacts constitute another issue that must be addressed site-wide. Almost every structure on the Farm is jammed full of valuable relics of farm life and work, building materials, and other supplies. Often these form a vital part of the site's value and charm, but in only a few cases are they displayed in a way that is meaningful to the public and salutary for the artifacts. In many buildings they constitute a genuine hazard to the structure, either through unwonted loads, reservoirs for undesirable agents of deterioration (such as termites), or impediments to examination and conservation work. Artifacts should by no means be discarded, but they must be removed from most structures, inventoried, and then stored or displayed in appropriate ways. Indeed this needs to be done before conservation work can proceed on most buildings. Probably the best method to accomplish the task is through the erection of a new, secure building in a part of the Farm away from public view. Here artifacts can be sorted, inventoried, cleaned and repaired, and stored until they are reinstalled on site as part of a well-planned program of interpretation.

What to do with roofs on the site is a general issue of major importance. The roof of



each building will have individual considerations, but because so many need repair or replacement, and because they are such important character-defining features, it is worth developing an overall policy for the entire Farm. Most buildings were constructed in the early twentieth century and apparently have had metal roofs for their entire lives. Most buildings now have 5-V crimped or corrugated metal roofs that have great age and may be original or nearly so. Exact metal types (galvanized steel, terne metal, or tin) are difficult to tell and unimportant for conservation. All should be painted and most are so painted, red, a common roof color. However, several buildings (Wheat House, Feed House, and Teacher's House) contain evidence that they were originally covered with wood shingles; and one (Mule Barn) that it was at least partially covered with asphalt shingles. Moreover, the two log cribs, moved to the site from older farms, would have had wood shingle roofs. It must be admitted that more of the Farm's buildings might have been covered with wood (or less likely asphalt) shingles for at least part of their lives.

If it is the intent of interpretation to present the Farm as it was, fully developed, about the 1940s, then red painted, 5-V or corrugated, galvanized steel or terne metal roofs would be most appropriate. A mixture of 5-V and corrugated would preserve the varied and ad hoc state of the Farm today. Exceptions to this rule would be the two cribs which, not being present anyway, should be restored to their original appearance with wood shingles and so interpreted. Alternatively, a few buildings from the turn of the twentieth century (those where there is firm evidence) could be restored with wood shingles. It is entirely possible that as late as the 1940s, some buildings may have preserved their original wood shingles, only subsequently being re-roofed with metal.

Another conservation problem common to many of the farm buildings is site drainage, a combination of what happens to water that runs off the roofs and that which flows from rainfall uphill from structures. Parts of the site (such as around the gin) have sufficient slope to carry water away, but other sections (such as the barn complex) do not. In other cases (such as the Warehouse) grade has risen through fall of leaves and other debris, so that the walls of the uphill side of a structure are buried in earth and so subject to rot and insect damage. In the report below, we recommend that swales be established around a few buildings (Grist Mill and School Teacher's House) and that perimeter drainage systems be installed around others (Commissary, Blacksmith's Shop, Garage, Warehouse, and Wheat House) to correct these problems. A landscape architect can give advice on the exact position of the swales. A detail of a perimeter drain is given

in the section of the report dealing with the Commissary. Map 2 shows these recommended features.

Problems with water and roofs are mightily impacted at the Shields-Ethridge Farm

by the many trees that stand around the complex. Some of these are ancient, magnificent specimens that are older than the farm and have borne witness to its history. These might well be considered as much or more valuable than the farm buildings themselves. Other trees have grown up at various periods in the farm's history and may or may not be valuable for shade or the interpretation of history. Some trees form direct threats to structures, and one structure (Two Stall Barn) has actually been damaged by a tree to the extent that it must be dismantled and re-erected. Several structures have been severely damaged by the recent fall of trees, and it is to be hoped that more of these events can be prevented.

An arborist should be engaged to examine all trees on the site and evaluate their condition. The arborist should then meld this information with the following recommendations regarding trees that we see as threats to structures, and produce a comprehensive plan for tree management. Map 3 presents our findings with regard to trees and their impacts (present and potential) to historic structures. The map makes guesses about the condition of trees and recommendations for retaining or removing trees. Removal has been recommended only where a tree seems to us an imminent danger to a historic structure. The map was developed with the help of Ian Firth, Landscape Architect, who has produced a Historic Landscape Report for the Shields-Ethridge Farm as well as a plan for interpretive signage. Again, its conclusions should be confirmed by a skilled arborist.

Finally, exterior painting is a site-wide concern. Many, perhaps most, of the structures of the farm complex carry traces of whitewash on their clapboards or concrete blocks, recalling that Ira Washington Ethridge called his establishment "White City Farm," perhaps an allusion to the Chicago Columbian Exposition of 1893 which he visited. In addition, some buildings (Commissary, Garage, Grist Mill, Wheat House, and Teacher's House) carry traces of paint on trim, mostly red but some blue. We recommend that a paint analyst be employed to verify paint materials and colors, and that, based on findings, some or all of the buildings that were painted be so again. Not only will paint make the Farm's appearance more authentic but it will help preserve building materials.

Priorities

The buildings on the farm are presented below in a roughly geographical order,



beginning at the northeast corner of the site with the Commissary. However, since it is unlikely that all the work called for in the report will be completed at any single time, more important for the Farm is a list of priorities of what structures should be addressed first, second, etc. The following list has been developed in conjunction with a representative of the Farm's board and considers the relative importance of a structure to the Farm's history and interpretation, along with the degree of severity and threat posed by the structure's conservation problems.

Priority I structures are:

Commissary
Blacksmith's Shop
Cotton Gin
Grist Mill
Teacher's House

Priority II structures are:

Seed House
Garage
Wheat House
Mule Barn
Warehouse

Priority III structures are:

Concrete Crib
East Log Crib/Hog Pen
West Log Crib

Priority IV structures are:

Feed House

Two Stall Barn

Milking Barn

Appendix

1. BORA CARE Termite Insecticide, Termiticide and Fungicide is a highly effective odorless pesticide which offers an innovative approach for the control and elimination of termites.
2. BORA CARE is an EPA Registered, low toxicity pesticide designed to penetrate and protect all types of wood, including plywood and composites, from infestations of wood boring insects such as termites, Powderpost beetles, carpenter ants and decaying fungi. BORA CARE is designed to treat the termites' food source - wood and other cellulosic materials. BORACARE works by depositing an active ingredient in the wood which will not decompose or vaporize like many other pesticides. This means that it will keep providing broad spectrum protection with little impact on our environment.
3. In addition, BORA CARE provides long term protection (up to 40 years) against future infestations. Odorless concentrate used to prevent or eliminate active infestations of Drywood, Formosan and Subterranean termites.
4. BORA CARE prevents reinfestation, kills powderpost beetles and their larva, Anobid beetles, Old House Borers and stops Carpenter ant damage.
5. BORA CARE destroys existing decay fungi and provides protection against reinfestation.
6. BORA CARE is labeled for use on natural untreated wood. Excellent for preconstruction of decks, fence posts or any other wood surfaces that make contact with the soil. Provides protection for the life of the wood. Indoor and outdoor use. It's the best insurance you can buy for wood destroying insects and organisms.

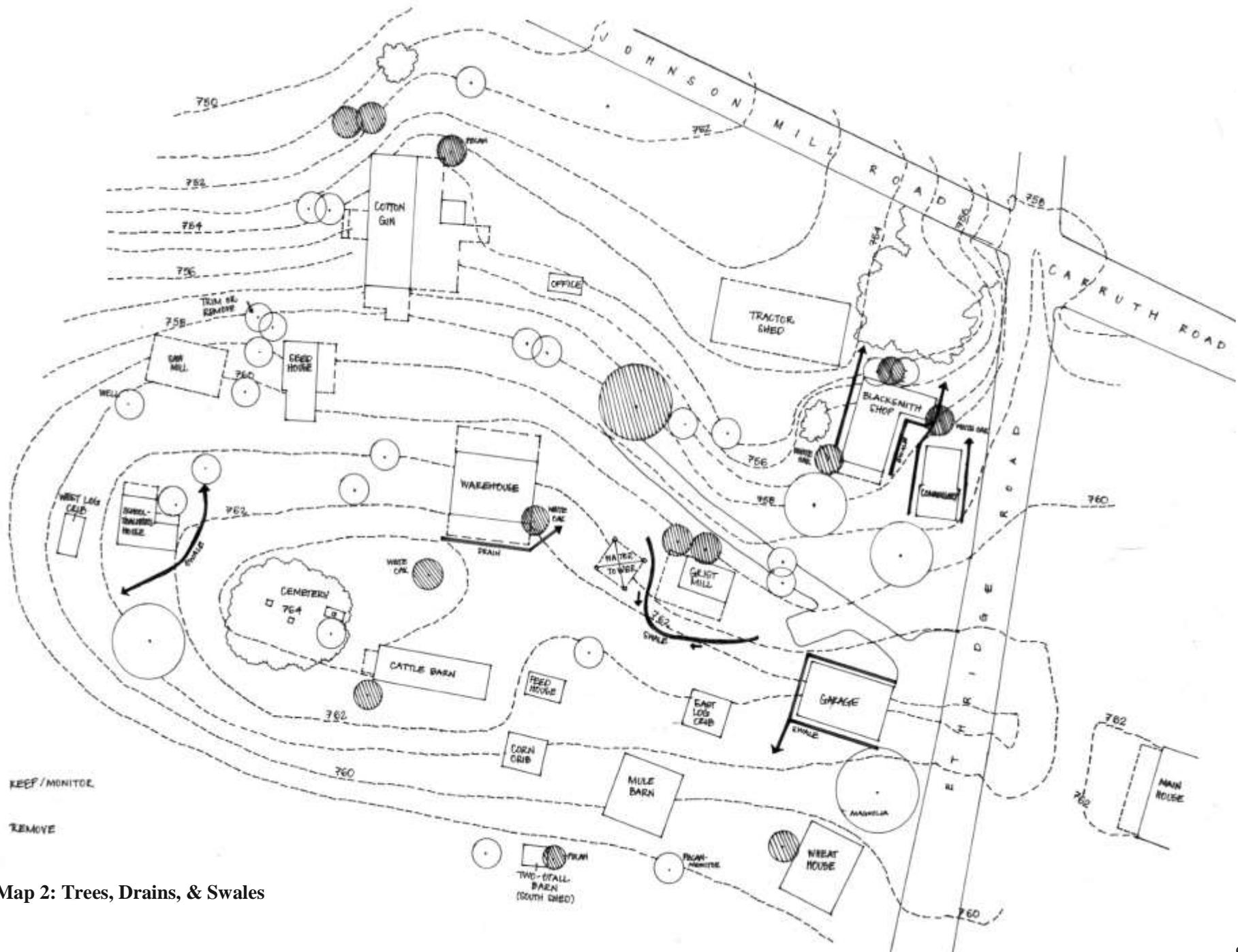
7. Bora Care is mixed 1:1 to 2:1 Boracare Dilution Tables See
8. One gallon of Boracare can be sq. ft.
9. Boracare may be used on natural decks, fence posts or any other Provides protection for the life of insurance you can buy for wood

depending on insect and thickness of wood. See Boracare Dilution Tables for more details. sprayed or brushed on and covers from 200-800

untreated wood. Excellent for pre-construction of wood surfaces that make contact with the soil. the wood. Indoor and outdoor use. It's the best destroying insects and organisms.

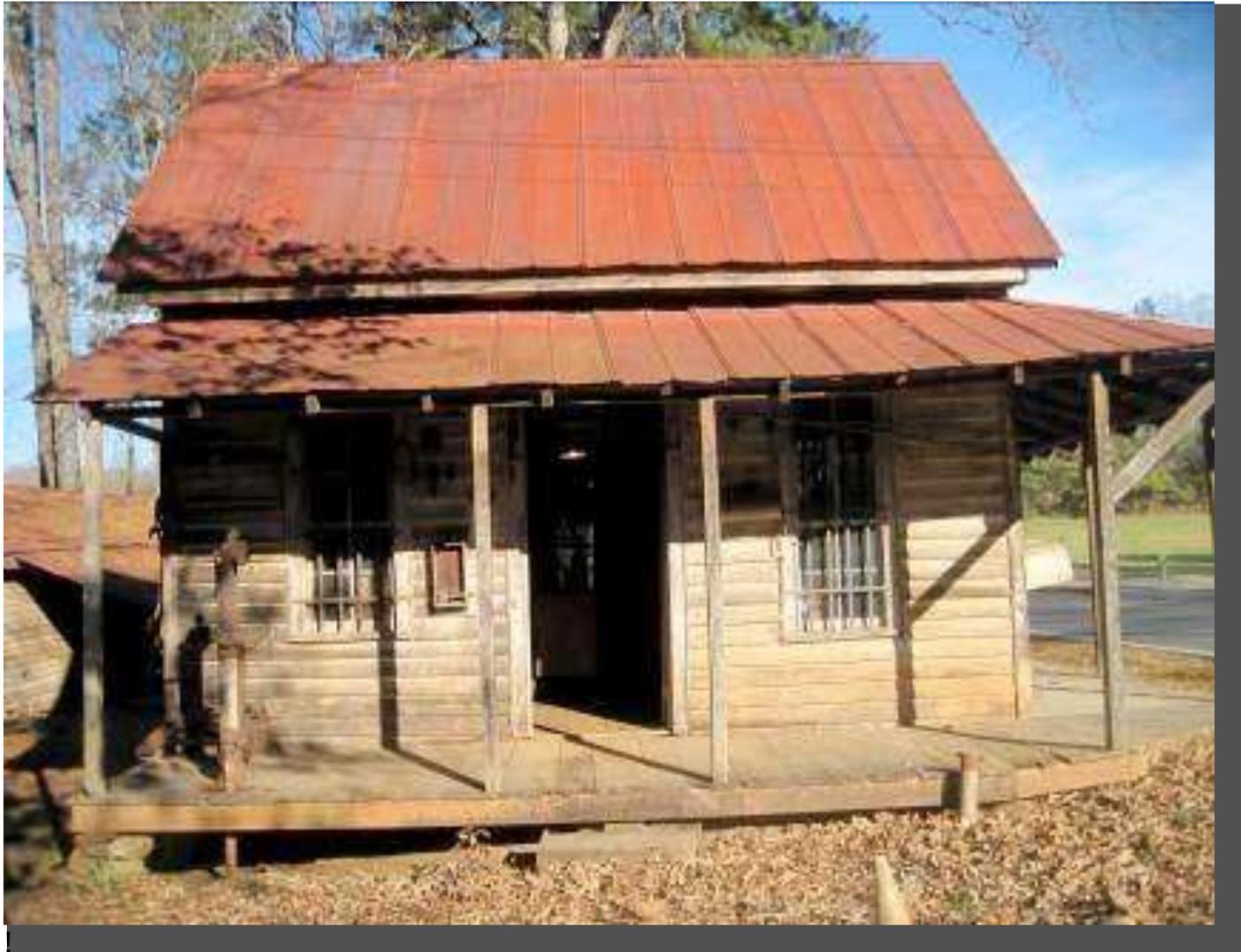
This information is available at:

<http://doyourownpestcontrol.com/spec/pick-boracare1.htm>



Map 2: Trees, Drains, & Swales

a. the commissary



Introduction

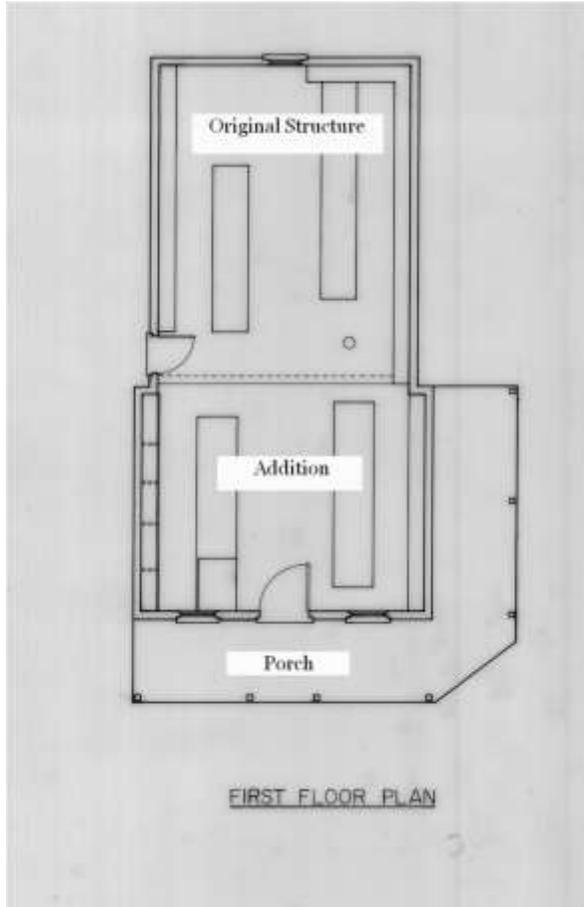


Figure A-1: First Floor Plan

The Shields Ethridge Heritage Farm's landscape, buildings, historic farm equipment and other artifacts are used as a teaching tool and open to the public. School field trips, festivals, tours, and educational seminars are just a few of activities hosted at the site. According to a Landscape Master Plan completed by Robinson Fisher Associates in 1998, the commissary was likely moved in the 1950s when Ethridge Road was realigned and Johnson Mill Road was moved to its present location. The commissary, built circa 1901, was previously at the northwest corner of those two roads. The main road was moved about 50 feet to the west and Johnson Mill Road more than twice that to the north. The Robinson Fisher report suggests that the commissary was moved approximately 30 feet to the west at that time. According to personal accounts and recollections of the owner, the commissary has always operated from this building. In its time, it was the main location for goods and provisions in this area. The commissary contains a wealth of artifacts and houses a wide variety of items, from vintage cans, medicine bottles, cloths, tools, and more. The commissary was permanently closed in the mid-1940s.

The commissary is a one-story, wood clapboard building, roughly 18'4" x 34'3" and is essentially a rectangle in plan on a stacked stone foundation. The building is constructed with platform framing, but still has corner braces throughout for stability. It has a wood plank floor, with a wood subfloor. All walls are load bearing and a 5-V metal roof covers the building.

The commissary was built in two phases, and an onsite evaluation revealed the front façade is a later addition. The rear section of the building has a complete perimeter of sills, indicating it originally had four walls. There is also evidence of clapboards along what is now an interior/middle sill. Wood wedges, approximately 1½" x 3" were nailed to the sill allowing the first clapboard to kick out. The front section of the building only has three sills, indicating it was an addition and never stood alone as a 4-sided structure. This addition is two feet wider than the original, by one foot on each side. Though the exact date of the addition is unknown, the technology and weathering is consistent throughout the building indicating the addition was likely added soon after the original construction.

The north side (back of building) has a gabled roof with one window in the center of the north exterior wall. The front addition is



Figure A-2: South elevation



Figure A-3: East elevation

three bays wide with a side gabled roof. The door is centered and flanked by two double-hung sash windows, the usual configuration for such country stores. A porch with a shed roof runs the length of the façade, wrapping around the east side where it ends at the joint to the original building.

Existing Conditions

Foundation

The commissary is raised on a pier foundation with no footings, with most piers made of dry laid stone. Along the west side, four have been replaced with poured, tubular concrete piers, indicating changes in the building's evolution. Some stacked brick is also present. Piles of stone near the poured concrete tubes are likely the stone from the original pier. Brick piers were used as interior foundation supports and are in good condition because they have been protected from the weather.

There is a substantial shift in the grading and elevation, roughly 18 inches, between the southern elevation (front of commissary) and the north (back of commissary). This grade change was likely impacted by both natural and manmade changes in the landscape over time. A continuous build up of leaf litter and debris, close proximity to the paved road, changes in land use patterns, and tree growth has shifted the ground over time. For example, the grade on the southern end has changed so significantly that the foundation piers are no longer visible. The porch is essentially resting on the ground, making it more vulnerable to both water and insect damage. Surrounding leaf litter and other debris hold in moisture causing fungal growth on the northern, exterior piers. Continuous shade from mature trees exacerbates the problem.

Over time, the east side of the original building has settled significantly. This settling impacts the overall stability of the building



Figure A-4: West elevation



Figure A-5: North elevation

because it leads to problems in the framing. The settling has caused the sill around the perimeter to rotate and slip off the frame on the west side of the building. As the east foundation settled, the structural support on the west side has been compromised and is currently a safety hazard. While an attempt was made to repair the problem, this section is not currently stable. The southern half of the crawl space was not accessible and foundation/subfloor problems could not be obtained, but it can be assumed that there are similar problems with the framing so close to the ground.

Existing Conditions

Sub Floor

The floor joists span are 2x8 circularly sawn wood planks placed 24" inches on center with a 15' span. According to the joist table with $E = 1,400,000$ and a live load of 40 psi, the maximum span should be 10'10". Given the size, spacing, and span of the joists, the current sub floor and foundation is not sufficient. The sill is 6x8. The subfloor on the original/rear section of the building, is circularly sawn 1x6s running perpendicular to the joists. At mid span along the joists are 1x4 X-bridging, which adds structural reinforcement to the floor.

Exterior Walls

The exterior walls of the commissary are pine clapboard siding with evidence of circular saw marks. These marks are consistent with the approximate dating by the property owner. Interior studs are approximately 24" on center. The bottom clapboard on each side of the building shows evidence of mold, fungus, and/or rot. Carpenter bees, rodents, and powder post beetle infestation is most evident on the north elevation. Fresh frass is visible and indicates an active termite colony.

Significant problems with the exterior walls are most visible at the addition. The front, side gabled addition is two feet wider than the original building, one foot wider on each side. This caused a one-foot extension on each side. The west side extension is "patched" closed with pieces of scrap wood. The pieces of wood have compressed and contracted over time, forcing nails loose and creating large gaps that expose the interior to the elements.

The east side extension does not have this patchwork, and does not have the large gaps. The east side does show visible sagging



Figure A-6: Foundation problem



Figure A-7: Poured tubular concrete cribs

and bowing and some clapboards need replacing.

The west exterior wall includes several irregular replacement boards. Pneumatic-driven nails on the replacement boards are indicative of more recent patchwork. A distinct wood “ledger” runs horizontally along the top exterior of the west side, above the top clapboard and below the fascia. In addition, an old door on this side has been boarded up and no longer functions. This material evidence combined with personal accounts from the property owner points toward the possibility of a porch on the west side of the original building. A variety of blacksmith products, farm equipment, and other artifacts are hanging on the southern half of the west exterior wall, but do not affect the stability of the siding. There is evidence of red paint on the original west side. The clapboard siding on the south end has been protected from the elements by the porch roof and is in good condition. There are remnants of original whitewash.

Windows

The commissary has three windows, two windows on the south facade, (flanking the entry) and one centered on the back of the building (north side). All windows are single-hung sash, four-over-four panes, and have intact original glass and wood casings. The two windows on the front facade are in good condition because they have been protected by the porch roof. The back window (north side) has been exposed to the elements causing severe rot and damage to the sills, casing, muntins, and surrounding clapboards. All muntins measure at ¼” and the surrounding frames are 1 1/4” thick. Metal (iron) cross bars on all windows are likely original to secure the commissary from burglars or vandalism. The metal/iron bars have rusted over time.

Roof

The commissary is covered by a red painted, galvanized steel, 5-V roof. The spaced lath are locally milled and different widths (1x6s and 1x8s). Rafters are installed at 24” on center, spaced lath is 12” on center, but there is not a center ridgepole. The rafters

the entire width of the room. Limited inspection on the northeast side showed evidence of an



Figure A-8: Sill (west side), slipped off foundation



Figure A-9: X-Bridging sub-floor

earlier wood shingled roof. The roof utilizes false plate construction, and contraction over time has caused nails to loosen and pop out, which has resulted in pinhole leaks. The construction does not allow access for a comprehensive roof inspection.

A shed roof covers the front and side porch. The roof is the same red painted, 5-V, galvanized steel. Porch rafters are 2x4s and installed approximately 24” on center, with a 4x6 span. The porch has spaced lath that are 1x3s that are installed approximately 15” on center. The porch roof is supported by six posts that measure 6’7”.

Interior

The interior of the building reflects the two separate building phases, and is broken into two distinct sections. The first room (which is the main entry at the south façade) has a beaded board ceiling and counters that run parallel along the east and west walls, each with a glass display case. The clapboard walls also have multiple display shelves running along both sides of the building. In the rear room (which is the original building), the ceiling is corrugated metal. Again, there are counters that run parallel along the east and west walls. The walls also have rows of shelves. The west interior wall is insulated with the same corrugated metal. The east interior wall is clapboard. A smoke pipe in the rear section indicates a stove that could have been used for heating. The pipe has been enclosed and is not a threat to the interior. There are signs of animal infestation throughout the building (squirrels, mice, etc.) and evidence of an active powder post beetle colony on some of the wood artifacts housed inside.

The interior wooden floor has an obvious and visible buckle caused by deficiencies in the early foundation of the original/rear section

French Drain

French drains collect and transport water. Sometimes the discharge is into a drywell rather than above ground.

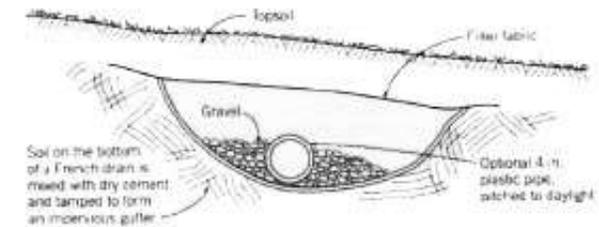


Figure A-10: French Drain example



Figure A-11: Clapboards need replacing

of the building. The floor also slopes significantly from the addition to the back of the building. A measurement from floor to ceiling at the addition has a height of 8'6," while the same measurement in the back of the building has a height of 8'2," indicating a slope of approximately 4". The floor also has intense staining throughout. Staining may be caused from a long history of waxing and/or the intense build up of dirt and oil over time. Staining could also be caused by insufficient storage of liquids. Oils, grease, and other liquids are leaking from storage containers. Spills and leaks from these containers are a potential fire hazard and could cause major damage to the original floors. Massive amounts of materials housed in the commissary are excellent artifacts. However, materials may be adding unnecessary weight to the floor and could create problems. Knot holes in the floor planks are rotten and creating holes in the floor.

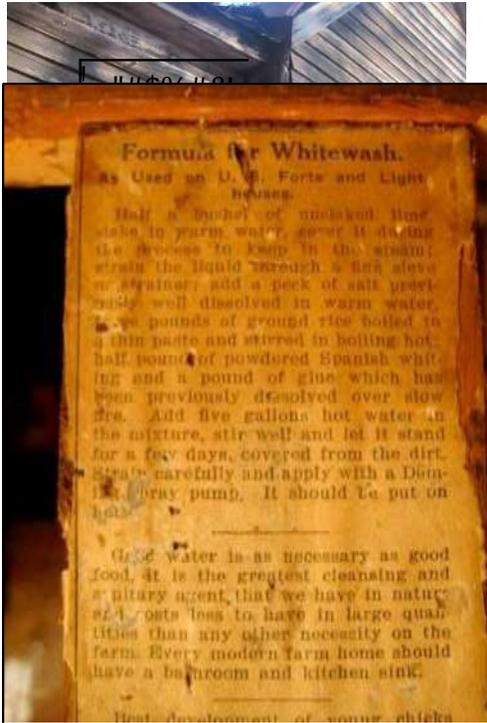
Recommendations

The following is a list of recommendations for the commissary. Any new work should be dated to guide future research and treatment. In addition, a comprehensive annual maintenance plan should be developed and implemented to prevent further damage to the building.

Foundation/ Sub Floor

The foundation and sub floor are the most critical issues for the commissary. Lack of an appropriate site water drainage system continues to affect the foundation. Currently, the northwest side of the commissary is a hazard and safety threat to visitors.

- The sill on the west side of the building is not currently bearing on any support system. The sill and joists needs to be stabilized on blocks until the east side foundation can be addressed. This is an immediate threat to the structure.
- In order to determine if the sills along the east side have enough integrity to be repaired, dead weight should be removed and the interior floor in the northeast corner should be removed (numbered and photographed) so access can be gained and a thorough investigation can be conducted.
- A proper girder should be constructed and installed. This will cut the span in half and provide appropriate structural support.
- The grading and slope of the land around the commissary needs immediate attention because the water and moisture is causing problems to the foundation, wood clapboards, etc. A series of foundation drains need to be installed around the entire building, which would move water away from the site.



elevation

Figure A-13: Recipe for Whitewash posted inside Commissary

Exterior Walls

- Clean all exterior walls with a natural-bristle brush and a water-bleach solution to eliminate and protect against mold and fungus growth.
- Window on north end is in poor condition. The sill, casing, and trim should be replaced in kind.
- Two windows on front façade are in good condition, but should be cleared of leaf litter and other debris.

Figure A-14: Shelving artifacts in interior

- Some clapboards need replacing as indicated in Figure A-11.

Roof

The roof does not need to be replaced at this time. However, it will eventually need to be replaced and certain measures can be taken to prolong its life span.

- Roof needs to be cleared of all debris and repainted.
- Loose nails should be re-fastened, where possible. A more permanent solution would be to replace all loose nails with screws.

Interior

- Interior needs to be treated for termites, powder post beetles, and other destructive pests. All items need to be treated/sprayed.
- A comprehensive inventory of all items should be completed. Once completed, only items that are relevant to site interpretation and to the determined period of interpretation should be reintroduced.
- All flammable liquids stored inside the commissary are a fire hazard. All containers should be emptied and, where appropriate, showcased for their historic value.

Figure A-15: Floorboards buckling

Figure A-16: Ceiling goes from beaded board in the store “front” (south end) to corrugated metal in the rear (north end).



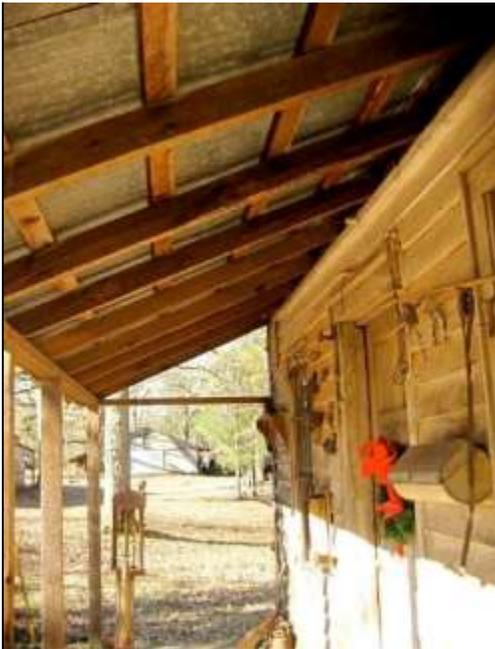


Figure A-17: View of front/south facade under porch

**Figure A-18: Dry stacked stone foundation
handwritten notes**

Figure A-19: Back wall of commissary has piers

b. the blacksmith's shop



Figures B-1,2, & 3: Blacksmith Shop interior pictures:



Introduction

One of the key buildings on the Shields-Ethridge site is an old blacksmith shop, built just west of the commissary at about the same time, that is, very early in the twentieth century. The blacksmith shop is particularly unique because it bridges the gap between building conservation and artifact conservation. The shop is home to dozens of interesting artifacts, including an oxen yoke, wagon wheels, barrel hoops, and an assortment of plows and other farm equipment. The shop also has a working forge and is still used to demonstrate blacksmithing. It is important that this structure maintain its integrity, not just for the sake of its inherent historic significance, but also for the importance of the artifacts it holds. There are four additions to this building; a carpentry shop on the northeast corner added in 1925 ; a small storage shed extending off the east side (referred to as the porch in this report); a small privy in the west side; and a front gabled porch on the southern, front facade. Though no exact date is known for most of these additions, paint evidence and consistent weathering suggests that these additions were made soon after construction. The blacksmith shop is clapboard, L-shape, with a front gabled, corrugated metal roof (except for the east side porch which has a 5-V metal roof). Remnants of original paint colors are visible in protected areas and include blues, greens, and whitewash.

Existing Conditions: Foundations

Front Porch

The front porch is supported by one post on each end. Originally, these posts rested on a stone foundation, but currently the posts are bearing directly on the ground due to decades of dirt and debris buildup. This has allowed easy access for pests and water damage, and the lower sections of the posts have been compromised. While still in fair condition, evidence of carpenter bees and other pests are visible on the posts.

Blacksmith Shop

The blacksmith shop transitions from pier foundation and dirt floor in the front to a continuous concrete foundation at the north end



Figures B-4, 5, & 6: The images above are of the Blacksmith Shop interior

perimeter. The concrete has a crude lime and clay based cement, with field stone aggregate ranging from 1” to 6” in diameter. The foundation does not bear on any footing, which is currently not a problem. The continuous foundation would have provided fire protection from the forge and an enclosed workspace for the blacksmith. Mechanical damage from a nearby tree caused severe cracks and spalling to the northwest corner of the foundation. While this tree was removed, the repairs are now failing. Cement was injected to repair the cracks, but that work has loosened and is no longer functioning. Metal pipes were installed near the foundation to provide support and stop the movement of the foundation. However, a second tree on the north side has grown and threatens to cause additional damage to the area.

In addition, pier foundations along the west side have settled over time because of insufficient footing. Currently, the piers are leaning away from the building causing the west exterior wall to bow.

East Side Porch

A small shed roof extends off the east side providing a covered storage area. Three unevenly spaced square posts support this. Due to severe grading issues and debris build up these posts are sitting directly on the ground and show signs of rot. This also makes the posts more susceptible to insects.

Carpentry Shop

The sills in the addition are 5x8, with 2x8 joists at roughly 16” on center. The sills are half lapped at the corners. Three sills have been replaced on the north, east and west sides with pressure treated 2x8 yellow pine planks nailed together. Joists span is 10’11-1/2”, which is an allowable length for a live load of 40 psf.

The shop bears on concrete blocks measuring roughly 6”x8”x2”. The major issue with the foundation is extreme debris build up. The leaf debris and grading is so poor that the southeast corner is bearing directly on the ground.

Privy

There is no foundation remaining on the privy. The east side bears directly on the poured concrete foundation of the blacksmith shop. The two posts supporting the shed roof on the privy are completely deteriorated by termites and water damage and are not even touching the ground.

Existing Conditions: Exterior Walls

The whole building is clapboard with an average exposure of 4 inches and a thickness of about 1/2”. All exterior walls show evidence of termite damage, powder post beetles, and moisture problems. All clapboards highlighted in red need to be replaced.



Figure B-7: Weatherboards on this facade need to be replaced.



Figure B-8: Replace this weatherboard



Figure B-9: Replace these weatherboards and post.

This post should also be replaced.



Figure B-10: All clappingboards on this facade should be replaced.



Figure B-11: All clapboards on this facade should be replaced.

Figure B-12



Replace these two clapboards.

Clapboards within this area should be replaced.

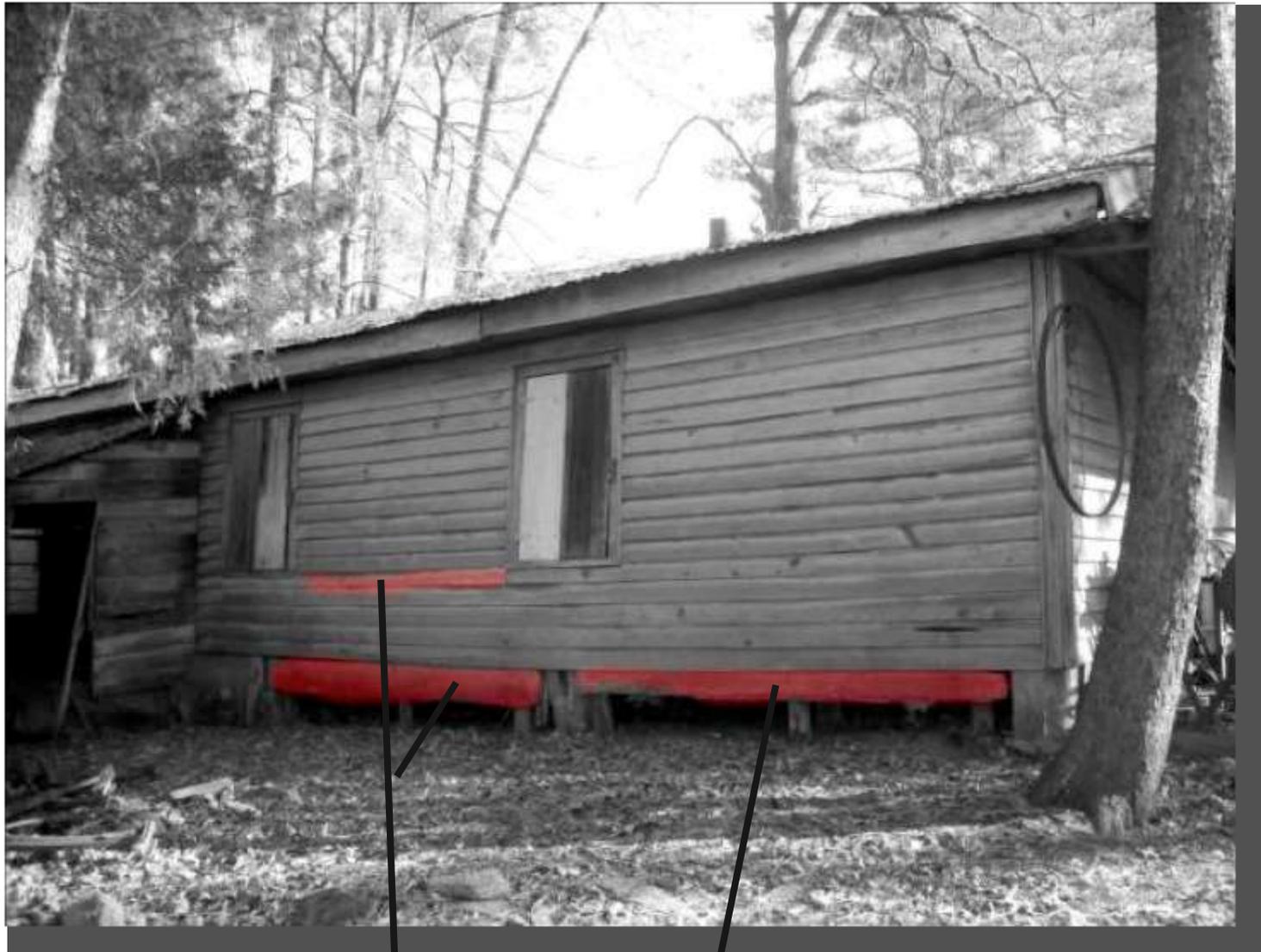


Figure B-13: Replace these clapboards.

Window Schedule

There are a total of twelve windows on all elevations (none on the front façade).

01	No sashes present, evidence of single hung window in case, circularly sawn wood shutter.	GOOD	02	Single hung window, 6 over 6, missing 5 panes, missing most of its shutter, no rot, window is joined by nails.	FAIR
03	Casement, sash good condition, shutter missing. Sash is fastened with pegs in the corner.	GOOD	04	Shuttered, 6 pane casement, mildew build-up on shutter, debris on sill is creating soil. Sill needs to be replaced, sash fastened with pegs..	POOR
05	replaced, sash is fastened with pegs. Nailed shut from the outside, shuttered 6 pane casement window, sash is fastened with pegs.	POOR	06	Some fungal growth on exterior of shutter.	FAIR
	07	FAIR	08	Single hung 6 over 6, missing panes, window frames and casing in good condition, fastened with nails.	FAIR
	09	FAIR	10	Single hung 6 over 6, missing panes, window frames and casing in good condition, fastened with nails. Shuttered, 6 pane casement, rotted sill needs to be replaced.	POOR
	11	POOR		Fixed, bottom frame on case is rotten, existing	

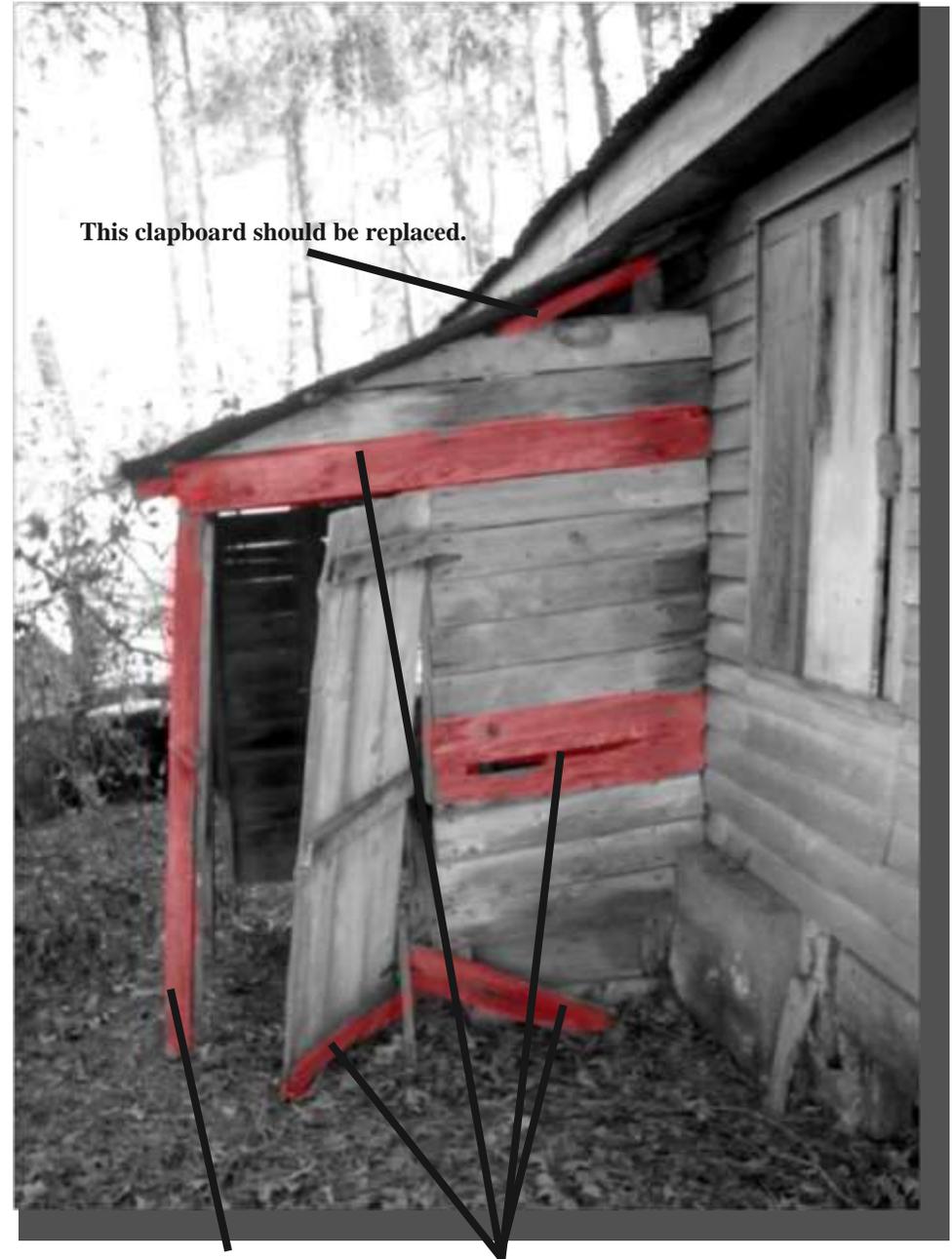


Figure B-14: All of these boards should be replaced.

panes are loose.

POOR

- | | | |
|----|--|------|
| 11 | Single hung 6 over 6, broken panes, debris on sill, fragile muntins, remnants of original paint of shutters. | POOR |
| 12 | No sashes present, evidence of single hung window in case, circularly sawn wood shutter. | POOR |

Roof Systems

Blacksmith Shop

The 2x8 rafters are spaced irregularly, with none more than 24" on center, with a span of 9'6". Approximately 4' from center ridge line, there is a brace. The blacksmith shop does not have a ridge pole. Spaced lath is inconsistent and appears to be made from leftover or found wood pieces. No regular spacing or size is apparent. There is some water damage from pinhole leaks in the metal roof which should be replaced on all pieces of the building. Charring from the forge is also evident.

Front Porch Addition

The porch on the front facade is a gabled sheltered area supported with a single round post on each end. Its roof is separate from the main building. The 2x4 rafters span 10'10". The roof is corrugated steel. The width of the spaced lath varies. It is roughly 5' long and is spaced anywhere from 1' to 2' on center. The overall condition of the porch is fair. Some pieces of lath show signs of water damage.

Privy

The privy has a shed roof of corrugated steel. It is supported by 2x4s rafters, with a 4' span. The rafters have severe water damage and the metal roof is rusting.

East Porch



Figure B-15: Window schedule plan

The east side porch is a 5-V crimped metal roof, painted red. The roof is supported by 2x4 rafters that are roughly 20” on center, with a 7’ span. The rafters and spaced lath have severe water damage. Repairs are evident through sistering of new 2x4s with the older rafters.

Carpenter Shop

The rafters are 2x4 and installed 24” on center. Ceiling joists are 2x8 and 24” on center. Rafters bear on a single top plate and are connected with a birds mouth joint and toenails. A chimney located in the carpenter shop is allowing water to enter through failed flashing. Mechanical damage to the exterior of the roof has created a large hole above the window at the northeast end. This has resulted in extreme water damage on the interior ceiling of the shop.

Interior

The Blacksmith Shop

The blacksmith shop has a historic stone forge at the northwest corner that is still in active use. A variety of repair work is evident in this area, including sistering of 4x4s behind the hearth and expanded metal lath to keep embers from falling back into the wall. There is no interior finishing on the walls, besides built in cabinets between the studs. It has a dirt floor, and no ceiling. The carpenter’s shop is the only addition accessible from the interior.

The Carpenters Shop

Two steps lead up to the entry of the carpentry shop. The interior has a finished floor of circularly sawn wood, laid at 45 degrees. It also has a finished ceiling of 2x4s. An open chimney in this area has rotted the joist around the smoke flue opening. Artifacts in the interior are acting as a conduit for pests, such as powder post beetles. Fresh frass on the floors, walls, and wood materials inside are evidence of an active termite colony. There is an extreme powder post beetle infestation in artifacts kept in the shop. The west interior wall reveals the original exterior siding to the blacksmith shop.

Recommendations

Foundation:

- The site needs a drainage system to direct water away from the building.
- The trees at the northwest end should be removed to prevent further upheaval of the foundation.
- The large cracks at the northwest end should be evaluated by a mason and repaired.
- The posts supporting the front and east side porches should be raised from the ground.
- The foundation pier on the west side causing the bow should be reset, and the wall pulled back into line.
- The foundation pier supporting the post by the door should be reconstructed so it can properly support the post.
- Reestablish post's footing and foundation on the privy.

Walls:

- Clean all of the walls with a water/soap solution and a non-abrasive brush.
- Repair windows as indicated.
- Replacement of specified clapboards, see figures.

Windows:

- See Window Schedule.

Roof:

- Brick chimney should be repointed and covered with a stone cap to prevent further water damage.
- Because of water damage, rusting and leaks, roof needs to be completely replaced with a similar style and material.

Interior:

- Interior steps leading into carpentry shop should be repaired. This is a safety threat to visitors.
- The ceiling in the carpentry shop has severe leaks. Planks need to be dried out and lightly brushed with a water-bleach mixture.
- All items should be removed from the building, inventoried, catalogued and photographed. The interior should be sprayed and treated for insect (damage, powder post beetles). Individual pieces should also be sprayed and treated. Need to select the materials/items in the building that are relevant to the education mission, and remove unnecessary materials from the site. Consider Boracare to treat all surfaces.

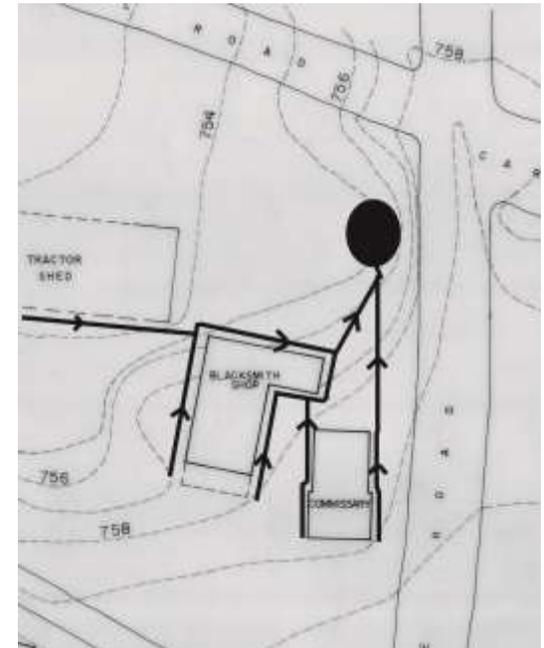


Figure B-16: Site Plan

c. the cotton gin



History

The Shields-Ethridge farm potentially possessed a gin as early as 1874 as Alexander A. Hill, the operator of a gin in the Mulberry community, purchased gin equipment from James Shields' estate. An 1899 plat notes the location of a gin house, although different from the one present on the property today. The gin pictured in 1899 is located on the same side of the street as the main residence and across from the "Cam Shields House."

Ira Ethridge oversaw the construction of the farm's newest gin, a steam driven machine built in 1900, which was meant to serve the family's production as well as that of neighbors. It was with this 1900 update that the location of the gin was moved to its current placement. By 1903, he ginned 197 bales, increasing output to 265 bales two years later. No doubt, his hopes escalated during this time as cotton prices and yields gradually increased. Between 1899 and 1909, the average yield for the county increased by 23% and cotton sold for thirteen and fourteen cents a pound. Ira purchased an additional fifty-five acres from his father-in-law in 1899 and forty-five acres from neighbor Levi Martin in 1902, which increased his holdings to over two hundred acres.

On the night of September 30, 1910, a boiler sparked a devastating fire in the wooden gin house. The operation suffered a loss of machinery estimated at \$3,000, approximately \$500 in seed and four bales of cotton. As the *Jackson Herald* front page announced, "he carried no insurance and the whole is a total loss." The timing could not have been worse with the heavy picking season expected to arrive with the first days of October. As devastating as the fire was, the loss of his gin did not discourage Ira Ethridge from moving forward, and his crop diversity kept him in business. He continued to help his cousin, Tom Ethridge, in Auburn with their co-operated gin and by 1911 had his own gin reconstructed, albeit with a few alterations designed to reduce the risk of a similar accident. First, Ira utilized his brother, Scott's, concrete blocks for the wall structure. Second, a water tower was installed in the middle of the complex by 1913, and finally, he bought insurance to cover the machinery and building.

Scott Ethridge was the older brother of Ira and owned diversified holdings in Jackson County, not only farmland but real estate in the city of Jefferson. He developed a concrete block business and held the patent on the ‘Miracle Hi Lo’, an ashlar-faced block utilized for a number of local buildings, including Ira’s second gin house. (Stallings, 2002, p. page 37)

Research for this report shows, however, that while Scott Ethridge’s concrete plant in Jefferson was an authorized local manufacturer of the “Miracle Hi Lo” concrete block, the actual patent holders were O. U. Miracle and W. L. Dow of the Miracle Pressed Stone Co., Minneapolis, MN, whose design for the Miracle Hollow Block was obtained June 9, 1903 and bore Patent No. 730,780. In their Wednesday, August 3, 1904 “Exhibition Notices”, the *Manitoba Free-Press*, Winnipeg, published a letter from the Harrington & Milligan lumber dealers of Jefferson City, IA to Miracle and Dow attesting:

Gentlemen – The Hand-tamping outfit that we bought from you is working fine. Three putting blocks in the wall today that has been made only four days. They need careful handling, but we have no trouble with them. The outfit is all right, and the blocks come out good and smooth with good square corners (Heritage Microfilm, Inc., 2005).

Additional references to Miracle Hollow Block local manufacturers located throughout the United States confirmed that Scott Ethridge was, in fact, a local holder of the patented fabricator which stamped the patent information on each of the concrete blocks as can be seen in the Cotton Gin located on the Shields-Ethridge Farm, as well as in Scott Ethridge’s Jefferson house and the Jefferson First Christian Church.

Between 1915 and 1921, Ethridge Gin increased production by almost 47%, ginning over one thousand bales for the first time in 1919 as countywide yields increased to 267 pounds of lint per acre. But with success also came setbacks; the boll weevil arrived in Jackson County in 1919, and county wide the production of cotton dropped 57%. Ethridge Gin’s most dramatic reduction occurred between the 1921 and 1922 season, showing a 51.3% decrease in output. Weevil prevention continued over the next two decades as a regular part of farm maintenance.

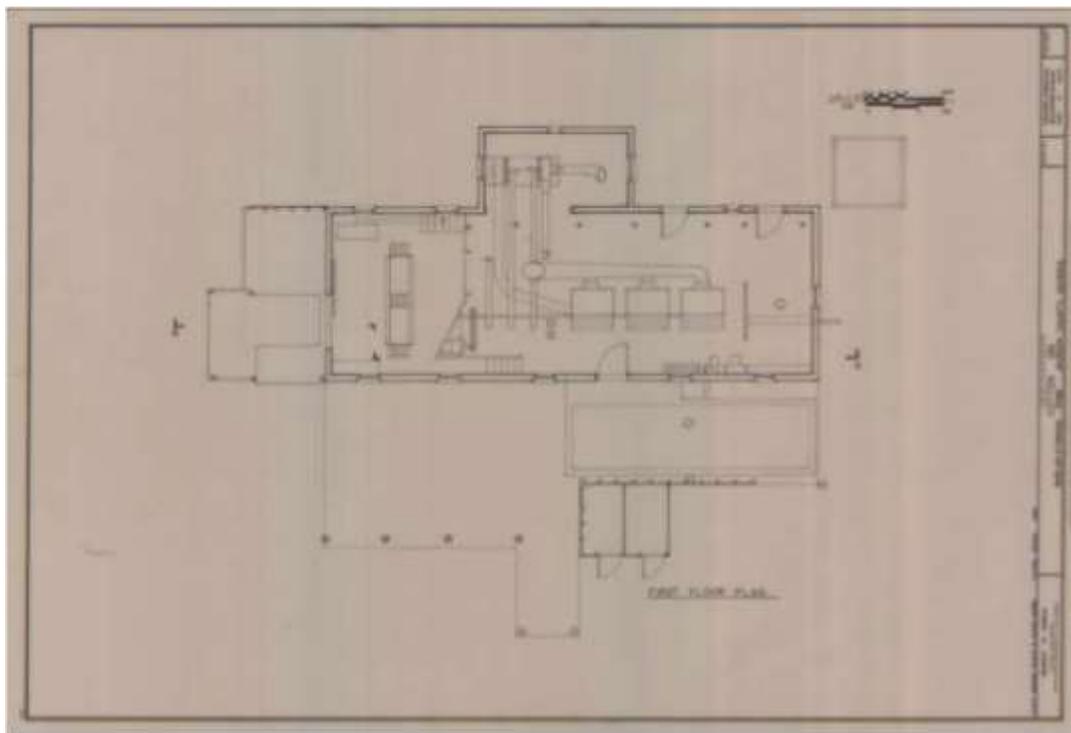


Figure C-1: Floor Plan

By the late 1920s, Jackson County and Ethridge Gin saw a brief reprieve. While in 1923, Ethridge saw a low production of 425 bales of cotton, by 1927 the gin was churning out over 1,000 bales per season again. This revived market encouraged Ira Ethridge to upgrade his gin, and the 1929 records show that he requested the latest catalogues on machinery for his gin complex from developers. The agricultural field had made significant strides in the early twentieth century in terms of efficient machinery, and the Ethridge gin was lagging behind its newer counterparts.

The Lummus Cotton Gin Company in Columbus, Georgia received Ethridge's order for a 3-80 saw outfit as well as a condenser, and the order for a Cameron Automatic Trampler was passed on to Machine and Supply Company in San Antonio. Ira Ethridge expected this more efficient equipment to be installed during the summer to be ready for picking season, however letters between himself and Lummus show disagreement regarding the particulars of the machinery and his gin building.

Lummus indicated that proper installation of the new gin required significant alterations to the gin house roof, changes vehemently opposed by Ira Ethridge. “I don’t want to cut up my house,” he replied in late custom fit would be possible. Four days later, he again responded to further suggestions reading blue prints,” he wrote, advising that Lummus simplify their instructions. The next towards compromise. “It seems,” he typed, “that it is very hard for us to get our minds in regard to making changes in our gin plan.” On the morning of July 10, Mr. Ira stepped while surveying the predicament, thought of altering the machine in order to “eliminate a Lummus representative C.T. Knight’s arrival so that he could verify the feasibility of his Lummus designed the engine to Mr. Ira’s specifications, yet problems still plagued the

By August 2, the parts arrived, but the plans had not. To make matters worse, one part arrived bent, and when the workers attempted to straighten it, it broke. Nevertheless, by the end of August the shiny new engine chugged out its first bale of cotton, just in time for the heavy picking season. Minor mechanical difficulties periodically afflicted the operation, though. In late September, he wrote to C.T. Knight complaining about the middle gin clogging up. “We don’t understand these gins yet,” he wrote in exasperation. “We get very much dissatisfied some times and wished that we had not of bought them.” Yet, the correspondence indicates that despite the difficulties, the new gin experienced heavier than expected volume, and by November Ira Ethridge wrote, “This is one of the finest gins we ever saw.”

During the 1930-31 season, I.W. Ethridge & Son ginned 1,162 bales, a 6.8% increase over the previous year. Mr. Ira yet again increased his holdings, bringing his total acreage to over 650 acres by 1932. However, the Depression, governmental programs, drought, and further technological advancements in cotton production conspired to change the agricultural scene even more. The Ethridge Gin reached its peak during the first season with his beloved 3-80 outfit.

With the price of cotton falling as the depression deepened, the cotton acreage was reduced between 1933 and 1935. By 1942, the Ethridge gin produced a mere 500 bales—barely enough to stay afloat. Cotton remained a labor driven crop at ShieldsEthridge until after World War II. In 1940, the farm received a notice from the Cotton Manufacturers Association of Georgia warning that “when mills receive cotton which is

to the gin house roof, changes June, and subsequently asked if a about his roof. “I am not much for few days showed little progress made up so as to not act intelligently down to the gin house grounds and, double drive.” He eagerly awaited new design. Upon Knight’s approval, installation.

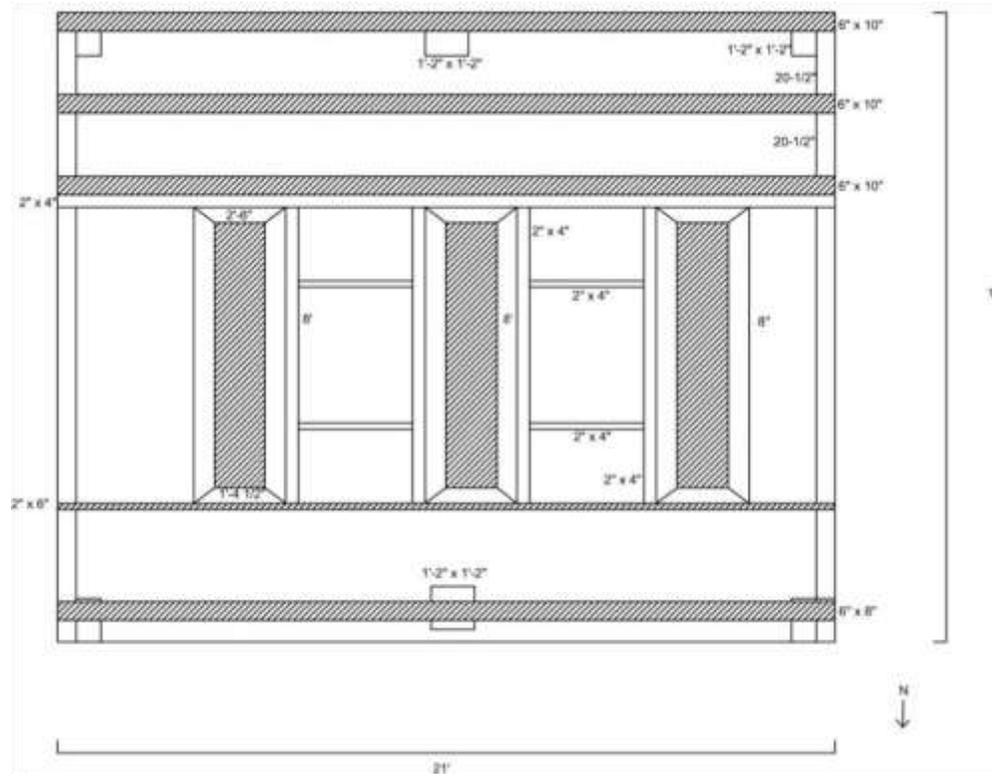


Figure C-2: The Cotton Gin-Baler Platform Floor Structure

not smoothly and properly ginned it means that either their waste increases or defects occur in the goods produced.” The times and technology were changing, and again newer, more efficient machines were at the forefront—this time almost eliminating the human labor force from the cotton process. Small farmers could not afford the high price of this modern equipment and the Ethridges saw what was ahead. The first bull for cattle breeding was purchased in the early 1950s, and mechanical cotton pickers were briefly experimented with in the 1960s.

By the 1960's, technology enabled gins to produce a bale in less than ten minutes, a substantial drop from Ira Ethridge's 16.5-minute bale. Records show that his son, Lanis Ethridge, tried to modify his father's gin with various components, but considering the sharp decline in production of local cotton and the cost of refitting the gin, he must have realized the days of Ethridge & Son were drawing to a close. The cotton gin finally closed in 1964, and the last cotton crop was grown on Shields-Ethridge Farm in 1969. By 1970, the small sharecroppers' village was a ghost town. The land was allowed to return to pasture and now serves as a poultry and cattle farm.

The north extension of the main room was a product of the installation of new gin machinery in 1929. Letters between Ira Ethridge and Mr. Lummus that are documented in a thesis by Patricia Stallings supports this assertion. These letters show that despite Mr. Lummus' recommendation to make changes to the gin building, Ira Ethridge maintained his adamant stance that he would not "cut up" his building. The resulting compromise was the north extension and a slight modification to the gin specifications by Lummus.

It is theorized that the west brick addition was constructed in 1951 during Lanis Ethridge's modifications to upgrade the gin machinery to be electrically powered. It was also during this time that the loading dock door on the south façade was reduced in size and the porch roof lowered. The electric balers, as part of this upgrade, were attached to the interior of the southern wall, and are likely in large part responsible for a crack that currently runs down this façade from cornice line to the corner of the door lintel.

The ginning technology currently present in the Cotton Gin consists of one boll trap, one separator, the distributor, the feeder, three 80-saw gin stands, a seed trap, and two balers (or presses), all of which were powered by an electric motor near the gin that also drives two blowers which are housed in the brick addition to the west side of the structure.



Figure C-3: Deterioration of foundation on the northern end of the western facade



Figure C-4: South elevation

Current Conditions

General Overview

The Cotton Gin building is a tall, single story concrete block structure with several additions that have been made to it over time. The concrete blocks are hollow core, unreinforced, cast textured face block. The front (south) elevation has a parapet wall, concealing a single sloped roof. There is a shed-roof covering the loading dock at the main entrance that is located approximately mid-height of the wall. It also has a covered weigh station area on the east elevation that is nearly as tall as the main building. There is a small brick addition on the west elevation and a full-width extension added to the north elevation.

In general, the concrete block is showing evidence of deterioration, typically and consistently along the top half of the blocks that are exposed to weather, with the hard surface having been eroded away over time, exposing some of the aggregate and softer materials beneath. The block itself has also severely darkened in areas where water has run down the wall over the years, although all of the blocks are darkened from lack of maintenance and general cleaning. Numerous insects, particularly dirt dobbbers, have made their homes on the walls, the windows, the doors and the roof. The attached wood structures are in varying states of disrepair.

Exterior

Foundation

The building is situated on a slightly sloped grade, with the main floor zero feet above grade at the south end to approximately 4'-0" above grade at the north end. The foundation of the main structure is constructed of cast-in-place concrete with a chamfered edge serving as a water table. There is a multitude of leaves, dirt against the foundation, and a significant amount of vegetative growth is evident on the foundation itself. Additionally, at the north end of the west elevation, there is significant deterioration of the face of the concrete foundation, as evidenced by the exposed aggregate (Figure C-3). The concrete foundation on the main building appears to have a smooth surface, while it is obvious that the concrete foundation on the north extension was formed with the use of wooden boards.

Walls

South Elevation

The main front elevation of the building is constructed of hollow core cast concrete block with a textured face (Figure C-4). There is evidence immediately over the main door that its

conceivably from iron-oxide jacking. There is a vertical crack that begins adjacent to the front entry door near the west side of the new lintel and travels vertically upwards height has been modified from its original location, as a concrete lintel has been installed and smooth face block infilled over the top of the new lintel. There is a horizontal crack that has developed across the entire length of the concrete lintel, through both the mortar joints and the concrete block (Figure C-5). The crack appears to be a tension crack and its width varies from 1/4" at the base to 3/4" at the top of the parapet (Figure C-6). It is suspected that the crack may have begun at the new lintel but was exacerbated by the vibrations of the new cotton baling equipment, which has been braced by attachment to the interior face of the south wall. (Some of the cracking may also be attributable to the fact that an existing window opening was enlarged into an oversized door on the west exterior wall to provide access to the small brick addition, which was needed to accommodate equipment changes.) There is evidence of green algae growth on the underside of the concrete lintel.

The block appears to have a whitewash finish beginning about the seventh course above grade and in general is peppered with a smattering of insect nests and black dirt. Overall, the mortar seems to be in good condition, but there is a row of holes, some of which have been patched with mortar, which appear to be evidence of the previous location of the porch roof. This row of holes also coincides with the line at which the whitewash is located, further supporting the theory that the previous porch roof was higher than the current one.



Figure C-5: The crack measures 1/2" at the parapet cap.



Figure C-7: Egg and dart cast parapet cap with missing section



Figure C-8: Parapet cap with evidence of organic growth

Figure C-6: Cotton Gin south facade crack

Terminating the top of the wall is a stepped parapet that has been ornamented with an “egg and dart” cast stone parapet cap (Figure C-7). The cast stone cap is exhibiting signs of moisture retention, and pieces of the ornamentation have begun to fracture and break off. The height of this parapet makes this a significant concern, as the falling pieces could cause damage to the building as well as to anyone who happened to be below. There is also a large amount of organic material sprouting from the top of the cap (Figure C-8).

Oddly enough, on each elevation, in addition to the typical textured face concrete block, there are a few half-blocks with a decorative face (leaf pattern) that appears to be inserted adjacent to or near to windows and door openings. There seems to be no regular pattern for their location, as some are at the sides, top or just nearby to an opening. Additionally, some are installed upside down and some right side up.

Located on the south elevation a shed roof has been constructed over the loading dock area and is attached to the main south elevation by rafters resting upon a ledger beam bolted to the concrete block. Immediately above the loading dock roof on the southeast corner of the building, there is a vine protruding through the mortar joint between two blocks that is causing the block to be pushed forward from the face of the wall. Between the interior flooring and the loading dock, a concrete threshold has been poured at the main entry door that has the date 4-6-51 scratched into it.

West Elevation

The block and mortar are in similar condition to that on the south elevation, in need of a good cleaning, but appearing to be of generally sound condition. The concrete header located over the door on the west elevation has exposed aggregate and the wood frame door surround at this same location is rotting and wicking water (pictured in Figure C-3). An ivy vine has woven its way between several of the roof rafters, causing some separation between the concrete block and the roof structure. The ends of the roof rafters are exposed, several have rotted and deteriorated from exposure to the elements, and several others are exhibiting signs of weathering within the end grain.

Windows located on the west elevation are addressed in the attached window schedule.

There is a small brick addition protruding from the west elevation that is resting on a concrete slab that also serves as the wall foundation (Figure C-9). The brick and mortar of the addition appear to be in reasonably sound condition. The roof rafters that protrude through the brick at the top of the wall are suffering from exposure to the elements, the end grain is showing significant wear, and the fascia boards on the north and south sides of the brick addition have almost completely deteriorated.

A significant crack has developed between the main building and the north building extension that varies from 1” at the foundation to approximately 4” at the roofline (Figure C-10). This gap is caused by the settlement of the addition and is a cause of serious structural concern. It probably results from the weight of the large concrete foundation wall and the structure it supports combined with improper bearing capacity of the soil. Water saturation of the soil at the foundation is exacerbating the foundation settlement.

North Elevation

The north elevation consists of a mixture of smooth faced and textured faced unreinforced hollow concrete blocks. It appears that the original north exterior wall was removed and the building was extended by re-using the original textured face blocks mixed with smooth faced blocks. These have been laid randomly on all three elevations of the extension. There is evidence of an abandoned electrical knob and tube system mounted to the exterior wall. There is a large metal auger protruding from the foundation wall for several feet, for trash removal when the cotton was cleaned, that poses a potential safety hazard. Windows located on this elevation that are addressed in the window schedule.

East Elevation

The east elevation is, like the other building elevations, constructed of unreinforced



Figure C-9: Cotton Gin west elevation

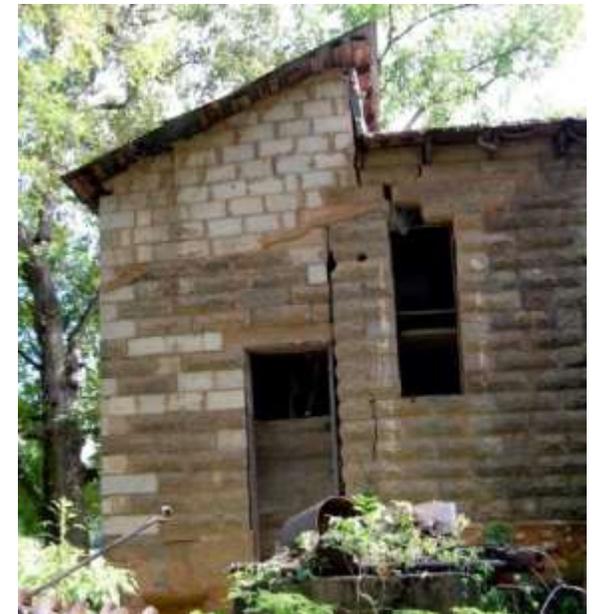


Figure C-10: Crack between the main structure and the north extension



Figure C-11: Cotton Gin east elevation. Note the shed structure, to the right in this image , which is shielding the weight station.

hollow concrete block resting on a concrete foundation wall (Figure C-11). There are concrete lintels over each of the wooden windows in varying states of decay, with some of the concrete completely spalled off exposing the wood lintel beyond. A crack that mimics that on the west elevation is located between the main building and the north building extension. It, too, is approximately 1” wide at the foundation and opens up to approximately 4” at the roofline.

Significant deterioration of the block surface is occurring near the base of the southeast corner below the southernmost window. It appears that this has been affected by rising damp. Also at this southernmost window, the ends of the jamb block have been significantly damaged; it appears that the bottom sash of the window was replaced and the destruction of the jamb blocks occurred while removing the original sash. Adjacent to the southernmost window is a small casement window that has a small vertical crack extending upwards from it. This crack does not appear significant and seems to be caused by movement of dissimilar materials between the window and the wall. The windows and doors located on this elevation are addressed in the window schedule.

East Elevation Weigh Station

Extending across the entire east side of the building is a covered area (Figure C-11). The southern half of this area is dirt

and ends at the entrance doorway, at which point a large scale used for weighing the cotton buggies was constructed of a concrete perimeter with a wood platform scale. The southern section has a grade that slopes such that water can enter into the east elevation entrance door. The roof structure is supported by four 6" x 6" wooden posts, spaced approximately 7'-6" apart on 10" x 10" concrete piers that in turn support a beam with rafters mounted on top of it. The northernmost concrete pier is significantly deteriorated, exposing much of the large aggregate. The rafters tie into the main building with a ledger beam which transitions into rafters that are embedded into the concrete block wall (this change in construction type is necessitated by the transition from a high roof to a lower roof within the main building).

At the wagon scale, there is a wall that supports the east side of the porch roof that is constructed of 6" x 6" posts located at each end of the wall (Figure C-12). 2" x 6" vertical studs spaced at 24" on center are located between these 6" x 6" posts. These were all originally resting on a wood sill which has since largely rotted away. Only a small piece of the sill located on the southern end of the wall still exists. Because of the deterioration of the sill, the ends of the vertical studs are now generally resting on the ground, are wicking water, which in turn is saturating the lower portion of the siding, causing fungal growth to appear on the wall. Additionally, the north end of the wall (where the sill has completely disintegrated) has sunk, causing the siding boards to slope downwards from south to north. As this wall has dropped, it has pulled the roofing such that it is now pitched at an odd angle.



Figure C-12: Weigh station with wall supporting porch roof to the right in this image

At the south end of the weigh station wall façade, there is a small shed structure (pictured in Figure C-11). The structure bears on fieldstone piers and in general is in good condition, having had new roof rafters of pressure treated lumber and a new metal roof installed relatively recently. The top of the roof is not visible, however, having been piled high with leaves and tree debris from the surrounding landscape. The horizontal wood siding on the shed structure is butt jointed, and there are a few boards where large gaps have appeared. The siding also contains some evidence of green paint. Within the siding are two access hatches, one on the south elevation and one on the east elevation, that are in good condition and constructed of vertical butt jointed boards which are mounted to the siding with strap hinges. Some of the vertical boards, like the horizontal siding, have large gaps between the boards. The floor of the shed structure is dirt and appears to have always been. *South Elevation Loading Dock*

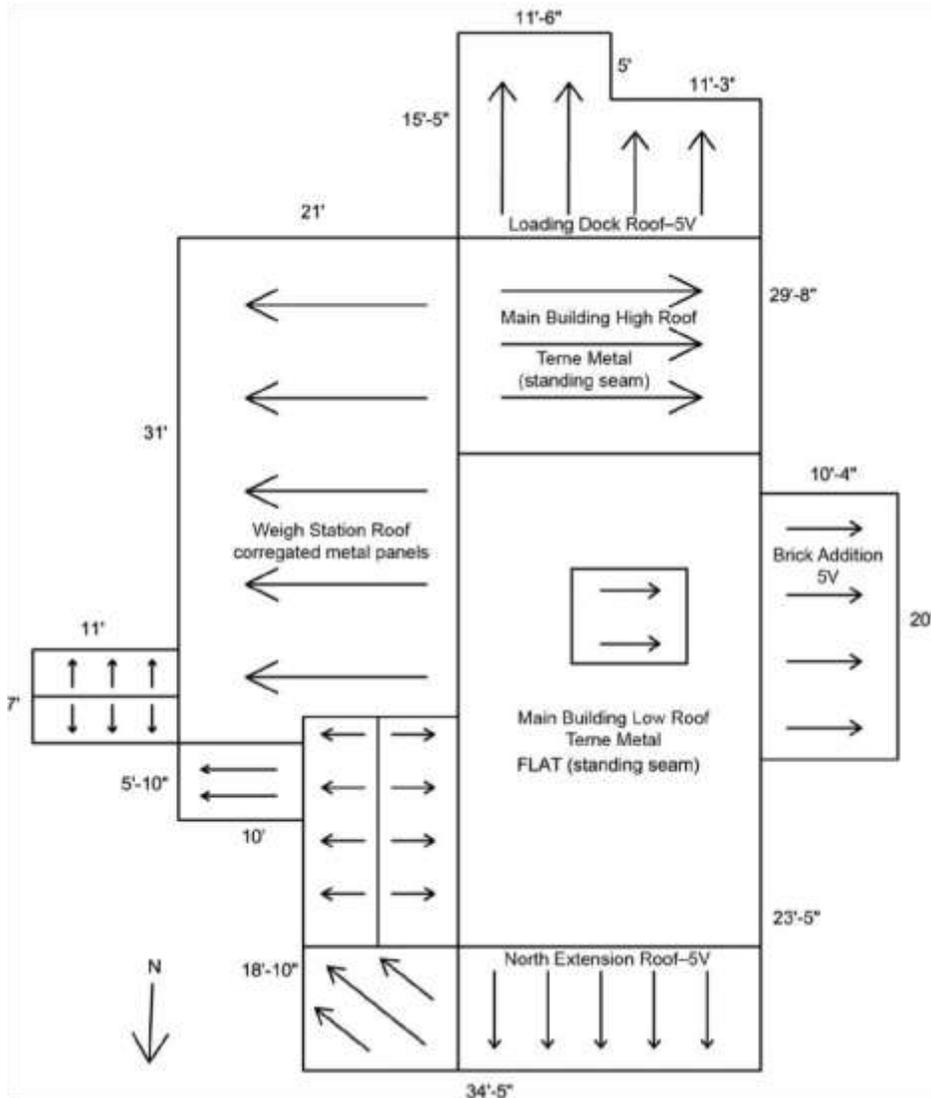
The elevated dock has been constructed on concrete piers, with the south end resting on a concrete grade beam that extends the width of the south elevation (seen in Figures and C-4 and C-11). Sill beams are attached to the concrete foundations with large anchor bolts and a new girt is located at mid-span that is pressure treated lumber. The joists that support the dock are 4" x 6" on one section of the dock and 2" x 6" on the other section of the dock, spaced approximately 18" to 24" on center. There is extensive termite damage in the sill beams, with only the heartwood remaining in several locations. The wood plank flooring for the dock ranges in width from 8" to 12" and is generally in fair condition, although there are a few boards that have significant termite damage and a few whose ends have been compromised by rot. The dock roof is supported by wooden posts that in turn support a beam upon which the wooden rafters rest. The rafters attach to the south elevation of the building with a ledger beam.

Roof

The roof is supported by 2" x 10" rafters spaced at approximately 24" on center that are in varying states of deterioration. Several have previously rotted through and have 2" x 12" sister joists anchored to them with 1/2" bolts staggered in a random pattern. There is 1" x 6" cross-bracing

Figure C-13: The Cotton Gin-Roof Plan

located at mid-span of the joists. Much of the joist repair



that has been performed previously is structurally inadequate and does not have proper bearing. The roof sheathing is created with random width boards varying from 1" x 6" up to 1" x 12" and appears to have been installed with an intentional ½" gap between the boards. There is evidence of significant water infiltration that is continuing to deteriorate the roofing rafters and sheathing.

The roof is not formed by a continuous plane, but has many elevations (Figure C-13). All are covered with either standing seam terne metal or five-V metal panels. All are in dire need of basic maintenance and cleaning, having accumulated a multitude of leaves, dirt and debris. In some cases, the accumulation is sufficient to have allowed vegetative growth to begin. There are numerous trees located in close proximity to the Gin that drop leaves, walnuts, branches, and other organic matter onto the roof, exacerbating the problem. There is a significant amount of rust evident on all of the roofing surfaces as well. Additionally, with the exception of the terne metal roof areas that have no visible mechanical fasteners, all other areas of roofing have been attached to the substrate with face nails. In most cases, the nails have either popped up or the rubber washer has deteriorated providing an opening susceptible to water infiltration. There is a significant amount of water infiltration into the building from many of these nail holes, from failing metal roof seams, as well as from improperly flashed transitions between roof planes.

Main Building High Roof

The highest-level roof is a single slope constructed of standing seam terne metal and located on the southern most section of the building (Figure C-14). It slopes shallowly, with the west side being the higher elevation and sloping towards the east at a uniform rate. The roof metal itself shows evidence of having been patched in an "L" configuration and the intersection of the original metal and the patches have been sealed with what appears to be caulk and/or an aluminized coating that has exceeded its life expectancy and is peeling off.

On the high end a parapet extends above the roofline and the roofing material rolls up onto the back of the parapet wall, but does not cap the top of it. On the other three sides, the metal roofing extends over the edge of the roofline.



Figure C-14: Standing seam terne metal roof with "L" shaped patch



Figure C-15: Half-round gutter remains on the Cotton Gin



Figure C-16: Mixture of standing-seam terne metal and modern 5V metal surrounding former clerestory

On the west side of the roof, the remains of a half-round gutter are visible although not functional, as it is largely deteriorated and what little remains is filled with debris (Figure C-15). The gutter appears to have been attached to the structure with a twisted loop wire. Some of the vertical roof seams located near the gutter have been flattened.

On the east side, the roof metal turns vertically downward onto a fascia board that is in good condition. The roof rafters behind the fascia board are circularly sawn 2" by 10"s and appear to be in good condition. The roof rafters extend beyond the face of the concrete blocks and a gap of up to 1" exists between the top of the concrete blocks and the roof decking. The decking is constructed of boards measuring approximately 1" x 8" with small gaps located between each board.

On the north side, the metal roof extends beyond the edge of the roof decking approximately 2". There is one remaining piece of what may have been a soffit board installed immediately beneath the sheathing boards that is in the final stages of deterioration. All other soffit boards are non-existent, but the nails from their previous installation are visible remains of what may have once been there.

Main Building Low Roof

This roof is a single slope covered with a mixture of standing seam terne metal and a more modern five-V metal roof located between the southernmost high roof and the north extension roof (Figure C-16). There is no significant pattern to the variations in metal types, seeming to be a mixture of patches and repairs in random places. The roof slopes shallowly, with the west side being the higher elevation and sloping towards the east at a uniform rate. The terne metal portion of the roofing measures in panels 2'-0" wide by approximately 2'-2" long.

In the central area of the roof, there is a clerestory that has been sided with vertical galvanized steel panels, although it appears that it may have previously held glass lights, as there are some panes resting on the adjacent roof. From inside the gin, it is evident that there is a window sash located within the clerestory framing. There is a large, well-constructed terne metal roof cricket located on the east side of the clerestory. Dirt and debris have accumulated to the point that the cricket is no longer working in the manner intended. The roof of the clerestory has been covered with five-V metal

roof, overhanging exposed 2" x 4" rafters that are showing signs of weathering from exposure to the elements. It appears that the rafters may have been previously painted, as there is minimal evidence of paint on their ends.

On the south end of the low roof at the transition to the high roof, the metal wall panels appear to be galvanized, corrugated metal applied to 1" x 6" horizontal sheathing boards spaced approximately 3" apart. The metal wall panels are rusting, although none appear to be rusted through.

On the north end of the low roof at the transition to the slightly higher roof on the building extension, metal wall panels have been haphazardly applied to the vertical face of the extension, giving the appearance of having been piecemealed together (Figure C-17). While some of the metal wall panels are cut around the roof rafters, most simply abut the underside of the roof rafters and are therefore not sealed to the underside of the roof decking, allowing the possibility of water penetration into the building extension, as well as providing openings for insects and other debris to filter through.

North Extension Roof

This roof is covered with five-V metal roof panels that slope uniformly from the south down to the north end. The metal decking is installed on spaced lath over 2" x 4" rafters. The condition of this roof, like the others, is poor and in need of replacement.

Brick Building Addition Roof

This roof is covered with five-V metal panels that slope uniformly from the east down to the west end. The metal decking is installed on spaced lath over 2" x 4" rafters. The condition of this roof, like the others, is poor and in need of replacement.

East Elevation Weigh Station Roof

This roof is constructed of two types of corrugated metal panels that slope uniformly from the west down to the east end. The metal decking is installed on spaced lath over 2" x 4" rafters. The condition of this roof, like the others, is poor and in need of replacement.



Figure C-17: North elevation 5V roof with haphazard metal wall panels



Figure C-18: Battered concrete piers in



crawlspace; also note the extensive insect and water damage to wooden support.

Figure C-19: Water rivets in the crawlspace indicating continued water penetration.
South Loading Dock Roof

This roof is covered with five-V metal panels that slope uniformly down from the north to the south end. The metal decking is installed on spaced lath over 2" x 4" rafters. The condition of this roof, like the others, is poor and in need of replacement.

Interiors

The main building floor is a cast-in-place concrete slab-on-grade that is generally continuous through the east addition and north extension and is flush with the east entrance to the building, but is approximately 4'-0

lower than the loading dock entrance to the building. The concrete slab stops approximately 15'-0" north of the southern wall, where an elevated wood-framed platform is constructed with a crawl space beneath.

The crawl space has a dirt floor, perimeter concrete foundation walls on all sides, and is approximately 4'-6" high to the underside of the floor joists. Within the crawl space are three substantial battered concrete piers that taper from 1'-4 1/2" wide at the top to 2'-6" wide at the bottom and 7'-2" long at the top to 8'-0" long at the bottom (Figure C-18). These piers support the bale press that rests on them. The crawl space framing is constructed largely of 6" wide by 8" deep floor joists spaced at approximately 2'-2" on center that are supported by 4" x 8" wood posts resting on concrete piers. All of the wood posts have visible signs of termite damage, powder post beetle damage and water damage. Without exception, penetration into the base of each of the posts reaches 1/2". Additionally, many of them are significantly rotted out at the bottom. There is also evidence of continuing water infiltration into the crawl space, as rivulets in the dirt floor are visible (Figure C-19) and much of the surface of the concrete foundation walls is spalling due to rising damp. Additionally, on one trip, shortly after a rainstorm, standing water was observed in the crawlspace (Figure C-20).

Above the crawl space, the wooden platform is constructed of wood decking that is in good condition but retains a significant amount of moisture. The top of the concrete piers protrudes through the flooring slightly to allow direct attachment of the equipment.

The perimeter walls are the inside of the exposed concrete block and no additional surface treatment has been applied. The south



Figure C- 20: Standing water in the Gin crawlspace after and rain storm.



Figure C-21: Opening from the west addition into the main structure. Note the rough block edges and the wooden lintel.

wall has a sliding wooden door that serves as the main entrance. There are no side jambs on this door, allowing exposure of the interior of the building to the exterior elements. The ceiling structure is exposed and is constructed of 2" x 10" rafters spaced at approximately 24" on center with diagonal bridging between the rafters. Water seepage is evident at the top of the wall, presumably entering from the deteriorated parapet cap, and the ends of the roof lath and rafters are wicking water. The majority of the cracks visible on the exterior are telegraphing through to the interior as well.

Many of the roof rafters for the low roof area have suffered water damage in the past and have been repaired or supported with added wood material.

At the west brick addition, what was previously a window opening (evident by the concrete lintel that remains in the wall just above the new lintel) has been enlarged to a wide doorway. However, the opening in the wall was created very roughly, with no regard to aesthetics or to performing a "neat" job. The block edges are rough and broken and there is no consistent jamb opening (Figure C-21). A wood lintel has been installed with insufficient bearing to properly support the concrete block located above, and cracking is evident in a triangular pattern above the lintel. The floor is concrete slab on grade, the walls are exposed brick, and the roof structure is exposed above.

At the north building extension, significant cracking is occurring between the end of the original building (exceeding 4" in width at its widest point) and the "new" extension, as if the extension is "falling away" from the original building (Figure C-22). The floor slab is heaving upwards at this line as well, and is already displaced approximately 2". As with the rest of the building, the walls are the inside of the exposed concrete block and the roof structure is exposed above.

Throughout the entire building, daylight is visible through both the walls and the roof in several areas, indicating clearly that the building is not watertight. Additionally, there are several windows whose panes have been completely removed and replaced with chicken wire, speculatively to provide ventilation, leaving a large opening for further water infiltration. The many openings also provide access to the interiors for various insects and small rodents and even a random snake.

Recommendations



Figure C-22: Crack between the end of the original building and the extension. The floor slab of the “new” addition is heaving upwards.

Initially, so as to prevent continued build-up of organic material on the building roof and around the building foundation, the many large trees surrounding the building should be pruned to prevent their branches from overhanging the structure. The organic debris should be cleared away from the building for several feet and the grades adjusted to insure proper slope away from the building. The grade should also be cut and shaped on the east side of the building to insure that water does not run into the east elevation entrance door, as it currently does. This will hopefully solve part of the problems of moisture build-up and organic growth within and on the building structure itself.

Vegetative growth should be removed from the building and a thorough cleaning of the building should be performed. To clean the masonry and concrete, a cleanser, such as Prosoco's Heavy Duty Restoration Cleaner should be used.

It is recommended that the entire structure be inspected and treated as necessary for insects by a licensed professional to avoid any future damage. Periodic inspections for insects should be incorporated into an ongoing preventative maintenance plan.

Regarding the north extension of the building that appears to be separating itself from the main structure, it appears that it is likely continuing to move, and it is suggested that it be stabilized initially with temporary shores applied to the north face of the wall until such time that a more permanent remediation, such as tie rods that will span the length of the building, can be professionally engineered and installed. Once these are in place, a crack monitoring system should be applied to the building face and periodically inspected through an entire change of seasons to verify that movement has ceased. Once this is determined, the cracks in the exterior wall can be filled with mortar.

On the south elevation, a crack monitor should also be installed to verify that the crack is not continuing to enlarge. If, as suspected, the crack was created and enlarged by virtue of the vibrating baler, it is possible that the crack is no longer moving. Once this can be verified, the crack can be filled with mortar.

There are a few locations on the structure that need to be patched, such as the

holes on the south elevation from where the porch roof was lowered, the grout around the access door on the east elevation to seal the gaps in the wall, and the broken block where the window sash was replaced. These areas should be repaired with hollow core miracle block and with mortar consistent with that used in the original building construction in texture, color and consistency. Once the repairs have been made, the concrete block walls should be treated with a consolidant, such as Prosoco's Weatherseal Blok-Guard, to allow them to retain their substance and to prevent further deterioration of the exterior surface finish.

The concrete that has been used for the lintels should be analyzed and a similar mixture created to patch them to avoid further deterioration. A bonding agent should be applied to the existing substrate prior to application of the new concrete to allow for proper adhesion between the two surfaces.

The crawl space is taking on a significant amount of water, partly as a result of water seeping through the wall, and partly because of the openings within the space that are not sealed (an access door and a window opening with no window in it). A replacement window should be installed in the previous window opening that is constructed of the same wood, details, glass and glazing as the original. It is suggested that for the access door, an interior storm window be installed. This will prevent it from being visible, as it will be hidden beneath the crawl space, but will prevent water infiltration from the access door into the crawl space. Additionally, a vapor barrier should be installed on the floor of the crawl space to minimize moisture infiltration.

As many of the vertical wood supports for the elevated floor over the crawl space



have been rotted and damaged by termites, these should be replaced with either pressure treated lumber or with steel supports. The use of pressure treated lumber, while not historical, would allow the material to remain wood, consistent with the original construction, while the use of steel supports would be more costly, but would provide for a more long-term solution. Because there is already some steel in the building, it would not be introducing a new material; however, it would be uncharacteristic of what would have been done at the time. All of the existing vertical wood supports with the exception of one are already resting on concrete piers, which are in good condition and can remain. One concrete footing will need to be poured for the post that is resting on a concrete block.

All of the doors and windows need to be repaired to some degree and the extent of the treatment recommended for each is included within the door/window schedule. All wood visible on the exterior of the building should be painted to extend its life span. The majority, if not all, of the wood shows some signs or evidence of having been painted initially and re-painting the wood would certainly be in keeping with the original intent of the building design.

None of the old electrical work is active, and as it serves as an example of an electrical system that is no longer in use (knob and tube type), it should remain as currently installed to display the original system.

The duct vents that protrude through the walls serve as additional sources of access holes for insects and rodents. An attempt should be made to find or replicate the pieces to re-connect the duct from the cotton gin to the seed house. It appears that many of the pieces are located beneath, and possibly inside the seed house. Re-connecting all of these components would provide a more realistic picture of the original operation of the farm and would allow the ducts to be extended from an interior space to an interior space, minimizing the openings to the exterior. It is also suggested that insect screens be installed, recessed inside, each end of the ductwork to prevent insects from traveling from one building to the other. Research will have to be done to replicate the supports for this duct.

At the brick addition, the opening that has been created within the original concrete block building should be reduced slightly in width and patched with the hollow core miracle block. This will serve two purposes: it will “neaten” the jamb and will also provide suitable bearing for the lintel that was incorrectly installed. Given that this is a structural design problem, the logic of leaving the opening intact, while having to worry about possible liability and safety issues for visitors, does not seem to be a prudent approach.

If the farm is to remain open to the public, certain safety precautions should be

implemented to minimize the opportunity for accidents. Specifically, the auger located on the north end of the property should have a fence or barrier built around it, and the opening on the east elevation between the buggy scale and the building wall should be infilled with a wooden platform to prevent it from being a tripping hazard.

All of the wood members that are showing signs of damage from termites and/or rot should be replaced if the boards are beyond repair. Materials for replacement should be made with the same species and cut of wood, using materials salvaged from the same time period as those used in the original construction. For those boards that serve as roof rafters and have end grain exposed to the elements, but are in substantially good shape otherwise, a clear epoxy sealer should be used to seal all exposed components of the wood to prevent further deterioration.

All of the roofing with the exception of that on the east elevation porch shed appears to have surpassed its usable life span and should be replaced in its entirety with a suitable metal roof. Ideally, the roofing would be replaced with a terne-coated stainless steel, similar to the original but not needing paint. Until the roof is replaced, the existing roof should be broom cleaned of debris and loose materials to allow a more complete evaluation of the condition and the extent of the repairs that are needed. Possible repairs could include re-attaching the loose metal pieces and installing roofing screws at all locations where the existing nails are loose or popped out. Additional roof patches are needed at the transitions from one level of roofing to another to insure the watertight integrity of these intersections. The gutters should be replaced with the same type of half-round gutter, and it is recommended that a gutter also be installed on the north end to assist in insuring that future settlement of the soil at the north foundation does not occur.

The cast stone coping should be cleaned of vegetative debris and organic buildup and a metal coping cap should be installed on the parapet to prevent its further degradation. While this metal cap was not initially a part of the original construction, it appears necessary to prevent the coping from eventually disappearing from history.

Cotton Gin Door and Window Schedule

1. *Door/South Elev.Main Bldg:*

- Main sliding entrance door constructed of vertical boards mounted on a rectangular frame. With the exception of only two boards that are split or have a knot hole rotted out, the remaining wood seems to be in good condition and needs little in the way of repairs. The wood has been painted. There are no jamb stops or weather seals and there is a large gap that exists between the exterior wall and the door itself.
- Recommendation: Infill the knot hole and repair the board that is splitting with an epoxy patch. A wooden “stop” should be installed to fill the gap that exists between the door jamb and the exterior wall and an applied rubber gasket or neoprene sill should be attached to it to allow a reasonable air and water tight seal to be created between the door and the opening, paint wood.

2. *Window/West Elev. Main Bldg:*

- Double hung window, 6/6 sashes, frame and muntins intact, but muntins in poor condition, no glass.
- Recommendation: Salvage and repair frame, replace muntins that need to be replaced, install new glass, caulk perimeter, paint wood.

3. *Window/West Elev.Main Bldg:*

- Double hung window, 6/6 sashes, frame is almost completely rotted out and only two muntins are visible, but are displaced.
- Recommendation: Replace entire window with new made to replicate original; caulk perimeter, paint wood.

4. *Window/West Elev.Main Bldg:*

- Only a small piece of the window frame is left sitting askew in the opening. It appears that this may have been a fixed four-light window similar to the one on the east elevation.
- Recommendation: Replace entire windows with new made to replicate original; caulk perimeter, paint wood.

5. *Window/South Elev. Brick Addition:*

- Double hung window, 6/6 sashes, overall window is in fair condition. There is evidence of powder post beetles and some termite damage on the bottom rails and sill, a couple of the muntins need to be repaired, all glass is intact, some glazing is missing.
- Recommendation: Selectively remove the deteriorated wood areas, patch with epoxy, repair muntins, re-use existing glass and install new glazing; caulk perimeter, paint wood.

6. *Window/West Elev.BrickAddition :*

- Opening is filled with a perimeter wood frame that appears to be in fair condition and with chicken wire and no glass. It appears that this may have been the original construction.
- Recommendation: Remove the deteriorated wood areas and patch with epoxy, caulk perimeter, paint wood. Install glass pane on inside of frame as a storm window to “close” the opening. Leave chicken wire intact.

7. *Window/North Elev.Brick Addition:*

- Double hung window, 6/6 sashes, sill and bottoms of frame are almost completely deteriorated by termite damage, ivy is located at the meeting rail, evidence of carpenter bees on the stile, all glass is present, but glazing is largely non-existent.

- Recommendation: Remove deteriorated wood and replace with wood components to match existing, remove ivy and repair muntins as needed, re-set glass, install new glazing, caulk perimeter, paint.

8. *Door/West Elev.Main Bldg:*

- Four panel wooden door set in wooden frame. Lintel over door has succumbed to iron-oxide jacking and the concrete face is damaged and the steel is visible. Overall the wood on the frame and the door is in fair condition, with only the bottom ends of the frame jamb showing signs of deterioration.
- Recommendation: Remove deteriorated wood from frames, patch with epoxy, caulk perimeter, paint wood. Repair concrete lintel.

9. *Window/West Elev.Main Bldg:*

- Opening is filled with a perimeter wood frame that appears to be in fair condition and with chicken wire and no glass. It appears that this may have been the original construction.
- Recommendation: Remove the deteriorated wood areas and patch with epoxy, caulk perimeter, paint wood. Install glass pane on inside of frame as a storm window to “close” the opening. Leave chicken wire intact.

10. *Door/West Elev.North Extension:*

- Opening is filled with a perimeter wood frame that appears to be in fair condition and with chicken wire and no glass. There are horizontal wood boards nailed to the frame to conceal the bottom half of the opening.

- Recommendation: Remove the deteriorated wood areas and patch with epoxy, caulk perimeter, paint wood. Install glass pane on inside of frame as a storm window to “close” the opening. Leave chicken wire intact. Remove the horizontal wood boards as necessary to perform the remedial work and then reinstall.

11. *Window/North Elev.North Extension:*

- Double hung window, 6/6 sashes, overall window is in fair condition. A couple of the muntins need to be repaired, some glazing is missing.
- Recommendation: Repair muntins, glaze panes, caulk perimeter, paint wood.

12. *Window/East Elev.North Extension:*

- Double hung window, 6/6 sashes, overall window is in fair condition. A couple of the muntins need to be repaired, one piece of glass is broken, some glazing is missing.
- Recommendation: Repair muntins, replace broken piece of glass with same type of glass as the original, glaze panes, caulk perimeter, paint wood.

13. *Window/East Elev.Main Bldg:*

- Double hung window, 6/6 sashes, overall window is in fair condition. A couple of the muntins need to be repaired, some glazing is missing.
- Recommendation: Repair muntins, glaze panes, caulk perimeter, paint wood.

14. *Door/East Elev.Main Bldg:*

- Wood vertical plank door, overall in good condition. There is evidence of powder post beetle damage, the door frame is showing signs of termite damage at the bottom, and there is evidence of moisture on the bottom of the door and frame.
- Recommendation: Caulk perimeter, remove deteriorated wood and repair with epoxy. Paint wood.

15. *Window/East Elev.Main Bldg:*

- Double hung window, 6/6 sashes, overall window is in fair condition. Bottom sash appears to have been replaced previously, as there is no paint on it. Glazing is falling out.
- Recommendation: Remove old glazing and install new, caulk perimeter, paint wood.

16. *Window/East Elev.Main Bldg:*

- Double hung window, 6/6 sashes, overall window is in fair condition. A couple of the muntins need to be repaired, one piece of glass is broken, some glazing is missing.
- Recommendation: Repair muntins, replace broken piece of glass with same type of glass as the original, glaze panes, caulk perimeter, paint wood.

17. *Window/East Elev.Main Bldg:*

- Triple window, 6/6 light sashes, concrete block jamb destroyed at bottom sash during replacement of window

sash, bottom sash has “star-patterned” glass panes, several pieces of muntins missing, one pane of glass is broken, glazing is falling out in numerous locations, paint visible on upper two sashes.

- Recommendation: Repair wood with epoxy, repair jamb, repair muntins, replace broken piece of glass with the same type of glass as the original, glaze panes, caulk perimeter, paint wood.

18. *Window/East Elev.Main Bldg:*

- Four-light casement window, vines growing through the window, powder post beetle damage, dirt dobber nests, one pane of glass is broken, glazing is falling out in numerous locations, faint remnants of paint still visible.
- Recommendation: Remove vines, repair wood with epoxy, replace broken piece of glass with the same type of glass as the original, glaze panes, caulk perimeter, paint wood.

19. *Access Door/East Elev.Main Bldg:*

- The door is constructed of vertical, butt-jointed wood that appears to be flush at the bottom, but angled at the top such that there is over an inch gap between the door and the frame. There is some powder post beetle damage, but generally, the door is in fair condition. Leave door intact, as is.
- Recommendation: Set a glass pane on the inside to serve as a storm window and caulk it to the masonry opening. The glass will not be visible because it will be within the crawl space on the inside. Paint door.

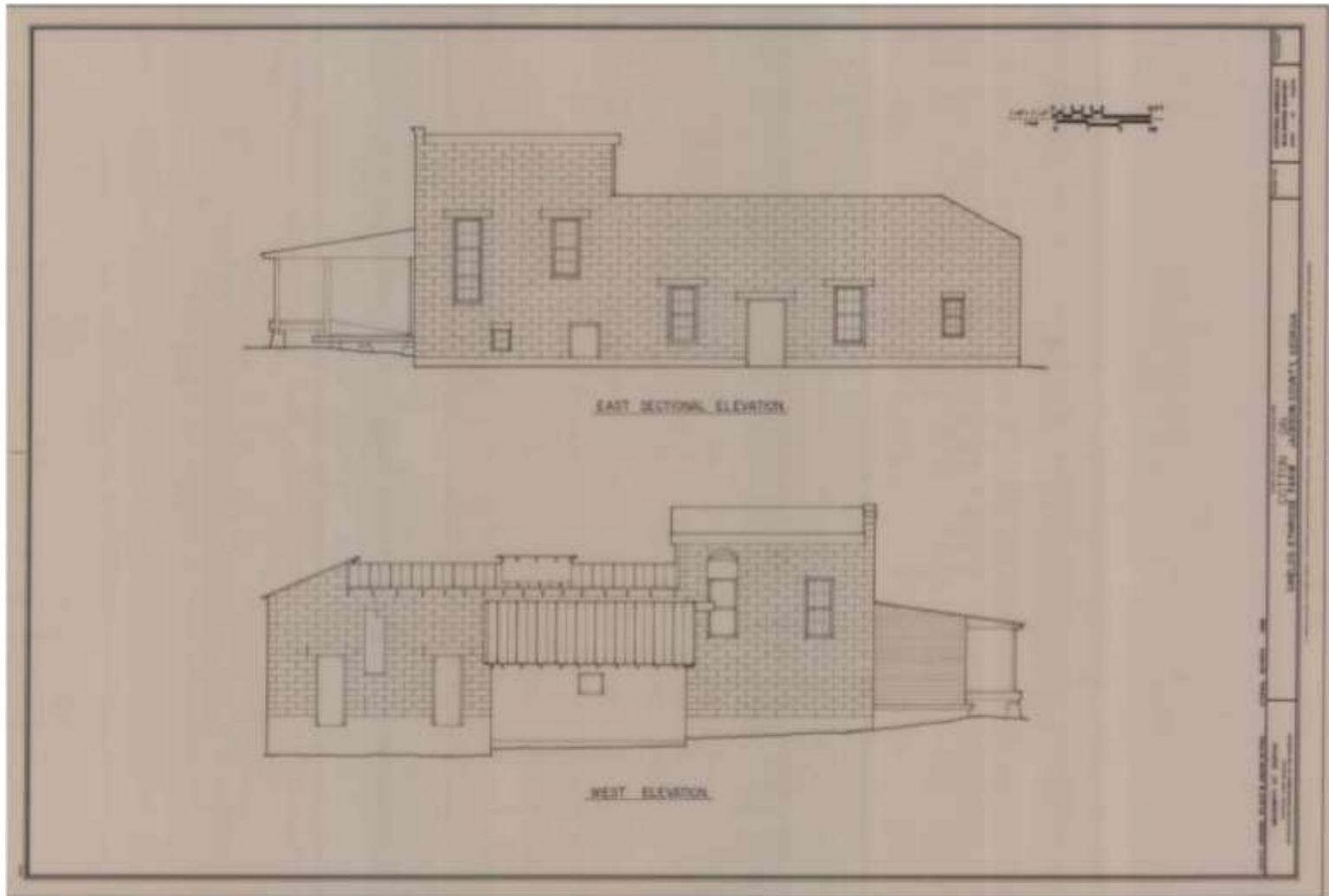


Figure C-23: Elevations

d. the seed house



General Overview

The Seed House is a single story rectangular, wood-framed building with plank siding and a steeply pitched metal gabled roof. It was built about 1904. A metal shed roof porch extends from the east elevation. There is also a small metal shed roof addition extending off the south elevation.

Exteriors

Foundation

The building is situated on a slightly sloped grade, with the floor ranging from zero feet above grade at the south end to approximately 2'-1" above grade at the north end. The foundation consists of piers constructed either of fieldstone or of concrete block leftover from the construction of other buildings on-site, such as the Cotton Gin. The piers measure approximately 12" x 24" (Figure D-1). On top of the piers are random sized shim boards and 6" x 6" wood sills with a 6" x 6" girt located at midspan. The floor joists are 2" x 8" spaced approximately 24" on center. All of these pieces of wood are exhibiting various stages of rot and termite infestation.



Figure D-1: Concrete block pier

The crawl space has been encapsulated with wood planks on all but the north elevation. There is a multitude of leaves, dirt and other plant-life that rests against the wood planking, allowing extensive termite damage on the bottom siding of the entire perimeter of the building. Additionally, there are many items being stored beneath the building, such as boxed wooden casings, cedar logs, and other miscellaneous materials (Figure D-2).

Seed House, Main Building, Walls

The exterior siding is circularly sawn, flush boards, varying in width from 7" to 11 3/4" wide. The boards are approximately 1-1/8" thick. The wider boards are installed at the bottom and successive boards become narrower as they are installed closer to the gable peak.

On the north wall, there is a flush vertical plank door with three strap hinges and a manual, rotating clasp (Figure D-2). There is visible evidence of plant growth in the form of vines extending from the base of the walls to the peak of the gable, and there is also evidence of lichen, mold and mildew growing on the walls. A 6" wide bargeboard with chamfered ends runs along the steep gable. There is no chinking material of any kind between the butt-jointed planks and there are significant gaps existing between the siding boards; these gaps would have been intentional to allow ventilation to the mounds of cotton seeds. There is a hole of approximately 14" x 15" diameter that exists where a piece of duct once connected the Cotton Gin to the Seed House, and a small piece of sheet metal protecting this opening remains. The building is currently unpainted, probably the original treatment.

On the east wall, there is a long hatch mounted with two strap hinges (Figure D-3). There is also an entry door that swings inward; however there is evidence (two old strap hinges) of a prior door that swung outward. The entry door is constructed of vertical wood planks with a simple three-piece wooden door frame. There is a set of simply constructed wooden entry steps having five risers and flat wooden boards serving as handrails. The east wall seems to have been covered with the porch roof for most of its existence and is in better condition than the rest of the structure, which has been exposed to the elements.

On the west wall, the plant-growth on the building is significant and the vines have grown into the boxed soffit and have compromised the integrity of the construction (Figure D-4). There is evidence that a door existed previously on this elevation, but has been filled with wood siding to match the remaining exterior walls.

On the south wall, there has been an addition tied into the main building and like the east wall, the majority of this wall has been concealed from the elements and is in good condition. The gable, however, has been continuously exposed to the elements and is in the same condition as the rest of the exposed walls.



Figure D-2: North elevation of the Seed House; open foundation with items stored underneath and evidence of plant-growth on the right side



Figure D-3: Hatch mounted with two strap hinges on the east facade

Seed House, Shed Roof Addition, Walls

A three-sided addition is attached to the south end wall. On all three sides, there is significant deterioration of the bottom three rows of siding boards resulting from insect infestations, plant growth and rising damp. All of the boards show signs of deterioration from the elements and have significant gaps between the boards. In some cases, an attempt has been made to seal the larger gaps with a metal plate secured on the inside face of the walls.

Roof

The roof of the main structure is a steeply pitched, gabled, five-V metal roof (Figure D-5). The ends of the rafters extend beyond the face of the exterior walls and are enclosed with a small, boxed soffit that is in poor condition. The gable ends are faced with bargeboards extending the length of the slope and are chamfered at the ends to align with the soffits. The two shed roofs are single sloping, shallowly pitched metal roofs.

The porch roof is supported on one side by three single 4" x 4" posts, approximately 8'-0" tall,



Figure D-4: Plant-growth on the west facade of the seed house



Figure D-5: Steeply pitched gabled metal roof on the main building and shed metal roofs for the porch and additions

center, with beams resting across them, supporting roof rafters. A wood ledger is attached to the east elevation of the main structure supporting the other end of the rafters. One of the beams installed across the top of the porch posts is showing evidence of significant deflection, most likely from a combination of weather and bending stress. The roof rafters are exposed but appear to have been recently replaced in their entirety with pressure treated wood.

The shed roof on the building addition is a rusted metal roof and is set on unevenly spaced rafters that are exposed to the interior of the structure. The north ends of the rafter boards rest on a ledger board that was once attached to the exterior face of the south end wall of the main building. The rafters extend from the ledger board to just beyond the face of the new south addition exterior wall. The rafter ends are exposed to the exterior elements and their ends are showing signs of weathering. Additionally, the rafters are now pulling loose of their connections at the ledger board. Where this occurs, the shed addition is pulling loose from the main building wall and a large gap has been created between the main building and the addition, allowing a significant amount of water infiltration into both sections of the building.

Interiors

Seed House, Main Building

The main building is constructed entirely of wood framing, using a platform-type frame, with the exception that the vertical jamb



Figure D-6: Seed House, main building interior

supports at the door openings extend below the floor structure to the sill beam. The structural wall framing is constructed of 2" x 4" studs with 4" x 4" posts used for the jamb supports. The wall framing is typically spaced at 24" on center; however, the south end wall supports are spaced more closely at 12" on center, (which may be to assist in support of the ledger attached to the exterior to support the later constructed shed roof addition). The structural wall studs in general seem to be in good condition. There is some minor bowing in the top and bottom plates along the east and west elevations, most likely occurring from the lack of proper support occurring from the disintegration of the sill. There are horizontal wood bands/braces on the bottom third of the wall and their purpose appears to be for blocking upon which to hang tools, as opposed to serving any real structural support. The floorboards are cupping in numerous locations. The ceiling is exposed and steeply pitched, formed by roof rafters spaced at approximately 24" on center which meet in the gable peak of the building and are braced with a collar beam member at mid-span, by ceiling joists at the base, and by the top plates of the wall. There are also some vertical support members resting on the bottom horizontal framing member, extending to the gable peak. There is spaced lath above the roof rafters supporting a metal roof. Some of the rafters have intact collar ties and vertical bracing members; however, there is evidence remaining of many that have rotted away.



Figure D-7: Seed House, addition interior

Seed House, Shed Roof Addition

The shed is constructed entirely of wood framing, using a platform-type, braced frame. The interior 2"x 4" wall studs vary in spacing between 22" to 24" on center and have diagonal bracing in the corners. There is no interior finished wall surface and the wall structure is exposed to view. The flooring appears to be collapsed and significantly deteriorated, with very little interior floorboards visible. The amount of materials stored within the space makes it difficult to determine how much of the wood flooring actually remains. It appears that it may only be the perimeter boards upon which the exterior walls rest that are still in existence. The ceiling rafters rest on a ledger board attached to what was once the exterior wall of the main structure and extend across one centrally located beam to the south exterior wall. The ceiling rafters are spaced roughly at 24" on center and measure 2-1/8" wide by 3-3/8" tall.

For all of the interiors, there is no interior wall sheathing or surface of any kind. The structural wall-framing members appear to have been exposed since their initial

construction. There is significant moisture retention within the building for numerous reasons, contributing to the continued deterioration of the wood structure.

Recommendations

A general cleaning and removal of debris and miscellaneous materials is recommended first in order to assess the condition of the areas not visible. This includes removal of the materials and debris from beneath the addition. The congestion beneath the building prohibits the free flow of air, contributing to structure. Additionally, a portion of the crawl space on the east façade has been closed off flow of air. These boards should be removed and the crawl space restored to an open space.

The ground surrounding the perimeter of the seed house should be cleared of leaves, debris and vegetation. While the general slope of the property grade at the Seed House is from south to north and it appears that the grade is such that it could carry water away from the building, the build-up of natural debris is preventing the slope from working in the manner intended.

The piers should be verified for stability and repairs made as necessary prior to replacing the wood structure resting on them.

The rotted shims and wood sill should be removed. It is recommended that the shims not be replaced so as to minimize the layers of wood and the joints that will be susceptible to moisture and insects and to replace the sill with pressure treated material. Although this pressure treated lumber will not be historic in nature, it will prevent the rot and insects from readily re-occurring. The new sill will be largely unseen, as it will be hidden beneath the lowest siding board.

All ivy and additional vegetative growth should be removed from the building siding. The plant material, fungal growth and general dirt should be removed from the entire building by using a gentle cleanser, such as Prosoco's light duty restoration cleaner and a soft bristled brush. In locations where boards are no longer serving their proper function of sealing the exterior of the building, whether from vegetative infiltration, insect infestation, or general deterioration, the boards should be removed and replaced.

The ledger beam that serves as the support for the roof rafters for the Seed House shed roof addition should be replaced with the same cut of wood and should be securely attached to the building.

building and from the shed roof the moisture retention within the with boards, further restricting the

The missing pieces of the rafters should be re-installed, using the same cut of wood as that used in the original building construction.

Given the state of deterioration present on the addition, it is recommended that the addition be completely dismantled and only the salvageable boards and framing members be re-used during reconstruction. Pressure treated lumber should be used for the sill and new boards should be used for the remainder of the reconstruction, using the same cut of wood as that used in the original building construction.

The roof has surpassed its usable life span and should be replaced in its entirety with a galvanized five-V metal roof, similar to the existing one. It appears that the existing roof was left unpainted, but additional research should be done to verify that this is the case to allow the finish material and color to be replicated if it was painted. If funds are not immediately available to replace the roof, the existing roof should be broom cleaned of debris and loose materials. A new ridge cap should be installed that is constructed of the same material as the existing roof, as this is the source of a significant amount of the water infiltration into the building. The balance of the roof should be inspected for loose or missing nails and for holes, and all necessary remedial work performed to make the existing roof as watertight as possible until funds are available to replace the roof. This remedial work includes installing flashing as necessary between the shed roof addition and the main building to insure that a watertight connection exists between the two buildings.

Regarding the flooring, it is suggested that the flooring for the Seed House remain in its current condition, but that the flooring for the addition be replaced with flooring boards of the same cut of wood as those that were installed originally. If funds are not available for this, the flooring area should be cleaned out as much as possible to eliminate safety hazards and a set of temporary steps with a handrail should be installed that is constructed of new wood materials to provide access to the inside of the space for viewing the area safely.

It is recommended that the entire structure be inspected and treated as necessary for insects by a licensed professional to avoid any future damage. Periodic inspections for insects should be incorporated into an ongoing preventative maintenance plan.

Figure D-8: The Seed House Floor Plan

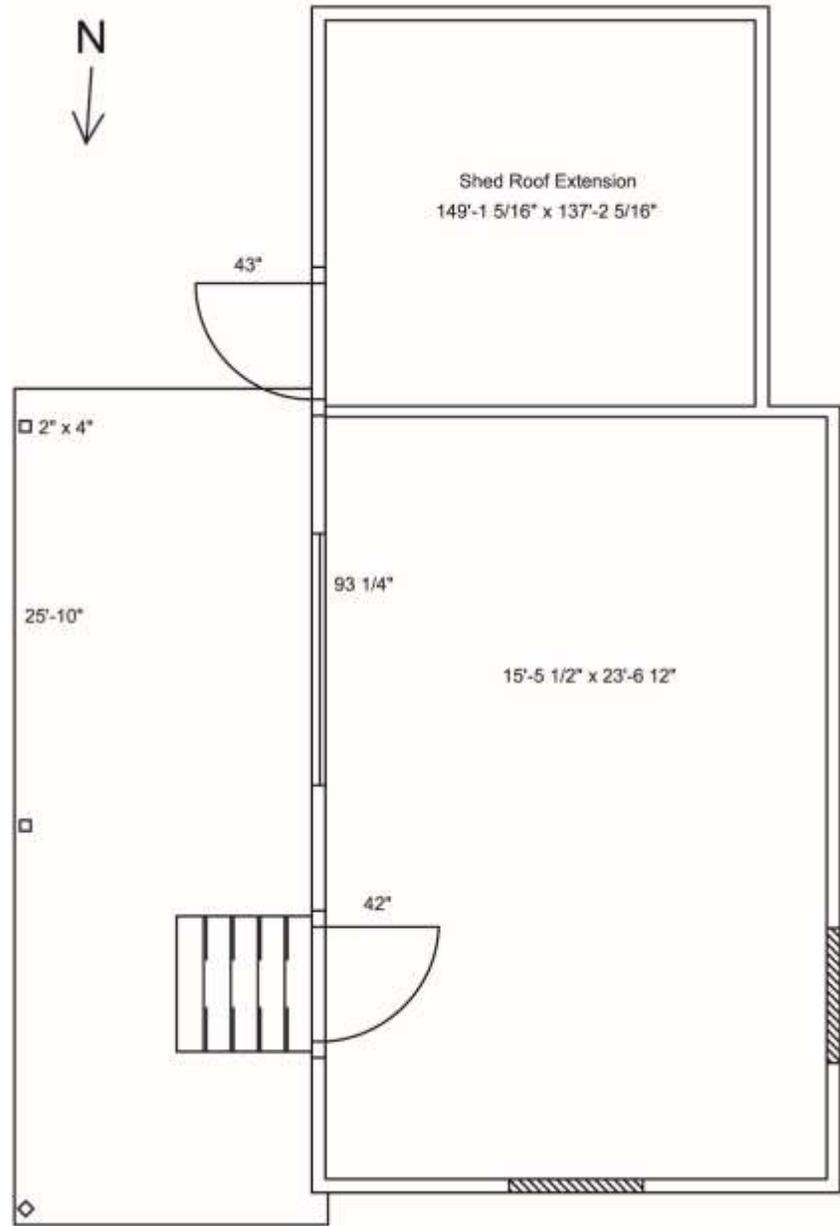
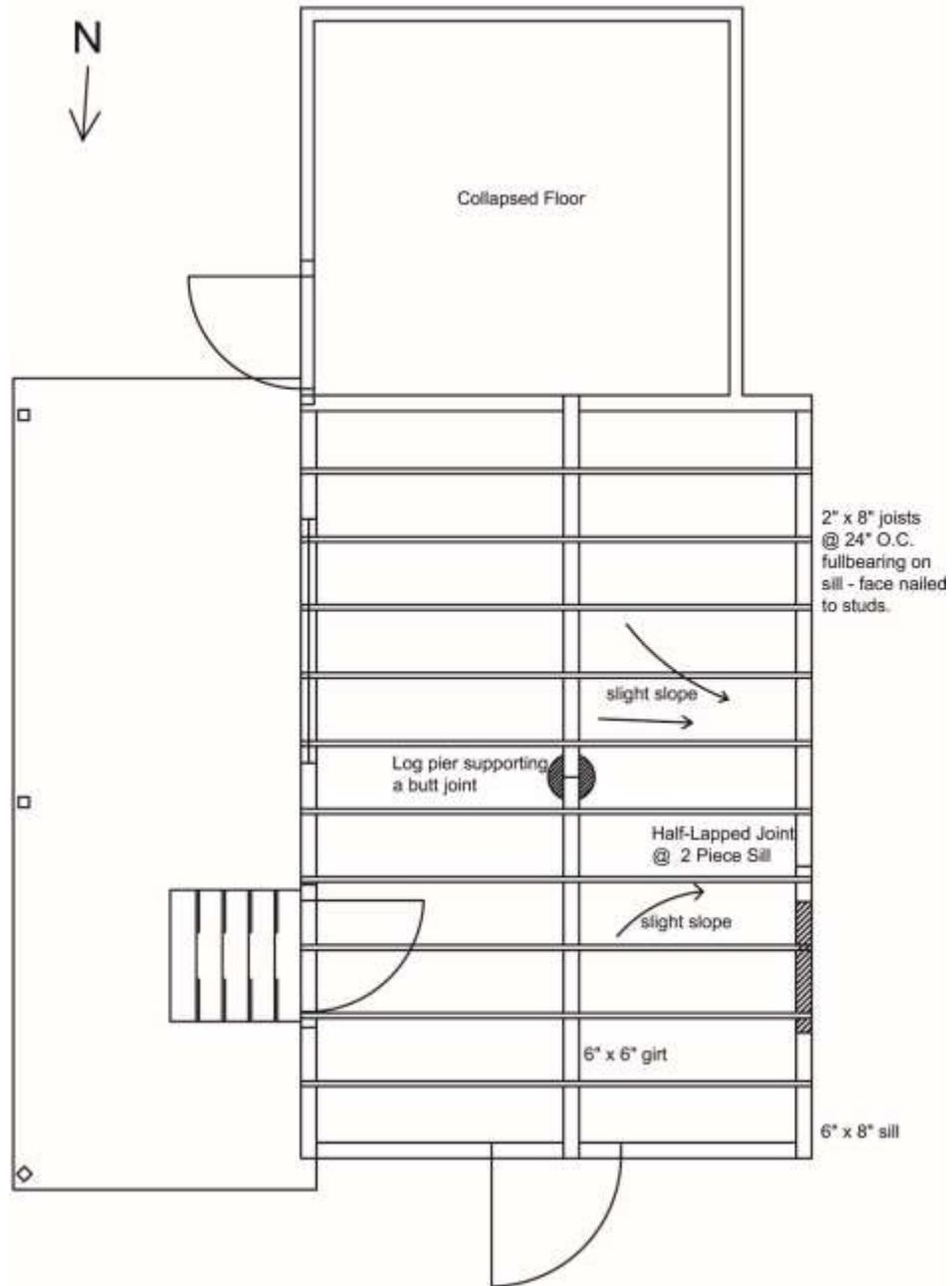


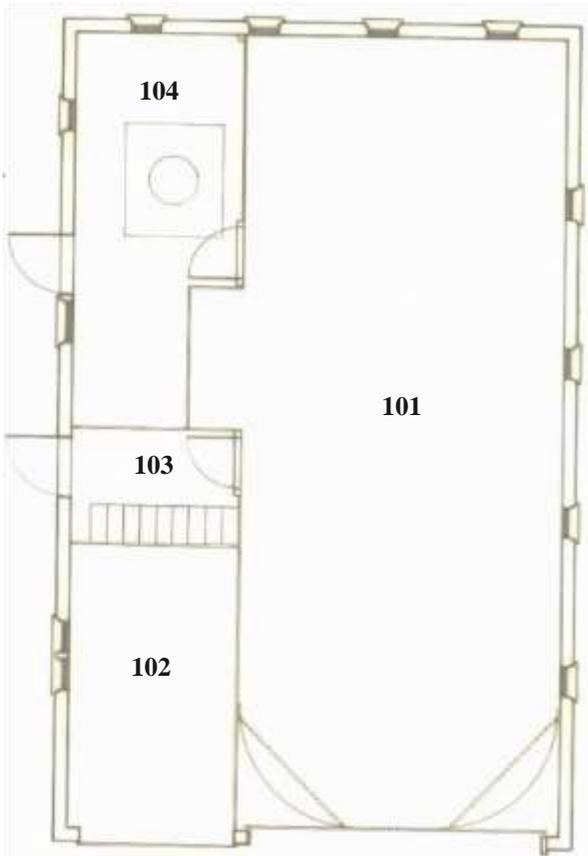
Figure D-9: The Seed House Section (Looking South)



e. the garage



Chronology of Development and Use



Garage Floor Plan showing main room (101), paint shop (102), hallway and stairs to attic (103), and pump room (104).

The Garage was constructed in 1923 for the purpose of providing a sheltered area to repair and paint vehicles being used by the farm operation, as well as the Ethridge family. Additionally, penciled notations on a log posted on the wall of the Pump Room (103 on floor plan), indicates repairs were also facilitated for people other than those of the Ethridge family, most likely extended family and neighbors.

The manufacture of concrete blocks by the Ethridge Family has been discussed above with the Cotton Gin. While the concrete block used for the construction of the Garage was not made using the patented process, the verification of the patent origin, the references to Ira Ethridge's older brother's concrete business, as well as Stallings' references to Ira Ethridge himself having entered the concrete business for a short time strongly indicate that all concrete block products used at Shields-Ethridge Farm were produced by Ethridge industries, most likely at the still extant concrete plant in downtown Jefferson, Georgia.

The Pump Room (room 104) shows the greatest modification over the building's 86year history with a 30" square concrete slab hosting an 18" diameter hole that once was a well for the farm. Tanks once used for spraying automobile paint sit discarded in the room indicating a use that no longer is viable for the operation.

The Paint Shop (room 102) was where vehicle parts and farm equipment received fresh coats of paint in as dust-free an environment as can be expected in a 1923 building that has not experienced upgrades since Ethridge's 1945 death. Sheets of polyurethane draping the interior of the Paint Shop and shielding a large metal frame holding pieces of a recently painted vehicle body indicate the Paint Shop is still in use. Ethridge's granddaughter, Susan Ethridge Chaisson, explained that the family has plans to restore a couple of farm vehicles and has been using the garage for parts storage. This is verified by a photo of a 1952 Ford pickup truck and the frame of another smaller vehicle both pulled into Garage room 101, once the vehicle housing and repair facility (Figures E-1 and E-2). According to Chaisson, the water pump in room 104 is still operational as evidenced by a garden hose attached to the pump and stretched through the pump room door outside to the south of the Garage.

Existing Conditions



Figure E-1: Last driven in the 1980s, this 1952 Ford truck patiently awaits restoration.



Figure E-2: A small vehicle frame is in the process of being restored.

The concrete block garage at Shields-Ethridge Heritage Farm is one of the more recent constructions on the property having been built in 1923 with hollow plain-faced concrete block. The east-facing garage is situated about fifteen feet from Ethridge Road on a flat section of land. The site is predominantly level with minute irregularities in the terrain.

The roof is a hipped style with a dominant east-facing gable. Constructed of galvanized steel five-V-crimp sheet metal, the roofing material is composed of two horizontally overlapping courses of 24" wide metal sheets with a roof ridge cap. The 86-year-old roof has weathered the elements well and shows very few minor breaches. Nailed to spaced wood lath, the alternating overlapped seams form the junction of adjacent sheets on each 6/12 slope. Barn red paint has protected the metal surface.

A vernacular saw tooth pattern of wood shingles decorates the front-facing gable, framing the lone 4/4 double hung sash window. Five wooden triangular knee braces set into the 6" wide bargeboard offer support to the 21" deep roof overhang and are evenly spaced with two at each end of the roof, two positioned mid-slope and one at the gable point.

Three vertical plank doors form the main entries to the Main Garage (room 101) and Paint Shop (102). The 91" x 95.5" double doors to 101 are constructed of 8" – 9" wide wooden planking across which are nailed on the inside six 6" - 8" horizontal cross boards. The doors are suspended from a pair of Myers barn door tracks to which is attached on the inside two Myers Stayon Adjustable barn door trolleys, one at either end of the door. One trolley is suspended from the track mounted above the doors while the other is attached to the adjacent wall. The opposing doors open in a pivoting style when pushed away from the center and hang parallel to the interior walls on either side of 101.

The third entry door leads to the Paint Shop (102) and, at 93.25" wide, is slightly larger than the two 101 doors. Suspended from a



single Myers barn door track mounted above the exterior of the door opening, this door slides to the right of the visitor entering room 102. Myers Stayon Adjustable Barn Door Trolleys appeared on the United States market in 1888 and continued to be in use when the 1916 Farm Implement Catalog was published. Simple swivel locks used with padlocks provide the only locking security for the Garage.

The Garage has had two electrical systems: one when the building was constructed and one more recent though no definitive dates are available for that update. The vintage lighting was provided through the use of white porcelain wall or ceiling mounted sockets with the exposed wiring supported throughout the building by wall or ceiling mounted porcelain insulators. The updated system is side-by-side with the original.

Moving from the east entrance counterclockwise around the garage, the north elevation of the Garage is composed of ten courses of hollow 23" x 9" x 8" smoothfaced concrete block laid in a typical block stretcher bond pattern with mortar joinery. The concrete block wall is set atop a poured concrete foundation that was site-formed. The foundation extends 2" beyond the concrete courses on the interior and exterior of the walls and has a hand-formed water table creating a 45° angle directing away from the foundation. Four 4/4 double hung wooden sash windows are evenly placed between the second and ninth courses of block. Exposed rafters overhang the exterior walls giving a 21" protective awning to the surfaces below.

On the west elevation, three 4/4 wooden double hung sash windows placed between the second and ninth block courses are the only openings. Two windows serve room 101 while the third opens to room 104, the Pump Room.

The south elevation has the only access that can be used by visitors without opening



Figure E-3: Interior view

the main doors on the east side. A wooden vertical plank passage door is set at the first masonry course one foot above grade and above the foundation. The door swings outward and opens into the pump room. The only 6/6 wooden double hung sash window on the building shares the east side framing for the Pump Room door and opens to the ell inside. A 4/4 wooden double hung sash window set five feet to the west of the door also serves the Pump Room. At the center of the south façade is the second door, also set one foot above grade atop the foundation. This door opens into the Hallway, which houses the stairs to the attic. A wooden framed transom provides the only natural lighting into the hallway and is the only transom in the building. Six feet to the east of this door is a wooden double 4/4 double hung sash window that serves the Paint Shop (102).

Entering the Main Garage (room 101), the north door slides into place while the south door is prohibited from being moved due to several large items pushed against the center interior wall. The garage floor is a rough, irregularly poured concrete slab with a 15” – 24” packed dirt perimeter around the room.

The windows are topped with concrete lintels effectively distributing weight from the roof around the windows to the foundation and ground below. Darker grey mortar less-than-neatly applied offers evidence of some repointing using a Portland-based material. Block faces on the interior are rough in contrast to the smooth exterior concrete block surfaces.

Examination of the foundation reveals some spalling (surface has been “skinned” leaving the softer interior of the concrete exposed to the elements) on the northeast end near the right hand garage door. Spalling could have been created when the door struck the wall while being opened or closed since the Myers trolleys and tracks do not appear to have had any maintenance in some time and are rather difficult to move.

The ceiling’s pine board and batten pattern runs east-to-west and is in amazingly good condition. The ceiling’s condition shows some indication of white rot caused from moisture, probably from roof leakage, though no point of origination could be determined. At some point, the ceiling will need to be addressed through treatment and replacement of the ceiling material. On the south wall of room 101, some scorching of the wall material indicates that a small fire may have taken place near the wall causing the blackening of the wood.

The interior wall continues the pine board and batten pattern that is used on all the interior walls. Between the hallway door (room 101) and the Pump Room (room 104), there is a small alcove that could have once been a storage area for larger vehicle parts or even

have had shelving at one time for storage though the only indicator of any sort of storage is a 4 x 4 post hanging parallel to the floor about four feet above a raised



**provide additional support for
hipped allcommon rafter
system**

platform six inches above the floor. Between the Pump Room door and the west wall, a wooden worktable built next to the wall holds assorted items.

The Pump Room (104) floor is primarily dirt with partial poured concrete. In the pump area at the west corner, a 2'x2' concrete slab houses the 18" diameter hole that leads to the well. Several flat metal slats are positioned above the hole in an effort to prevent someone falling into the open hole. Two paint tanks with attached gauges are pushed to the west corner of the room and are no longer functional. A third more modern tank stands in the center of the room and appears to be operational. A garden hose is attached to the electric well pump located on the

floor of the pump room with the hose extended out the south façade. Shaped in an ell, the rest of the room houses the voltage regulator for the electric fence and a vintage white porcelain double light socket with two glass fuses attached on the north wall. A number of discarded items litter the floor, shelves and furniture.

The Pump Room's exterior door hardware is located on the interior of the door. The 6" strap hinges have rusted, but are still solid and operational. There is no mechanical lock installed on the door; it is chained closed with a padlock on the outside.

Between the Pump Room (104) and the Paint Room (102) lies the Hall (103) accessible from the south exterior or from the Main Garage (101). A narrow passage, the five-foot width has a flight of 18" wide stairs leading to the full-size attic. The open staircase stretches above recessed shelving built into the walls beneath the stairs. The shelves hold hundreds of empty soft drink bottles. Also in the hallway is a hanging cabinet 30" in height, six feet in length and at a depth of 8" with sliding screen doors. Three shelves inside the cabinet hold assorted odds and ends of canned and boxed items, as well as some glassware. The walls and ceiling of the hallway are pine board and batten. The doors are vertical planks nailed to horizontal plank members on the inside. The interior door has a wooden block on a nail that swivels to hold the door closed. There is no mechanical lock on the exterior door, but it has been padlocked closed.

The attic is presently being

used for storage of items ranging from a 1930s Ford pickup truck grille to pieces of furniture to a wheat thresher. A single 4/4 wooden double hung sash window provides natural light to the attic that is also electrified.

The roof system for the building is the traditional hipped all-common 16" spaced rafter system of 2"x 6" planks with queen posts (also of 2"x 6" boards) providing additional support (Figure E-4). The attic floor is wooden tongue and groove and is continuous throughout the attic over to the queen posts where open floor joists extend to the exterior walls of the building. The spaced lath supporting the sheet metal roof is visible as is the roof itself. On the east end of the roof, the spaced lath becomes a plank sheath extending from 18" inside the building to 21 inches outside.

Condition Assessment

Overall, the garage is in good condition. One compromised rafter (#4 from the northeast end of the attic, Figures E-5 and E-6) is the only real structural concern. Some tension cracking (see more explanation below) evident on the north façade indicates the building has endured settlement shifts, but does not show signs of recent activity.

Walls/Foundation

The surface of the garage foundation is mortar applied over what appears to be the original poured concrete foundation course extending the base of the garage footprint two inches (2") beyond the walls' surface. The concrete walls are constructed of ten courses of 23-1/2" x 8" plain-faced hollow concrete blocks.

Damage from moisture or mechanical sources is minor, but should be monitored. Several areas of spalling (surface material has deteriorated leaving a "skinned" appearance revealing the inside of the block) most likely caused by moisture are evident on the north, west, and south facades. Mechanical damage on the bottommost block on the south façade west door exposing the inside of one block confirms this assessment of the blocks' composition. Additional mechanical damage around the foundation also reveals the intact aggregate inside the damaged block.



Figure E-5: Rafter #4 in the northeast corner of the attic will need stabilization and repair



Figure E-6: Closer view of northeast Interior Rafter #4-white rot damage

On the north façade,

window #1 (from northeast corner) has mortar line cracking from the top stretcher course and continuing through the second course of block, through the mortar and through the foundation. The crack is less than 1/4" in width indicating moderate damage.

The south façade foundation shows evidence of having been repaired during its history. The interior foundation of the Paint Shop (102) is concrete poured over rubble leaving a rough interior face as opposed to the smooth finish throughout the rest of the building. On the exterior, the foundation from the

Hallway door to the ESE corner appears to have been coated with a Portland-based mortar. The rest of the building on the south side does not appear to have been damaged, but moisture from recent rains (October, 2009) may indicate a water drainage issue. Additionally, red clay stain from splash back is evident on the south and west foundations indicating that moisture exposure over a prolonged period of time could have caused some deterioration in the foundation.

Settlement cracks are evident on the north and west elevations. These are moderate cracks most likely caused by the building settling during its normal course of history. The cracking was also likely to occur when the ground becomes too wet for long periods of time following heavy rains. The evidence of moss growth around and on the foundation indicates a need for a water drainage system that will allow the water to drain away from the building, but not detract from its historic appearance.

Roof

The painted tin roof is in excellent condition for an 86-year-old roof. Minor breaches in the seams where the roof layers overlap, as well as along the west hip, are allowing moisture from rain and the occasional snow, frost or ice to gain access to the wooden roof rafter system causing slight damage inside. The roofing material is attached by way of spaced lath nailed to the roof rafter system. An occasional nail has worked its way out of its hole with only one nail hole spotted that could be the source for some minor leaking during heavy rains.

Rafter System

Rafters are nailed together at the top edge without benefit of a ridge board or mortise-and-tenon joints. Collar ties nailed to each set of rafters stabilize the structure, along with the plank lath nailed to the rafters. The aforementioned rafter #4 from the NE corner of the garage is broken through, apparently from rot caused by water damage, possibly from the nail hole in the roof nearby, but no clear evidence points to that being the water source.

Floors

A poured concrete floor in Room 101 of the garage does not reach the walls of the room stopping approximately eighteen inches from the edges and providing a water resistant surface for the stored vehicle or other items stored in the building. Rooms 102, 103, and 104 are all dirt floored.

In the attic, a tongue and groove floor nailed to joists beneath provides a sturdy surface. The last two visits to this site were November 13 and 19, 2009, just after heavy rains in the area. There was evidence of some leaking in the northeast corner of the attic (Figure E-7) as seen in the photograph. The leak could be from a single nail hole in the roof where it appears a nail has worked its way out of the sheet metal roof.

Doors

The north pivoting garage doorframe has rot damage at the bottom indicating long-term water exposure. The suspended garage doors hang less than 2" above grade encouraging more exposure to moisture. The exterior hallway door has experienced some water damage to the bottom edge causing some deterioration. As shown in Figure E-3, the door is not weather tight allowing moisture and temperature extremes more ready access to the Garage and its contents. The exterior doors have rather large gaps where they should close, but do not.



Figure E-7: Attic floor of 2" planks; red area indicates dampness from earlier rains.

Windows

Glazing is virtually non-existent on most of the window exteriors with only partially driven finish nails securing the panes into the frames. An occasional windowpane is missing. There is no apparent record of a window replacement effort in the Garage's history. With the framing for most of the windows provided by the concrete opening, gaps exist where windows were not properly installed or the building has shifted causing the windows to shift, as well. On the interior, window lintels are more evident due to being finished differently, but do not appear to be replacements. No window hardware is present; bottom sashes are operational and can be easily opened.

Evidence of there having been a powder post beetle infestation at one time is present on a couple of the window sashes, but does not seem to have created anything but minor damage. There is no evidence of an active infestation.

Interior walls/rafters

Evidence of water leaks in the center ceiling of the Main Garage (101) is indicated by the presence of white rot and some surface deterioration. Several areas of white rot are also present on rafters in the attic, along with tan colored blotches also indicating fungal growth in the attic on rafters, as well as behind the interior door in the hallway.

Terrain

High moisture content in the ground adjacent to the garage is apparent through the growth of moss on the ground and creeping onto the building's foundation on the north,

west, and south elevations. Lichens are also growing in intermittent spots on the foundation's exterior.

Historic Preservation Objectives

For the purpose of Shields-Ethridge Heritage Farm's future as an agricultural museum, stabilization, repair and restoration for public access will be important not only to preserve the integrity and historic fabric of the buildings, but also to prevent further deterioration from insect and water damage.

Extraneous objects discarded and stored throughout the Garage needs to be sorted and

dispatched either to another storage facility for items not related to the preservation effort or permanently discarded. A large quantity of items in the Main Garage (101) prohibits a complete evaluation of the building, but since the building is not constructed on a substructure, the likelihood of any hidden structural compromise is unlikely.

Work Recommendations and Priorities

Wall/foundation cracks, rot/fungal growth, and the compromised rafter are the targets for attention with the rafter being the most critical as it has the potential to cause the most damage.

Roof

The roof is in good condition with very few breaches, as discussed previously. There is no evidence of rust. The only compromise appears to be a nail hole on the northeast slope near Rafter #4 (inside) that may be allowing water to enter the roof and could have caused the white rot damage that has compromised the rafter. Heavy rains with high winds can allow water to enter the attic through the inherent overlaps in the sheet metal roofing material. With the only damage in 86 years being rafter #4, it is recommended that repairing the nail hole with an in-kind patch soldered in place will be sufficient until such time as the roof needs a total replacement. If other metal roofs on the property are being replaced at some point, it may be less expensive for the Foundation to replace multiple roofs at the same time and to include the Garage at that time.

Rafter System

Rafter #4 is discussed in Part 2 under “Rafter System.” Though the rafter is being held in place by virtue of the many nails driven in it for the roof installation, it is completely broken. Fortunately, that section of the rafter is being assisted by rafters on either side, as well as by the intact portion of the rafter.

An immediate repair utilizing a “sistering” technique would allow for a minimum

disturbance of the roof system, stabilize the rafter, and provide uniform support for the northeast corner of the Garage roof. Sistering the rafter is accomplished by “sandwiching” the damaged portion of the rafter between two like-sized boards and screwing them into place. This will stabilize the rafter and return the support capability to the structural member without having to replace the entire rafter until such time as the roof must be replaced allowing better access to the rafter without the roof weight bearing down on the rest of the roof system.

Wall/Foundation

The wall/foundation cracks should be monitored over the next few years. The only area for concern is the northeast façade where cracking has taken place through one block of course #2 and the foundation, as well as through the mortar joints. The cracking appears to be old and is most likely the result of building settlement, causing tension in the wall since the garage is built directly atop the ground.

The best action to take is to stabilize the cracks and repair them by using an epoxy inserted into the foundation and cracked block to fill and cement the breaches. Repointing the mortar joints around the building wherever the mortar has cracked is recommended. Portland-based mortar (with at least some lime) has been used for previous repairs and would be appropriate for these repairs, as well. Otherwise, the mortar used for the construction of the Garage has weathered well and is mostly intact. However, mortar is a sacrificial material and intended to be replaced about every fifty years. If additional cracking is evidenced, an overall repointing is recommended.

To promote a drier environment around the Garage foundation and, hence, lessen

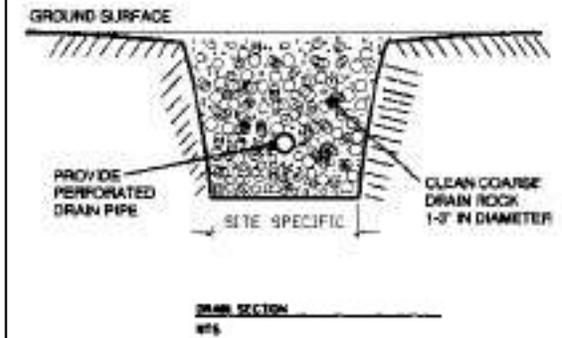


Figure E-8: Recommended Drainage around Garage

the likelihood of building settlement or shifting due to moisture in the grade, it is recommended that a water drainage system be installed around the perimeter of the building. The installation of a French drain, for example, and filling with gravel to allow for better drainage and absorption of rain water from the roof will help the area to drain faster following heavy rains. Due to the terrain and the Garage's proximity to the roadway, it is recommended that the drainage system outlet be located beyond the southwest corner of the building between the Mule Barn and Wheat House allowing sufficient room for the water to be absorbed into the ground without any danger of compromise to the other two buildings.

Water Damage

Water damage is a chief cause of deterioration not only in wood, but also in masonry and metal. To address the white rot conditions, the damaged wood needs to be removed, the remaining wood treated to prevent the spread of the fungus, and any subsequent repairs made to secure the wood.

Around the foundation of the Garage, cleaning moss and fungus from the masonry surfaces and immediate ground area will help deter the growth of plants that will attack and deteriorate the surfaces. Additionally, repairing or replacing with like materials the concrete water tables and window sills will assist with rerouting water from around wood members and into mortars.

Concrete Block

While concrete block has proven to be an excellent building material at ShieldsEthridge Heritage Farm, its longevity will be increased by addressing areas of spalling on the walls and foundation of the Garage. The National Park Service in its 2007 Preservation Brief 17 "Preservation of Historic Concrete" by Paul Gaudette and Deborah Slaton (Gaudette & Slaton, 2007) offers sound how-to recommendations for concrete repairs, the materials and procedures to implement and how to care for historic concrete structures.

Windows

Finally, while the finish nails have held the window panes in place for some time, it is recommended that having the windows properly glazed and some general maintenance performed – including replacing missing panes – will go a long way toward helping the Garage to last another 86 years.

f. the grist mill

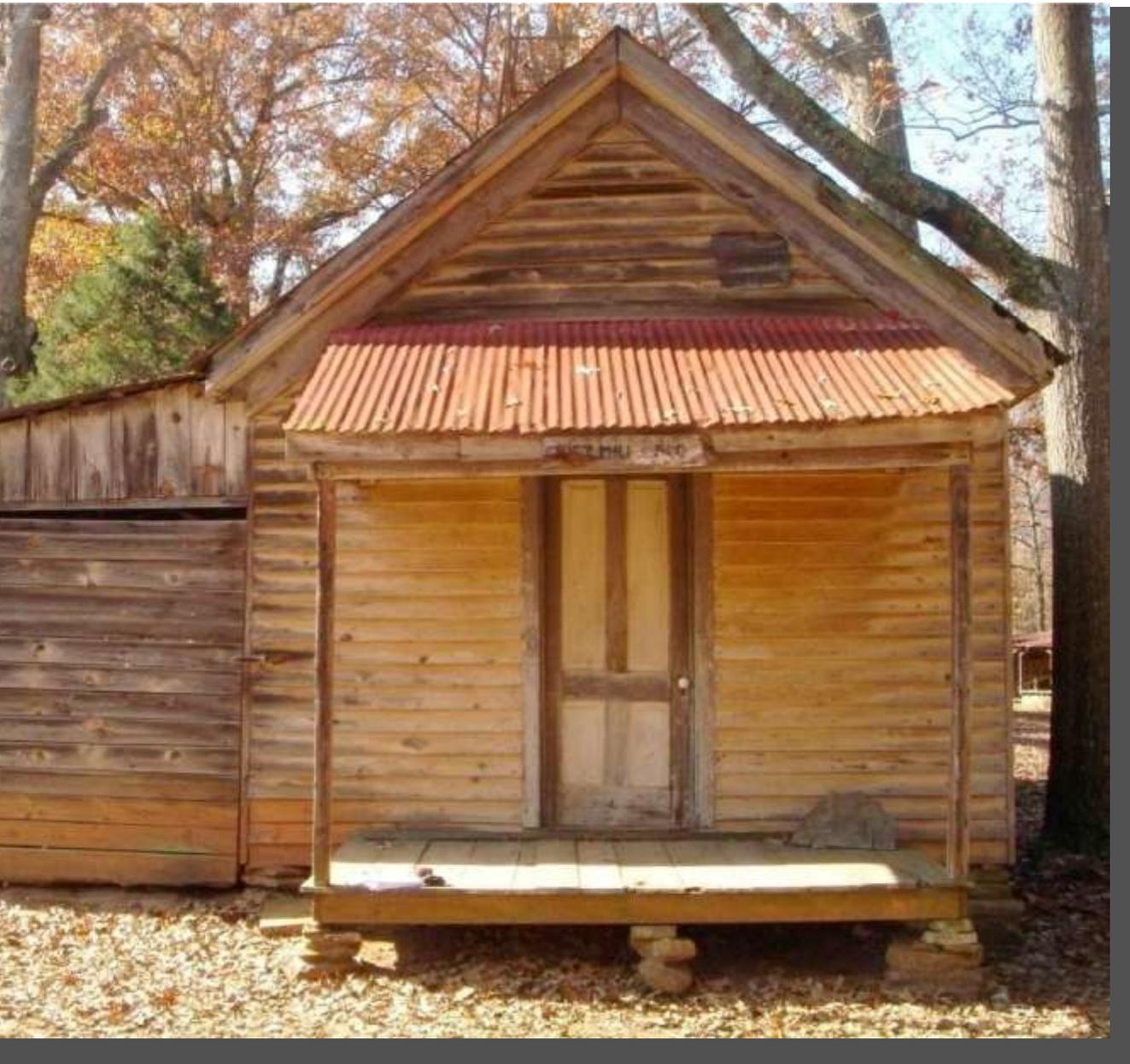




Figure F-1: Floor Plan

Introduction

The grist mill is one of many farm buildings on the Shields-Ethridge Farm situated near the bottom of a slope. Across the street from the main residence of the farm, the grist mill is oriented towards the home and is surrounded by other farm buildings. The grist mill has an overall footprint of about 536 square feet, with only 292 square feet comprising the main, enclosed building. The grist mill is a wood-framed building comprised of two main components: a one story gabled roof section and a one story shed attachment on the south elevation and the west elevation; there is also a one story closet under the west elevation shed roof that is flush with the north elevation, extending 57 ¾ inches along the west elevation, and a covered front porch.

The main section of the building is believed to have been built around 1900 using a braced frame structural system which used nails, unlike earlier types of this framing technique which employed mortise and tenon joints. The shed attachment has open walls except along the east and south elevations which have plank sheathing. It appears that this portion of the shed and the portion off the back of the building were on the grist mill originally because the back portion has vertical boards in the gable flush with the south elevation. This cover would have been necessary to protect the engine powering the belt for the milling operation. The shed along the south elevation of the main structure also houses equipment for the grist mill, and the window on this elevation never had shutters to protect it, suggesting it was already protected by the shed. The shed roof at the back southwestern corner is also constructed using continuous sheathing on the rafters, which is different from the open spaced lath used in the roofing system of the rest of the structure.

The structure was built using circularly sawn lumber and wire nails. The building, like others on the property, was originally covered in whitewash and a darker color wash on the trim.

The main section of the building and two sides of the closet is sheathed in wood clapboard with a 5" reveal, which is damaged by insects and rot. A porch with a shed roof, supported by two 3" x 3" square wood posts, shelters the front door on the east elevation. The entire building bears on stone piers.

384”

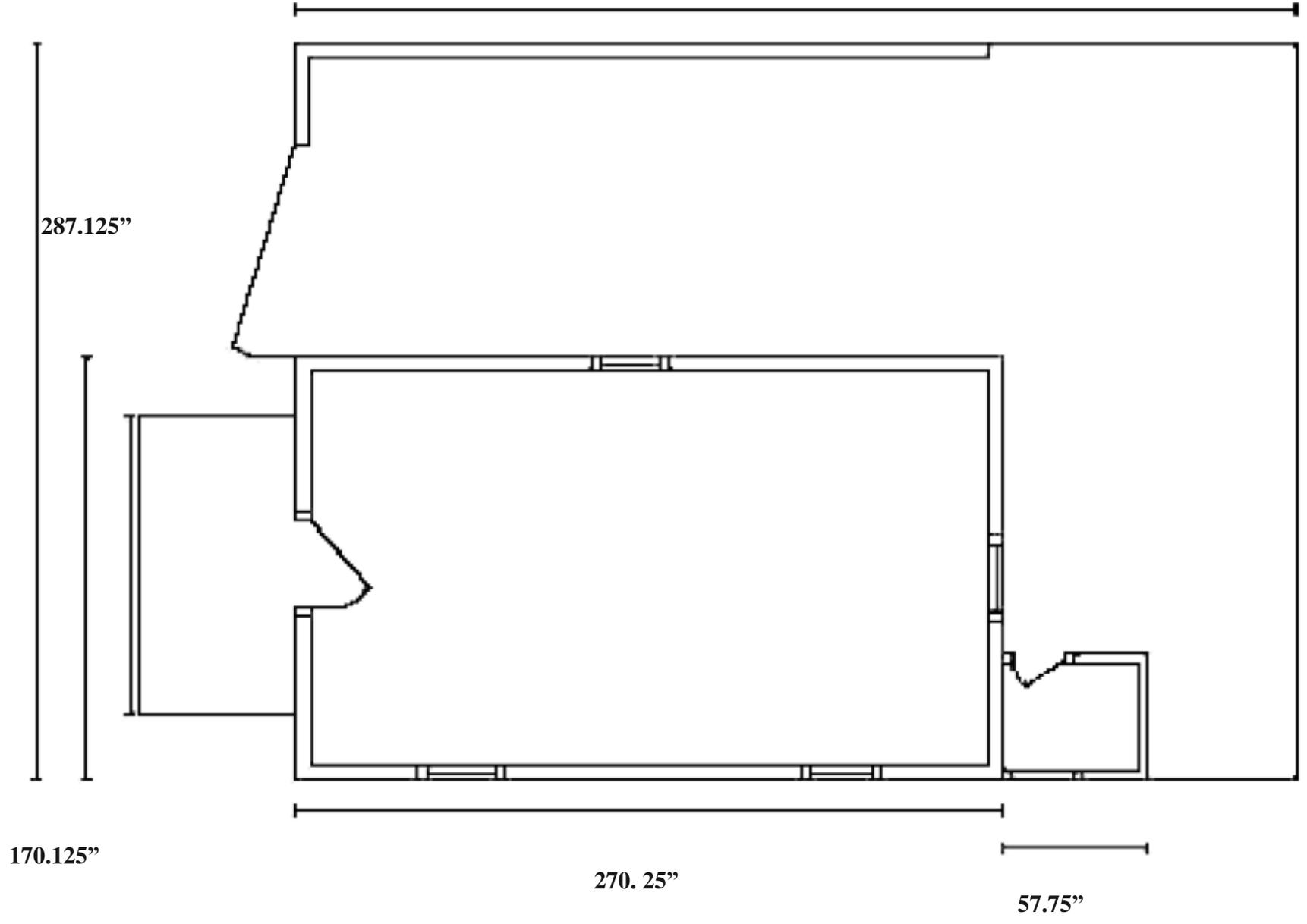


Figure F-2: Measurements



of east elevation on grade

Figure F-4: Rot and termite damage on shed sill

Figure F-5: Field stones support structure
Existing Site Condition

The mill is situated near the top of a rise with its north elevation facing the slope and the southwestern corner facing the high ground. Its site slopes down from the southwest to the northeast, away from the building. Over time the grade has been allowed to build up around the stone piers on the south and west elevations. The grade has risen to such an extent that these elevations are on or below grade, which has

caused damage to multiple portions of the structure: the sill on the shed has been rotted out and eaten by termites, posts have had to be shortened, and sheathing damaged.

Additionally, behind the closet and along the north elevation of the building there are areas which retain water coming off the roof, which has created depressions in the ground which retain moisture.

The grist mill is situated next to two large oak trees which are within two feet of the north elevation, both which have large branches reaching over the building. The south elevation has short mown grass along the side of the shed.

Existing Structural Conditions

Foundations

The grist mill is supported on piers consisting of field stones with clay based mortar joints (Figure F-5). Both of those visible appear to be in good condition. The back of the closet sits on a board that sits directly on the ground and has subsequently rotted.

Floors

The grist mill is framed with 2" x 6" horizontal floor joists in the front two-thirds of the building at 23" on center (Figure F-6). Joist ends are notched at the ends and bear on a 2" x 2" ledger board nailed on the bottom of the sill, which is 6" x 7". The sills are butted together at the corners with the east elevation sill being terminated on the side on the south and north elevation sills. There is cross bridging in the center of the floor joists to prevent the lumber from twisting.

The back third of the floor joists are perpendicular to the front portion and are made of 2 1/2" x 3 1/2" lumber, making this section

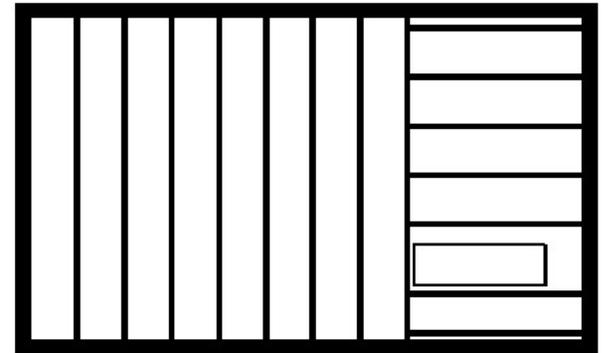


Figure F-6: Flooring Diagram

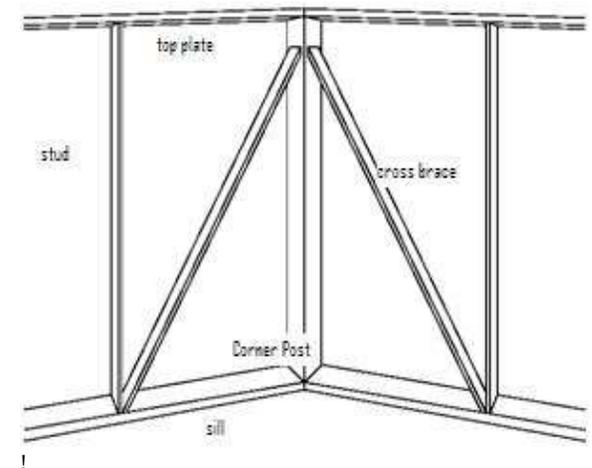


Figure F-7: Wall framing

lower than the rest of the floor by about 3". The joists are 10" on center, but are interrupted by a 55" x 20" concrete block that is 22 1/2" off the north sill. These joists are nailed to the last joist in the front section and to the sill.

The front section of the floor is finished with 3/4" tongue-and-groove boards; the width of these boards is 3 1/4" and 4" in a random pattern. The back section and the closet have 3/4" thick horizontal plank boards. The floor system has noticeable deflection in the northeast corner due to the weight of the grinder. There are also soft spots in the flooring due to leaks in the roofing and a hole in the middle of the floor from termites. Throughout the interior, there are also small holes from powder post beetles.

Roof

The roof is framed with 2" x 4" rafters fastened at the ridge with a butt joint. The rafters are set anywhere between 20" and 27" on center and bear on a false plate that rests on 2" x 4" ceiling joists. The top plates are connected at the corners using a miter joint. The roof structure seems to be in good condition, but roof leaks threaten to damage multiple rafters which, if left unchecked will rapidly deteriorate. Two rafters have been compromised by being cut to allow the milling equipment to be attached to the roof structure. Since the grist mill was built around 1900 and the grinder was manufactured in 1908, it seems that it was added later and needed the roof structure to be reconfigured. They strengthened these rafters by adding a type of knee wall to them. The gables are framed with 2" x 4" studs, the 4" side facing out.

Porch

The front porch rafters are made of 2" x 4 1/2" lumber. The rafters bear on the top plate using a birds mouth joint; the upper ends

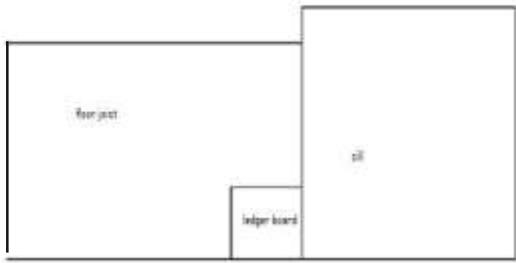


Figure F-8: Floor joists on ledger



Figure F-9: Corrugated Steel Roofing

have been shaped to connect to the side of the building by use of a 2" x 2" ledger board. The 3" x 3" porch posts are notched at the top to receive the top beam. The front porch flooring is in poor condition due to water damage caused by the lack of flashings and separation caused by foundation settling. Multiple rafters and the top beam have carpenter bees in them, but these are not a threat to the integrity of the wood because they are few in number.

The porch floor is framed with 1 ½" x 5½" joists that have a 2" x 8" girt running down the middle, face nailed to the sill. The framing has been replaced and currently has modern pressure treated lumber.

Shed

The shed portion of the structure is supported on wood posts along the perimeter except for the portion on the south elevation. This covered portion is framed on two sides with 4" x 6" studs that are 30" on center, with a 5" x 8" inch sill on the south elevation, which has had a piece replaced. Half of the sill on the south elevation has been replaced by two 2 ½" x 8" boards placed together and connected to the other part of the sill using a half lap joint.

Walls

The interior framing is constructed of 2" x 4" lumber installed approximately 26" on center using braced frame construction (Figure F-7). Originally, this type of framing method used hand joined timber but switched to nails and sawn lumber once their production became massed produced. That is the case with the grist mill, which was built during the time of massed produced sawn lumber and nails at the turn of the century. Braced frame construction used heavy timber posts at the corners with smaller, closely spaced studs in between. These corner posts had cross braces connected to them to provide strength to the walls. This bracing was necessary since no sheathing was used and the clapboard was nailed directly to the studs. Currently, the post on the southeast corner has started to crack and has had to be sistered for unknown reasons.

Existing Exterior Envelope



Figure F-10: North Elevation window and shutter



Figure F-11: Rotted window sill

Roofing

The building is currently protected by a corrugated galvanized steel roof, except for the southwest corner of the shed which has a 5-V crimp metal roof; both types are common throughout the property (Figure F-9). There is a lack of flashings on the building, which has contributed to leaking at connection points. The roof has multiple small holes, both on the main and shed portions of the building; the shed also has more substantial holes from rust. These holes have caused rot in the ceiling joists, false plate and spaced lath. The roofing is attached to spaced and continuous lath on the southwestern shed using nails.

Windows

The windows consist of wood 4 over 4 double-hung sashes, with plain 1 1/2" x 3 3/4" casing on the north elevation (Figure F-10). These two windows have simple board and batten shutters on them; these shutters currently have contemporary metal strap hinges holding them up and are sagging. The window on the south elevation is missing and there is just a screen covering the opening. The dimensions of the opening suggest that it would have had the same size window as on the north elevation. This window does not have any indication, such as nail holes, of ever having shutters like that on the north elevation. The back window differs from the others in a few ways; it is a 6 over 6 double-hung with an extra long sill and an opening below it for the belt from the engine to go through. All windows have sills that are properly sloped to allow water to flow off. The storage closet has a board and batten window on the north elevation which has a 24" by 29" opening. It is attached with contemporary metal hinges and does not close properly from sagging.

The windows and exterior trim on the south elevation and on the west elevation are in good condition, due to being covered by the shed. The windows and trim on the north elevation are not in as good condition and suffer from rot (Figure F-11).

Both windows have extensive dry rot on the sills and on the casing; the rot on the left window is also on the interior portion. The



! **Figure F-12: Main entrance**



! **Figure F-13: Tongue and groove finish on northeast corner**

window frames have gaps between them and the clapboard which has allowed water to penetrate into the structure causing rot on the sill and bottom of the studs under the right window. The right window on the north elevation has one pane missing from the top sash, but all other panes in the building are in good condition. The shutters are not fastened very tightly, which makes it difficult to open and close smoothly.

Doors

There is only one door servicing the main portion of the grist mill and it is a fourpaneled door, put together with cope and stick joints (Figure F-12). A rim lock is used for the main entrance. The door casing, stiles, and rails are painted a dark red color, and the panels are whitewashed. The door is in fair condition with separation occurring between the stiles and panels. It is attached to the frame with strap hinges that are nailed down. The addition in the back has a board and batten door with strap hinges which appear to be original; they are fastened with nails and screws with square nuts. The shed has a large 84 1/4" x 86" panel door on the east elevation; it is attached with strap hinges and has considerable sagging.

Existing Interior

Finishes

The interior walls are partially sealed with boards, suggesting that they were supposed to be completely finished. The window and door casing consists of tongueand-groove boards with the top and sides having the groove face outward, except on the first window which has only one side with the groove. This material was probably used because it was left over from other parts of the structure. The wall to the left of the door is the most finished portion of the interior with sealing boards up to the top of the door frame (Figure F-13). This portion of the wall and part of the north wall has one 9" board running along the bottom, up to the lower level. There is 1/2" tongue-and-groove joined beaded board on the east wall. This finishing material continues to the first window of the north wall, up to 76 1/2" high. The use of different materials would suggest that it

was added later but there is no evidence to support that. On the other side of the door three 8" boards continue along the wall, all the



Figure F-14: 8" boards on right side of door



Figure F-15: Milling equipment

way to the window of the south wall; only two boards continue along the wall until they reach 12" over the lower portion of the floor (Figure F-14). The south wall also has tongue-and-groove beaded boards, 23" above the 9" boards, up to the window. The lower portion in the back does not have any wall finishing.

The ceiling has no finish materials, exposing the roof structure and the hopper above. The storage closet off the back does not have any kind of finishing material.

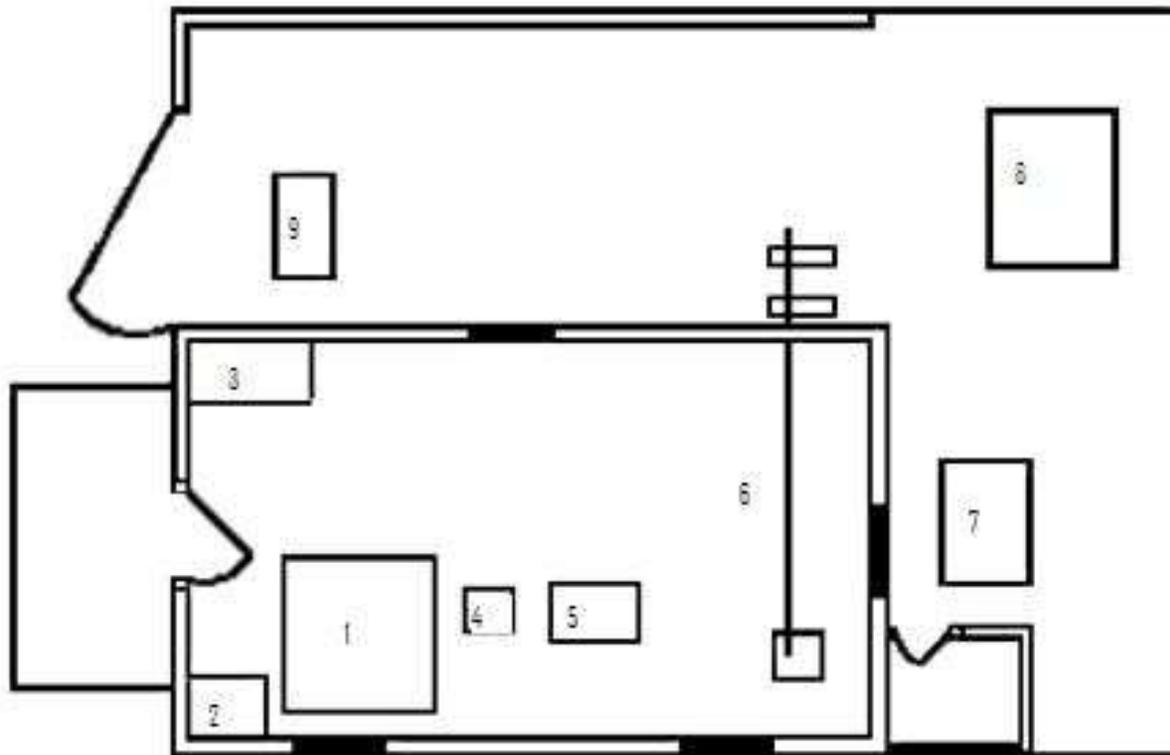
Floors

The floor is divided into two distinct parts, a main portion which is level with the entrance and a back section which is 3" lower. It seems that the floor is lower because the milling process required it to be, which might explain why the main portion has a more finished floor covering. The main portion consists of 3/4" tongue-and-groove finish with a width of either 3 1/4" or 4". The lower portion is less finished and laid perpendicular to the front portion; it consists of rough squared edge plank boards which are roughly 8" in width.

Milling Equipment

There is a storage bin to the right of the entrance in the corner that measures 26" by 31" and slopes up from 37" to 40" on the lid (Figure F-16). In the opposite corner of the door there is another rectangular storage bin measuring 24" by 48" and 25" tall. The grinding machine sits on a wood base that is 61" by 61", with a height of 16". Above the grinder is the hopper which hangs from the ceiling and interrupts a ceiling joist. There is a channel that runs from the top of the hopper to the two shafts that run to the floor, with a base 19 1/4" long. This is connected to the shifter which is a raised bin 46" high and 23" by 36" wide. There is a long axle that runs across the lower floor and exits out the south wall to two wheels on concrete platforms (Figure F-15). It appears that it once had a belt running to another machine which is not there anymore; only the concrete platform remains. The axle also has a wheel in the middle of the room which would have a belt that went outside to a diesel engine, which sits on concrete slabs. On the north end of the axle is a wheel that has a belt running to the back of the grinder.

Figure F-16: Machinery Layout



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Recommendations



Figure F-17: Gap between porch roof and main structure

Program Use

The grist mill is part of a heritage farm that receives visitors, including children, making it an educational resource. It is important that the building appears as it did when the farm was still active, in order for the visitors to experience a turn of the century farm with all its functions.

The grist mill's exterior requires multiple repairs if the building is to be preserved. The roof needs to be made water tight and flashings need to be installed so the water cannot continue to infiltrate the building. The clapboards also need to be repaired in a few places, as do the planks on the shed. Windows also need to be repaired in order to stop deterioration which will compromise the entire window system if it is neglected.

Site Features

- Trim branches from the mature trees on the north elevation.
- Re-grade the south elevation and the west elevations into a swale to divert water away from the wood structure; this will prevent splash back, rot, and termite infestation.
- The erosion caused by the water coming off the north elevation roof needs to be re-graded to provide positive slope away from the building.
- A gravel drainage system should be employed in order to direct the flow of water around the building.
- The entire site needs to be treated for termites.

Structure

- The south elevation and the east elevation of the shed attachment needs to have the entire wall replaced, including the top plate, sill, and multiple studs, because of extensive rot, termite damage, and structural failure which has caused sagging in the door. The new wood should be the same kind as the original.
Replace sill and foundation on closet.
The closet is separating from the main structure because of settling of the foundation. To close the gap the foundation should be lifted.



Figure F-18: Gap between storage closet and main structure

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- The front porch needs to be lifted in the front in order to seal the gap where the roof meets the east elevation.
- The open portion of the south elevation shed has a top plate that is deflecting.
- It should be replaced with a new top plate which is a similar material to the original.
- The shed's west elevation has a top plate that is starting to bend which needs to be replaced with like materials.
- All the posts supporting the shed portion of the structure need to be replaced with similar posts.
- The weight of the grinding machine has caused the two floor joists to bend; this should be corrected by adding a concrete pier under the floor joists.
- The sill under the right window of the north elevation needs to be repaired with epoxy where water has rotted it.
- The stud that frames the right window of the north elevation needs to be

Exterior Envelope sistered, or replaced with lumber which matches the old. new roof should

- All debris needs to be removed from the roof and all holes need to be located. project further off of the eaves and verge board. This will keep the water away
- The roof of the entire structure should be replaced with corrugated steel. The from the structure and minimize splash back. meets the back shed and on the
- Flashings should be installed to the part of the shed roof where the side shed porch roof where it meets the front elevation.

- The spaced lath and continuous lath under the holes in the roof which have been rotted out need to be replaced.



Figure F-19: Clapboards

- The verge board on the front gable and the back gable needs to be replaced.
- The fascia board on the north elevation needs to be repaired with epoxy on the left corner and above the right window.
- The vertical planks at the top left side of the front shed that are missing need to be replaced.
- The clapboard on the south elevation has termite damage at the southwest corner. This should be replaced with materials that match the old.
- The clapboard on the north elevation needs to be replaced on the eastern most side and in any area which has any broken pieces. They should be replaced with materials which match the old.
- The clapboard on the north elevation, where it meets the sill near the right window needs to be made tighter in order to close a gap.
- The clapboard where the south shed meets the west shed needs to be replaced with materials that match the old.
- The clapboard on the east elevation that has been patched with metal should be replaced with materials which match the old.
- The boards on the north elevation of the closet needs to be replaced.
- The corner board on the right elevation needs to be replaced with materials which match the old.
- There is clapboard at the top of the back wall of the closet that needs to be replaced.
- The windows on the north elevation need a repair class II treatment to stabilize them (see appendix) and to prevent more water from infiltrating the structure.
- The window sills on the two north elevation windows and the closet window need to be replaced.

- The window trim on the left window of the north elevation needs to be replaced with similar materials which match the

old.

- The opening at the bottom of the back window needs to have the hole for the belt covered up if the belt is not to be replaced in order to keep animals out.
- The missing pane on the right window of the north elevation needs to be replaced.
- The window on the south elevation needs to be replaced with an identical window as on the north elevation.
- The shutters need to be tightened to stop the sagging.
- The entire structure needs to be cleaned and whitewashed with the trim receiving a coat of darker paint.
- The main door needs to be repaired by tightening all the joints.

Interior

- Planks on the lower portion of the floor need to be nailed back down.
- The boards on the tongue-and-groove sections with the termite damage need to be replaced.

Appendix

Repair Class II: Stabilization

Many windows show physical deterioration, especially in the vulnerable areas mentioned earlier, but even badly damaged windows can be repaired using simple processes. Partially decayed wood can be waterproofed, patched, built-up, or consolidated and then painted to achieve a sound condition, good appearance, and greatly extended life. Three techniques for repairing partially decayed or weathered wood are discussed in this section, and all three can be accomplished using products available at most hardware stores.

One established technique for repairing wood which is split, checked or shows signs of rot, is to: 1) dry the wood, 2) treat decayed areas with a fungicide, 3) waterproof with two or three applications of boiled linseed oil (applications every 24 hours), 4) fill cracks and holes with putty, and 5) after a “skin” forms on the putty, paint the surface. Care should be taken with the use of fungicide which is toxic. Follow the manufacturer’s directions and use only on areas which will be painted.

When using any technique of building up or patching a flat surface, the finished surface should be sloped slightly to carry water away from the window and not allow it to puddle. Caulking of the joints between the sill and the jamb will help reduce further water penetration.

A two-part epoxy patching compound can be used to fill the surface of a weathered sill and rebuild the missing edge. When the epoxy cures, it can be sanded smooth and painted to achieve a durable and waterproof repair.

When sills or other members exhibit surface weathering they may also be built-up using wood putties or homemade mixtures such as sawdust and resorcinol glue, or whiting and varnish. These mixtures can be built up in successive layers, then sanded, primed, and painted. The same caution about proper slope for flat surfaces applies to this technique.

Wood may also be strengthened and stabilized by consolidation, using semi-rigid epoxies which saturate the porous decayed wood and then harden. The surface of the consolidated wood can then be filled with a semi-rigid epoxy patching compound, sanded and painted. Epoxy patching compounds can be used to build up missing sections or decayed ends of members. Profiles can be duplicated using hand molds, which are created by pressing a ball of patching compound over a sound section of the profile which has been rubbed with butcher's wax. This can be a very efficient technique where there are many typical repairs to be done. The process has been widely used and proven in marine applications; and proprietary products are available at hardware and marine supply stores. Although epoxy materials may be comparatively expensive, they hold the promise of being among the most durable and long lasting materials available for wood repair. More information on epoxies can be found in the publication "Epoxies for Wood Repairs in Historic Buildings."

Any of the three techniques discussed can stabilize and restore the appearance of the window unit. There are times, however, when the degree of deterioration is so advanced that stabilization is impractical, and the only way to retain some of the original fabric is to replace damaged parts.

Figure F-20: Site Plan

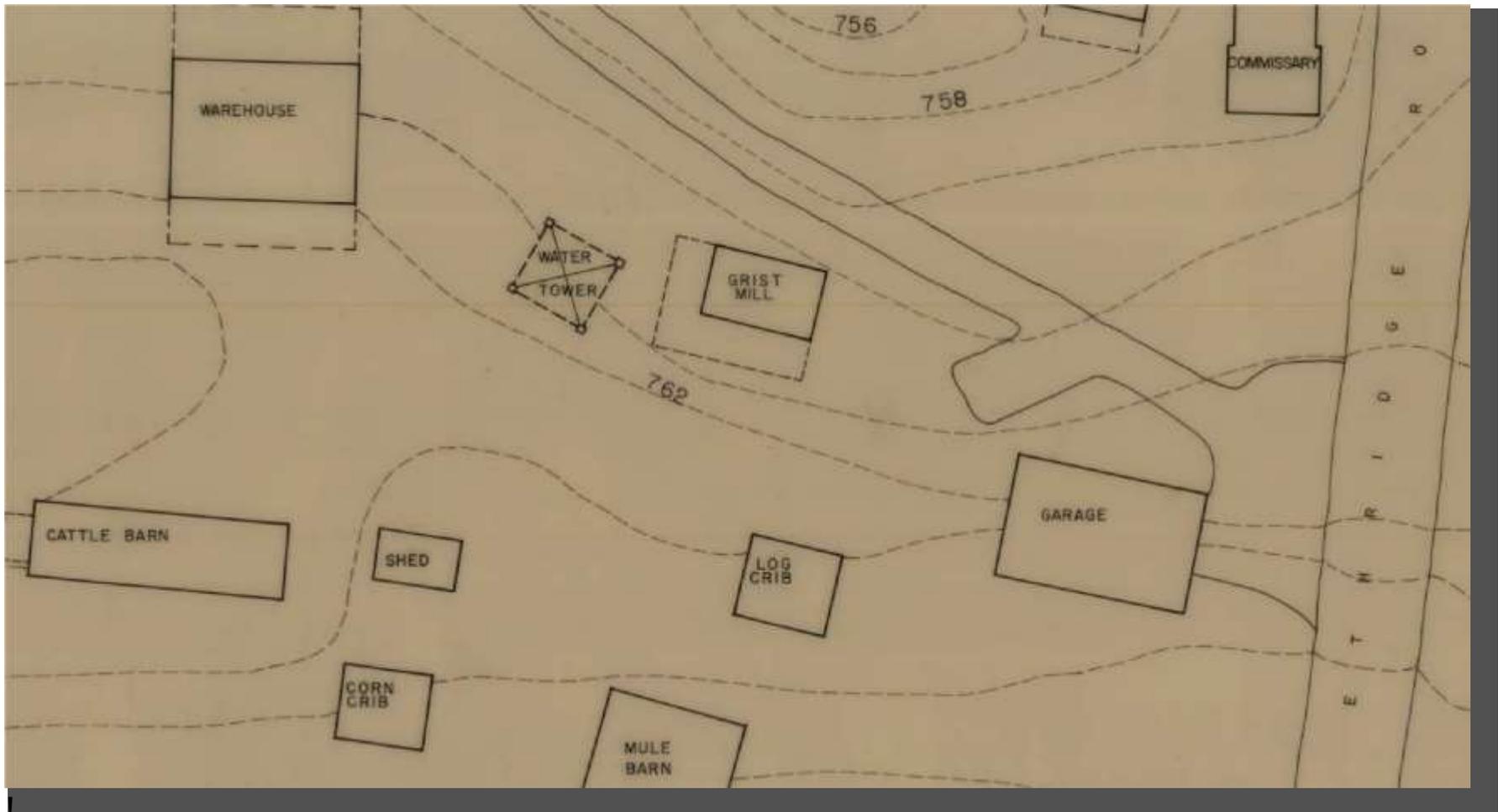


Figure F-21: North Elevation



Figure F-22: South Elevation



Figure F-23: West Elevation



g. the wheat house





Figure G-1: Proximity of magnolia and build up of soil.



Figure G-2: Fieldstone pier foundation.

Introduction

The Wheat House is located in the southeast quadrant of the Shields-Ethridge Farm. It was constructed using balloon framing. The structure is a two-story front facing gable with three one-story attached shed appendages. It has clapboard siding, a galvanized steel roof, and a balcony over the front door.

Wheat farming is an old tradition at the farm but it was particularly emphasized in the early 1900s by Ira Ethridge who built the Wheat House in 1910 for storage and grinding of wheat. Historically, wheat was stored upstairs and chutes moved grain down to the first floor. The shed rooms were used to store wagons and other equipment. Currently, the Wheat House is being used to store a large assortment of objects and materials. The structure was moved approximately 50' west to its current location in the 1950s when State Route 319 (Ethridge Road) was constructed.

Existing Conditions

Grading:

Grade changes over time have led to soil build up and water drainage problems. Water now moves from northwest to southeast, draining into the north elevation

wall. Water also drains from the road towards the east wall. The large magnolia tree to the northeast of the structure has caused soil build up on the north elevation (Figure G-1). The large pecan tree to the west of the structure has caused soil build up on the west elevation. Plants are growing along all four elevations, particularly the south and west walls.

Foundation

The Wheat House rests on fieldstone piers (Figure G-2). Each pier is an irregularly sized shallow grouping of stones and is dry laid. There are four piers under each elevation; one pier in each corner, the others intermittently placed. Additional piers support the interior walls of the central room; one pier in each corner and one under the center of each interior wall. There is no footing to the foundation; piers rest directly on the surface of the ground or slightly below grade. When the Wheat House was moved from its original location, the piers were most likely replaced.

The foundation is failing or missing at most points. If a loose clay-based mortar at one time existed, it no longer does, and all fieldstone piers are in effect dry laid. The combination of settlement and soil build up causes the building to rest directly on the ground in several locations. Where the building is raised above grade, it is only resting on a few small stones. The building's proximity to the ground has led to both insect and water damage. (Figure G-3.)

Exterior Walls

1" x 6" circularly sawn, pine clapboard siding covers the exterior walls. Remaining paint indicates the structure was originally whitewashed with blue paint highlighting the details of the balcony, rake board, eaves, and door and window surrounds.

East Elevation

The east elevation (Figure G-4) is the front façade and faces State Route 319. A batten door is centrally located on the first story of the façade. On the right, adjacent to the door, is a 4/4 pane, single-hung sash window. 2" x 4"s and 1" x 4"s form the door and window surrounds (Figure G-5).

Sliding pine doors form entrances to the shed portions of the structure. The doors are 9' wide by 8' tall and hang from a steel rolling track system which traverses the façade. Door boards are 1" x 8" clapboard siding, held in place by 1" x 3" framing. The first course of siding on each door is missing. (Figure G-6.)

The second story on the east elevation has a batten door and a small balcony. The door is framed by 2" x 4"s. The balcony roof has 2" x 4" joists and rafters and 1" x 4" spaced lath. From left to right the first three joists under the roof are original; the fourth is a replacement that has not been painted. The 5-V galvanized steel sheet roof is painted iron oxide red. The balcony railing consists of 2" x 4" framing with octagonal top rails, and large diamond patterned latticework in lieu of balusters. A hand painted sign reading "Wheat House 1910" hangs just below the balcony floor. (Figure G-7.)

A vertically orientated rectangular vent is located in the front gable above the balcony. A rake board is located under the eave of the front gable. (Figure G-7.) Carpenter bee damage is evident on the east elevation rake board beneath the gable. Powder post beetle damage is also present in the first courses of siding surrounding the entry door.

South Elevation

The south elevation (Figure G-8) shed has two fixed 6-light windows with 2" x 4" frames, and 2" x 8" sills. Both windows are missing glass panes and the left window is missing a muntin. There is 1" x 6" fascia board on the second story roof, and 1" x 4" fascia board on the shed roof.



Figure G-3: Failing fieldstone pier on north elevation and deterioration of siding



Figure G-4: East elevation.



Figure G-5: Window adjacent to entry door.



Figure G-6: Sliding track and north shed door.

The southwest corner post has severe termite damage, which has spread to the sill and siding. The first six courses of siding in west corner of the south elevation are missing or deteriorated (Figures G-9 and G-10).

West Elevation

A single window sash remains on the first floor; all muntins and glass have been removed. The window surround is comprised of 2" x 4"s with a 2" x 6" sill (Figure G-12). The second story has one fixed 9-light window centrally located at the ridgeline of the first story roof. The window surround is composed of 2" x 4"s. A rake board is located under the eave of the gable. There is no fascia board on the first story shed roof.

Termite damage is evident in the northwest corner post, spreading from there to the sill and siding. The first nine courses of siding in the north corner show damage. There is water damage from grade changes and foundation failure on the sill and the first two siding courses (Figure G-13).

North Elevation

Water damage resulting from grade changes and foundation failure has led to fungal growth and rot. The sill and first five siding courses show deterioration (Figure G-15).

A large sliding batten door with randomly placed 1" x 8"s and 1" x 10"s is located on the right portion of the façade (Figure G-16). The steel-sliding track is located on the interior of the shed. There is water damage on the bottom portion of the door. A single window frame remains on the first floor; all muntins and glass have been removed. The window surround is comprised of 2" x 4"s with a 2" x 6" sill (Figure G-17).

Interior Space

There is one central, entry room flanked by shed areas on three sides. On the second story, there is one room located directly over the first story central room.

First Story Central Room:

The wall framing is exposed. 2" x 4" wall studs are spaced 24" on center (Figure G-18). Two grain chutes project diagonally from the ceiling along the north wall. The 2" x 4" framing for the wheat storage bins on the second floor also protrudes through the ceiling. There is a set of wooden stairs located in the southeast corner of the room, leading to the second story. The stair risers are 12" and treads are 8." The ceiling joists are 2" x 8"s and are spaced 24" on center. The joists span 15' 4."

The first floor joists are 2" x 6"s and spaced 24" on center. The span of each joist is 15' 6", and they are covered by random width pine floorboards. The sills under the joists are oak and are half-lapped at the corners.

The floor system of the central first story room is severely damaged. In some areas the fieldstone pier foundation has failed or is non-existent and the sills are resting directly on the ground. The floor joists are no longer tied to the south sill and also rest directly on the ground. As a result, the floor is sloped and the support structure is deteriorating. An analysis of joist load bearing capacity shows that the floor joists are greatly over spanned, almost twice the allowable distance. To determine the extent of rot and insect damage to the flooring, the floorboards would need to be removed. There is evidence of termite damage and active powder post beetles on the west sill of the central room.

Shed Areas

The interior areas formed by the north, south, and west shed appendages are unfinished space, with no flooring and exposed wall framing. The circularly sawn, pine studs vary in size from 2" x 4"s to 2" x 8"s and are roughly spaced 24" on center. The shed windows appear to be later additions. The added window framing would account for the variance in stud size and placement.

A single sheet of plywood separates the north and west shed areas. The steel sliding track for the north elevation door is attached to a horizontal 1" x 6" board located in front of the top plate.



Figure G-7: Balcony and vent.



Figure G-8: South elevation



Figure G-9: Missing siding and deterioration of southwest corner post.



Figure G-10: Termite damage on sill.

The south shed currently houses a large pile of lumber. The lumber, sitting directly on the ground, is heavily termite infested. The presence of the lumber prevented a full inspection of the room.

The west shed contains a large collection of various objects and materials, on the ground and also above the joists. Again, the density of stored materials prevented a full inspection of the area.

The north shed houses another pile of lumber, which also has termite damage. This lumber rests on a storage platform made from concrete blocks. The storage platform is not connected to the structure.

Second Story Room:

The only room on the second story is a partially finished space with pine wallboards. Built-in wheat storage bins are located on the right side of the room. Two wooden chutes inside these bins penetrate the floor and continue to the first story. On the left, two stalls are formed by built-in partitions.

A batten door leads to the balcony on the east wall. On the west wall, a small door swings upward opening to the shed below.

The second story room is also filled with a large collection of various objects and materials, on the floor and also above the joists. The wooden flooring is in good condition, no signs of insect damage or deterioration.

Roof System

Galvanized steel sheets cover both roof levels. The gable has corrugated steel roofing. The shed area has 5-V steel panel roofing. Both roofs are painted an iron oxide red. All wood members in the roof support structure are circularly sawn pine. All nails are 20th century wire nails.

In the gable roof support structure, rafters and joists bear on the top plates of the north and south walls. False plate construction ties the top plates, joists, and rafters together. The top plates, behind the interior wall finish, were not accessible for

measurement. There are eight 2" x 6" joists, measuring 15' 5" in span and spaced 24" on center. Joists are notched to rest on the top plates. There are ten rafters spaced 24" on center. The 2" x 4" rafters are 7' 9" in span. The rafters do not meet at a ridgepole, but are butted and toe nailed together. A 2" x 4" diagonal brace is nailed across the underside of the rafters on each side of the gable.

The three shed rooms have a common roof support structure. To tie into the central portion of the structure, rafters are nailed to the sides of wall studs. Rafters are notched to bear on the top plate of the exterior wall. There are only joists in the center of the west shed. The 2" x 4" rafters are spaced 24" on center with a span of 9' 6". There are ten common rafters in the north and south shed areas and twelve in the west shed area. The top plates on the north and south elevation walls are single 2" x 4"s. The top plate on the west elevation wall is a 2" x 6".

There are eleven ceiling joists in the west shed area. These 2" x 6" joists are spaced roughly 24" on center and are 9' 5" in span.

All spaced lath, on both the shed and gable roofs, are 1" x 3"s and regularly spaced. There are many small roofing nails in the lath. The spacing and nails indicate that the roof covering was once wood shingles.

Overall, the roof support structure is in good condition and no signs of deterioration are present. In exception, the rafter above the center of the north elevation sliding door is severely cracked due to mechanical damage. A falling limb from the neighboring pecan tree probably caused this damage. This would explain damage to one isolated rafter and the corresponding water leakage in that area.

Roof leaks are evident in two other locations. The first rotted area can be seen towards the middle of the ceiling of the central first floor room and in the corresponding place on the floor of the second story. The second rotted area can be found in the northeast corner of the second story room above the wheat bin. The leaks were most likely caused by uplift of the corrugated steel sheets from wind. Nailing down and repainting the galvanized steel roofing can most likely solve the problems. There is no indication that the galvanized steel roofing needs replacement.



Figure G-11: West elevation.



Figure G-12: First story shed window missing glass panes and muntins.



Figure G-13: Insect and water damage to the northwest corner post and first nine courses of siding.



Figure G-14: North and west elevations.

An analysis of load bearing capacity shows that the shed rafters are over spanned. However, the rafters are functioning fine and do not need replacement. The gable roof rafters are adequately spanned.

Further exterior roof analysis is needed. Debris should be removed and metal roofing cleaned to allow for a proper topside visual inspection.

Ratings:

Foundation: Poor

Walls: Fair

Floor Structure: Poor

Roof Support Structure: Good

Roof: Good

Overall: Fair

Recommendations for Preservation

(Listed in order of importance, highest to lowest.)

1. In order to create accessibility for further inspection, everything stored in the building should be relocated. The wood currently stored in the building has been infested with termites and should be disposed of.
2. Plants growing along the building perimeter should be removed.
3. Grading changes around the building should be made to allow for proper drainage and divert water away from the building.
4. Failing or missing foundation piers should be replaced with new fieldstone piers. The long-term solution is to lift the entire building and pour sub-grade concrete footings below new fieldstone and mortar piers. The building should be reset at a higher elevation than at present to prevent recurrence of water problems. Raising it about a foot above present level should keep all wood clear of grade and not

interfere too much with interpretation of its function or authentic appearance; since the building was moved, its original height above grade is unknown anyway.

5. The metal roof should be nailed down where needed, cleaned, and repainted to extend the life of the roof and prevent further water infiltration. When the metal roof needs replacement, it should be replaced with a shingle roof to replicate the original appearance.
6. The floor of the central room should be repaired. The floorboards and stairs should be documented for reinstallation then removed. Built up soil should be excavated. The piers beneath all four walls should be replaced. The rotted sills and joists should be replaced. New joists should be sized and spaced to accommodate the proper load bearing capacity. A girder may be needed. The floorboards and stairs can then be reinstalled.
7. The damaged rafter above the north elevation sliding door should be replaced in-kind or sistered with a new 2 x 4 to prevent further movement.
8. Rotted sills along the north, south, and west exterior walls of the shed should be replaced in-kind.
9. The northwest and southwest shed corner posts have severe insect and water damage and should be partially or fully replaced in-kind.
10. Insect or water damaged siding should be partially or fully replaced in-kind. Damage exists on the north, south, and west elevations, ranging from the first to the ninth course of siding. See “Existing Conditions” section for exact locations.
11. The missing or deteriorated bottom portion of each sliding door should be replaced in-kind.
12. All wood building fabric should be sprayed with Bora-Care, or a similar product, to protect against further insect damage. The ground should receive professional pest control treatment.



Figure G-15: Water damage to sill and first five courses of siding.



Figure G-16: Sliding door and water damage.



Figure G-17: Window with missing panes and muntins.



Figure G-18: Framing and grain chutes.

13. The pecan tree behind the west elevation wall is a potential hazard and should be removed.
14. Window repairs should be made as follows: The missing glass panes and muntins should be replaced in the north and west shed windows. In the south shed windows, the missing glass panes should be replaced as well as the missing muntin in the left window.

h. mule barn



General Description

The mule barn, constructed circa 1916, is a basilica-style barn consisting of two aisles, one on either side of a central nave, or core. The central two-story section has a gabled roof and measures roughly 10 feet wide, while the side aisles have shed roofs extending from the central core. The first floor side aisles are composed of plain concrete block, while the second-story is composed of both flush and lapped pine siding. The east and west elevations of the side aisles contain three doorways, roughly evenly spaced, with board-and-batten doors. These doors are surmounted by lintels crudely made of wood covered with stucco and thus resembling at first glance concrete blocks. This technique is structurally sufficient because the openings are not wide and the lintels lie at the top of the block wall with only wood roof structure above them. The second story once had six windows, three on both east and west sides, which corresponded to the door openings below; all but one has now been enclosed with lapped siding. The entire structure has a galvanized steel roof. The lower portions of the barn are used for animal husbandry, while the upstairs is equipped to cure and store fodder. A narrow opening in the flooring of the second story feeds into a rack, or hopper on the lower story, which serves as a feeding area downstairs.



Figure H-8: General site plan of Mule Paddock and surroundings

Existing Conditions

Landscape

The Mule Barn is located in the southeastern quadrant of the Shields-Ethridge Heritage Farm. The site is bounded by open pasture to the south, the Wheat House and Ethridge Road to the east, the Log Crib with Addition to the north, and the Concrete Corn Crib and additional sheds to the west. The grade slopes slightly from the northwest to the southeast. The southeast corner of the mule barn is at a lower grade, with the northwest corner showing more evidence of water retention and a build-up of soil and leaf litter. The Mule Barn and other structures are situated within a small paddock where animals are actively housed. In general, the site retains a lot of moisture. There is extensive vegetation around the perimeter of the building, in some cases right up to the foundation. There are several trees near the building that pose potential problems. These trees are also producing leaf litter on the site (Figures H-8 and H-9).

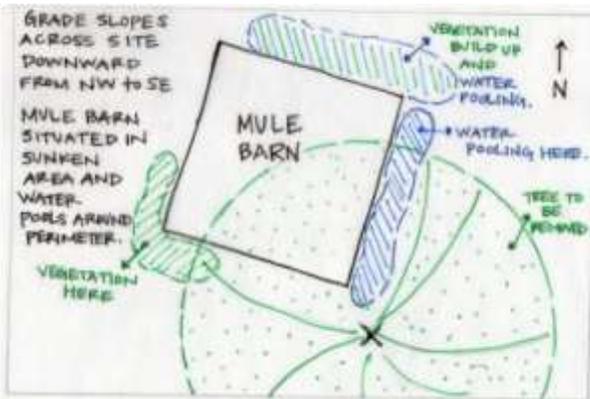


Figure H-9: Detailed site plan

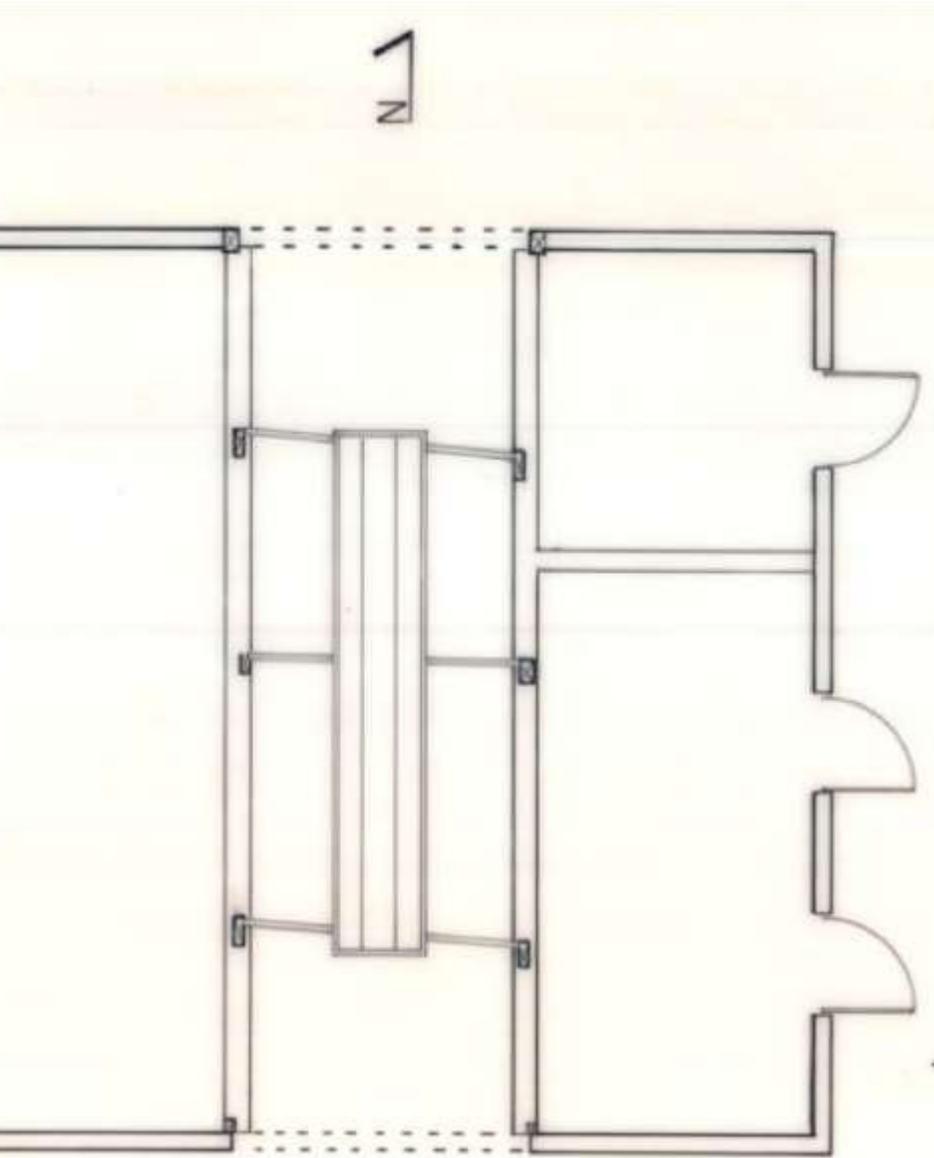


Figure H-1: First Floor Plan

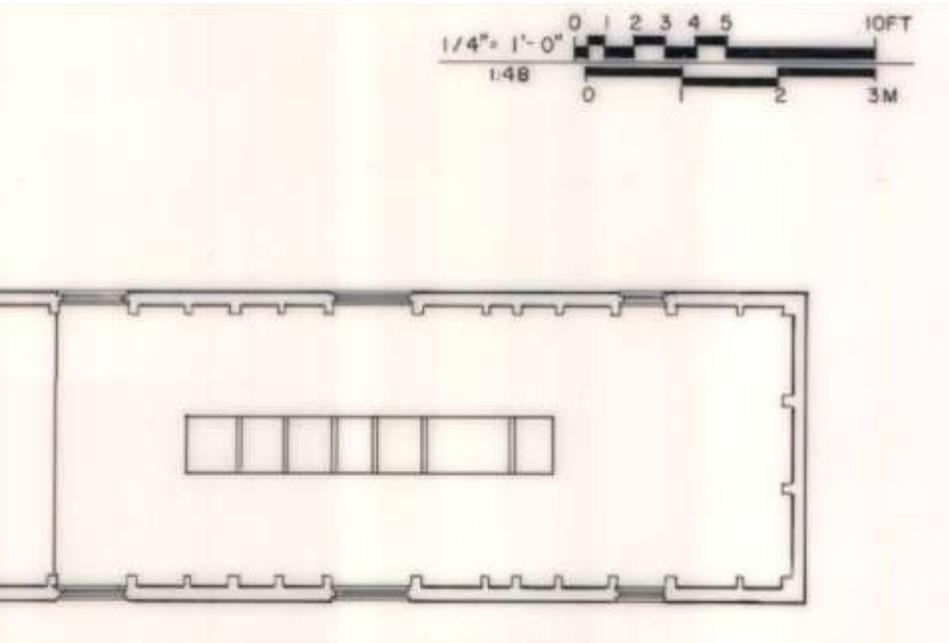


Figure H-2: Second Story Plan

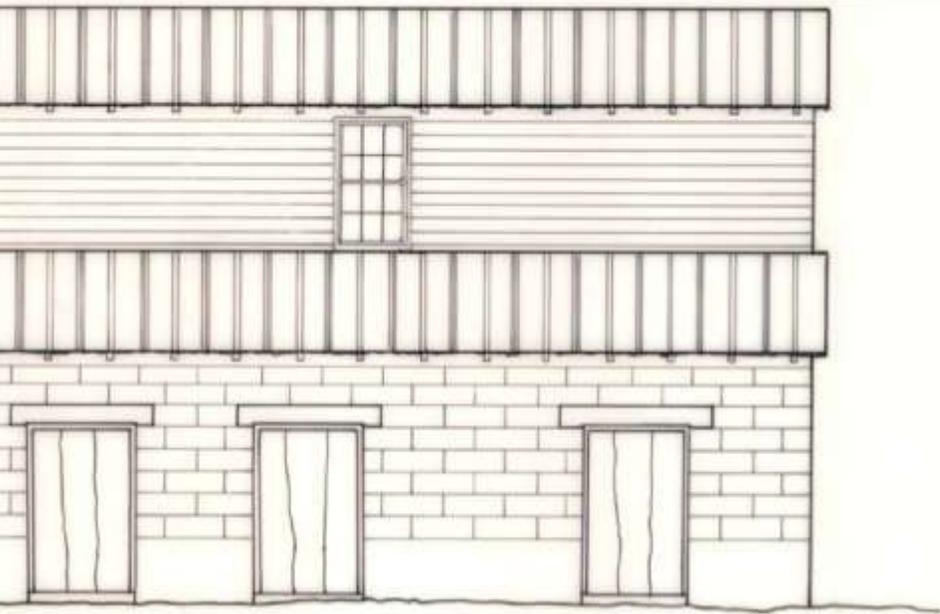


Figure H-3: East Elevation

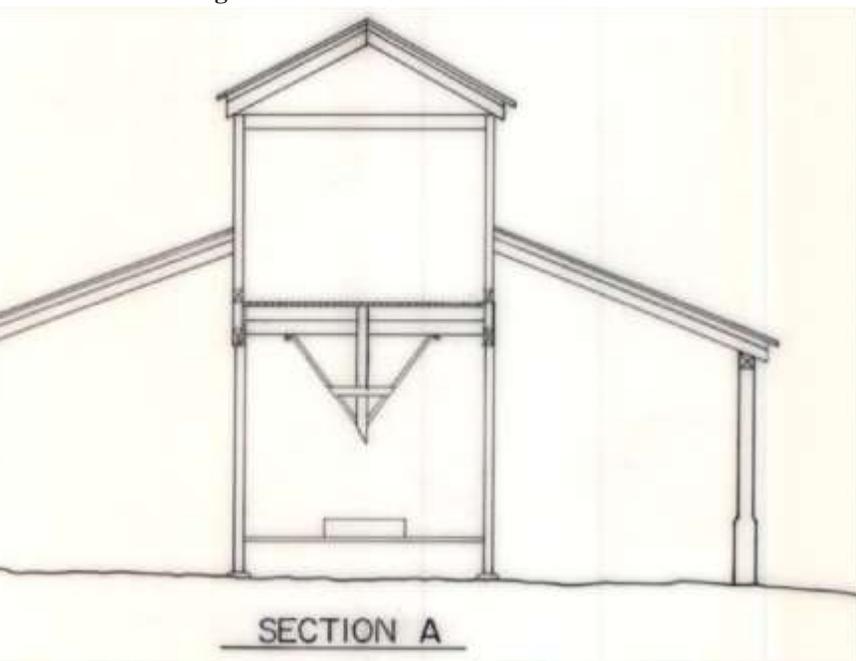


Figure H-4: Mule Barn Section

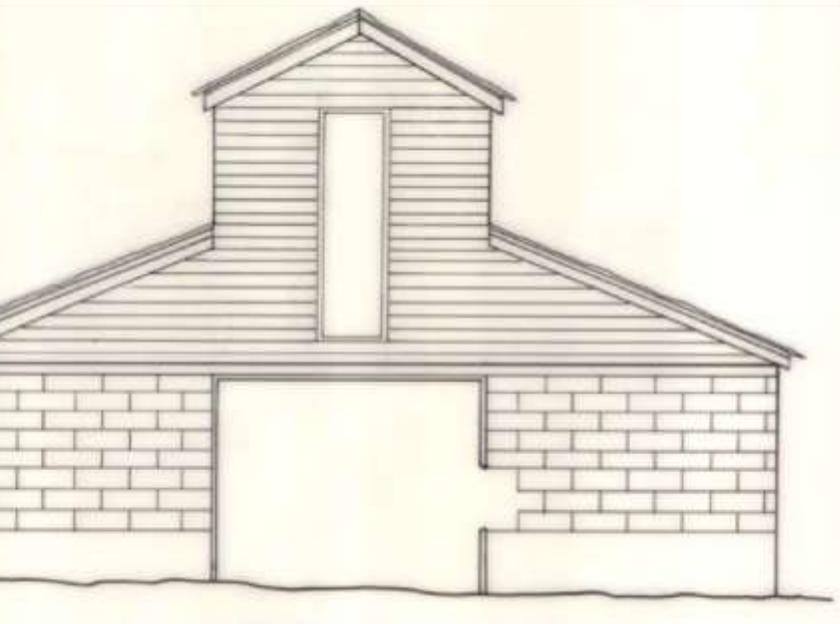


Figure H-5: South Elevation



Figure H-6: North Elevation



Figure H-7: West Elevation

Foundation

The Mule Barn has a poured concrete foundation. A trench was dug and 1" x 12" form boards were nailed to 4" x 4" posts which held the forms in place. The ghosting of these elements is present (Figure H-10). The footing of the foundation extends not only around the perimeter but also forms two aisles within the Mule Barn. Form boards were placed at either side of the open bay of the south and north elevations to create the raised concrete wall foundations. The concrete is composed of locally sourced aggregate and binder. The aggregate for the foundation is composed of rubble and fieldstones ranging in length from 1" to 8." In general the stones that compose the aggregate are larger at the base of the foundation and become smaller in size near the top (Figures H-11 and H-12). The binder in the concrete is composed of clay and lime, with some sand and a range of fine aggregate mixed in as well to create a mortar. This technique is no longer used in pouring concrete; it is a rare, early example of the use of concrete in structures.

Several sections of the foundation have been patched more recently with Portland cement; some patches are flush while others have a beveled edge, serving as a water table (Figure H-13). The foundation shows extreme external deterioration, particularly in sections that have not been subsequently patched using modern methods and materials. The majority of damage in the historic unrepaired sections is a result of rain and rising damp. The deterioration results from a failure of the original materials. The sections patched with Portland cement show less external deterioration, but have exacerbated moisture problems on the interior wall, as water unable to wick through the Portland cement is being pushed out through the interior un-patched foundation (Figure H-14). There is also noticeable deterioration of the foundation on the southeast corner of the mule barn where missing masonry units above have left the foundation exposed (Figure H-15). There are also visible cracks in the foundation where water has leaked straight into it from the mortarless joints in the above masonry units (Figures H-16 and H-17).

Exterior and Wall System

The walls of the Mule Barn are constructed of concrete masonry units at the first story, and wood frame construction on the second. The rectangular concrete units are

7.75" x 23.75" x 7.75" and are hollow blocks with three cells within each unit. The first course of block above the foundation wall has voids filled with mortar, while the blocks in the subsequent courses are hollow. Each block also has grooved ends so that when they are mortared together they form another void at their connection. The exterior face of the blocks is smooth, while the interior face is rough. The corner blocks are shaped differently than the main wall blocks, but retain the same width and height dimensions, while being longer to round the corner.

Mortar between the masonry units is composed of a very fine aggregate, and some show penciled lime-wash on the exterior. Some repointing has been done in places with modern Portland cement. Much of the historic mortar has cracked or separated from the units. The mortar joints closest to the foundation exhibit the most water damage, as they are perpetually moist.

Most of the individual units are completely intact, with the exception of four, which show small cracks (Figures H-18 and H-19). Units that have been compromised due to water damage are wet to the touch, are darker in color where they have been wet the longest, have fungal growth on the exterior, and fungal growth and efflorescence on the interior.

Damage to the roof structure has exacerbated damage to the walls. The east elevation shows obvious bowing. The west elevation shows slight bowing of the top course and shifted masonry units. This bowing has resulted from the fallen tree and subsequent pressure from the remaining, damaged roof structure.

The east and west elevations are roughly identical, each with three bays, identified by three doors on the first floor below three window openings on the second floor. The door jambs are wooden and are face nailed into the concrete. These have separated from the masonry units that surround them. The door jambs are topped with stuccoed wood lintels. Each lintel is constructed of two, circularly sawn 4" x 4"s, which were initially used to hold the form boards for the poured foundation. All of the lintels are damaged or broken to some degree, with many exposing the 4" x 4"s where the concrete has eroded or broken away. Other lintels are missing these imbedded 4" x 4"s entirely (Table H2)



Figure H-10: Ghosting of posts and form boards



Figure H-11: Foundation aggregate

The north elevation has flush horizontal wooden siding on the first story. These boards are 1/2" x 6" and span the entire 10' opening. These boards are slightly warped and cupped and have mold and fungal growth on them. The insides have dark staining and are moist to the touch. On the second story, the clapboard overlaps. This siding is made of various lengths. The siding also encloses a second story window opening (Figures H-21 and H-22).



Figure H-12: Patched and unpatched foundation sections

The south elevation has flush horizontal wooden clapboards that are in good condition. This elevation exhibits less fungal growth or insect damage than the north elevation. The siding on the south elevation measures 1/2" x 6." There is an opening in the second story nave that measures roughly 30" x 84" and has a piece of corrugated steel partially covering it.

On the east and west elevations, the second story of the central bay has overlapping siding and window openings that have been enclosed with clapboards. The east elevation has retained its central window. This window is single-hung with 6/6 glazing. The central bottom pane is missing and one other pane contains cracked glass. The window dates to the twentieth century, and shows no evidence of pegs or tenons. The clapboard on the east and west elevations is identical in dimensions to clapboard on the second story of the north elevation. These clapboards appear newer than the flush sections, and are in good condition.

Roof System and Interior



Figure H-13: Efflorescence in foundation section where exterior foundation is patched

The two-story center portion is constructed of wood. It resembles platform frame construction, but with some unique attributes. The center core is constructed of circularly sawn vertical posts, bearing on the center foundation. These posts are supporting 4" x 9" circularly sawn beams. The beams of the center core are connected to the vertical posts by jack studding. These beams butt into the main posts with jack studs applied to the sides of the main stud, to allow bearing surface for the beams. On the two center posts, the horizontal beams rest on the post and are connected with toenails (Table H1). Each of the six posts has a 2" x 12" wooden member face nailed between them. Floor joists for the hayloft bear directly on the beams. Circularly sawn vertical posts, also bearing on the beams, continue up to support the top plate and roof structure. The posts are capped by a single 2" x 4" circularly sawn top plate. Also bearing on these beams are the vertical studs for the upper portions of the wall. These studs are randomly spaced, circularly sawn 2" x 4"s and 4" x 4"s. Studs around each window opening and each cross tie measure 4" x 4". The stud spacing ranges from 10" to 2'8" apart. The longest spacing between the studs correlates to a window opening.

Side aisle rafters, measuring 2" x 4" are connected to the main structure by tying into a ledger nailed onto the vertical studs. Where the shed roof ties into the center core the rafters bear on a 1" x 6" ledger, which is face nailed to the sides of the second story studs (Figure H-25). The span of the side aisle rafters measures 10'3." There is deflection in the side aisle rafters up to 1/2" indicating the rafters are over-spanned. At one time the shed aisle roofs were roofed with asphalt shingles. These asphalt shingles, beneath the current metal roofing and above the decking, are now evident through the broken rafters due to damage by the fallen tree.

Three tie beams, circularly sawn, two measuring 1" x 6" and one measuring 2" x 6" are face nailed to the studs located within the center portion of the center core, just underneath the top plate. The cross ties are not uniformly spaced (Figure H-25). The first crosstie is 10' from the southern most sill; the second crosstie is 81" from the first, the second cross tie is 78" from the second and 78" from the northern most sill. The second 1" x 6" cross tie on the northern end of the structure shows tongue and groove marks, indicating that it may have been used as a floorboard, or was originally supposed to be used as a floorboard.

Roof structure is composed of 2" x 4" rafters 24" on center, connected to the top plate with bird's mouth construction and toenails. The rafter span is 55.5." Some of the rafters have pulled away from the top plate at the bird's mouth. There is no ridgeboard, rather rafters are butted together at the top and toenailed together (Figure H-26). In one section the top plate is broken and at its broken connection point does not bear on any stud (Figure H-27). Non-uniformly spaced decking boards are 1" x 12"s with 1/4" to 1/2"

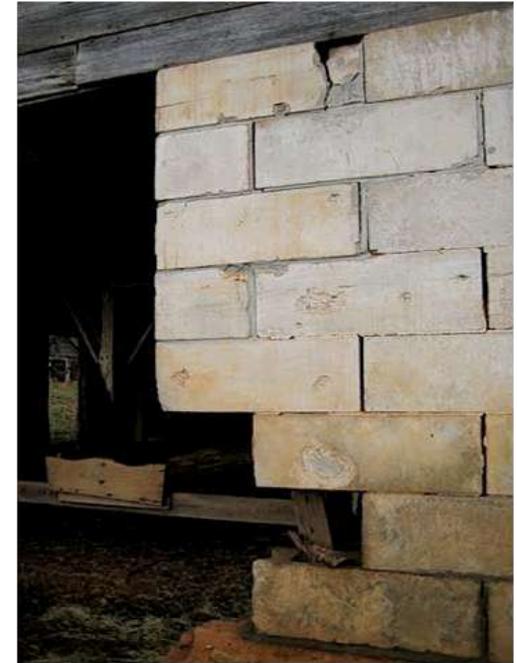


Figure H-14: Mechanical damage to masonry units



Figure H-15: Foundation crack below mortarless joint

spacing between them. Between decking and the metal roof is felt paper. The felt paper is mostly broken and torn. The roof is topped with a 5-V crimped, galvanized steel roof that is painted red. The metal roof is face nailed with lead-headed nails. In general, the upper story decking shows a lot of rot due to water infiltration. The roof is leaking and causing the rot of rafters and decking. One of the decking boards has been replaced by a plywood patch. The water is especially penetrating at the ridge cap. On the west side, the 8th rafter from the south has rotted.



Figure H-16: Repointed with Portland Cement



Figure H-17: Joint with missing mortar

The upper story has a tongue and groove flooring of 1" x 4", circularly sawn floorboards. The floorboards appear in good condition, except for the southern ends which are all deteriorated (Figure H-28). Of the original six windows in the upper story, only one is still extant. The other 5 windows are being stored in the upper story hayloft. Their respective windows openings have been boarded up with lapped siding. The removed window frames are in good condition. Many of the glass panes in these stored windows are broken or missing.

Recommendations

The roof should be immediately removed and the entire structure covered in tarp. This will allow excess weight caused by the damaged roof structure to be removed from the supporting roof structure, and will also allow wooden members to dry.

Once metal is removed, deteriorated decking should be removed and placed in kind. New decking should match the old in dimension, spacing, species, and saw marks.

Rafters and joists should then be repaired. The upper sides of all rafters should be inspected for rot, as this inspection is not possible until the roof has been removed. Small areas of rot can be fixed with epoxy. Members beyond repair should be replaced in kind. New rafters should match the old rafters in dimension, spacing, species, and saw marks.

Replacement of rafters and joists is most necessary in the northwest corner of the roof structure, in both the aisle and second story gable where the structure has sustained considerable tree damage. The roof decking in the northwest corner should also be replaced in kind, and should match the old in dimension, spacing, species, and saw marks. The top plate that does not meet should be brought into alignment, and a 2" x 4" should be sistered on, glued, and screwed together for reinforcement.

The mule barn roof has surpassed its reasonable life span and should be replaced. The replacement roof should maintain the appearance of the old roof. Several options are available, including a 5-V crimp with lead-headed nails, or the application of a modern terne coated steel that has the appearance of the historic metal roof. The specific roof treatment may need to be considered on a site-wide basis.

The supporting interior posts and horizontal beams should be treated with Boracare.

The bowed masonry wall on the east should be squared by being relaid; that on the west can simply be repointed. Afterwards other parts of the structure should be repointed where necessary. When repointed, careful attention should be paid to the mortar composition; new mortar should match the old in composition, color, and joint profile. Lintels should be repaired or replaced.

Additionally, the former windows could be brought back in a restoration treatment, as original materials are still available. The broken windows and sash can be reglazed.

Posts on the north elevation that have deteriorated because they rest on grade should be removed, repaired with epoxy, and stained to match. A concrete pad should be poured under each of these, so that repaired posts can be returned to original position, and will rest on a concrete pad, thereby preventing further deterioration.

Table H1: Interior Post Conditions

P1 Original post is 4" x 4" with evidence of powder post beetles.

The base of original is no longer touching the footing.

Original post has 2" x 4" circularly sawn jack stud on one side and 4" x 4" circularly sawn jack stud on opposite side.

All members show evidence of termite damage, powder post beetles (not active), and degradation due to animal husbandry.

Treatment: Repair damaged sections with epoxy; treat with Boracare.

P2 Single post that measures 6" x 7.5".

Deeply checked.

Powder post beetle infestation (not active).

Animal damage, particularly at base.



Figure H-18: Fungal growth and cracked masonry unit



Figure H-19: Cracked masonry unit and spalling

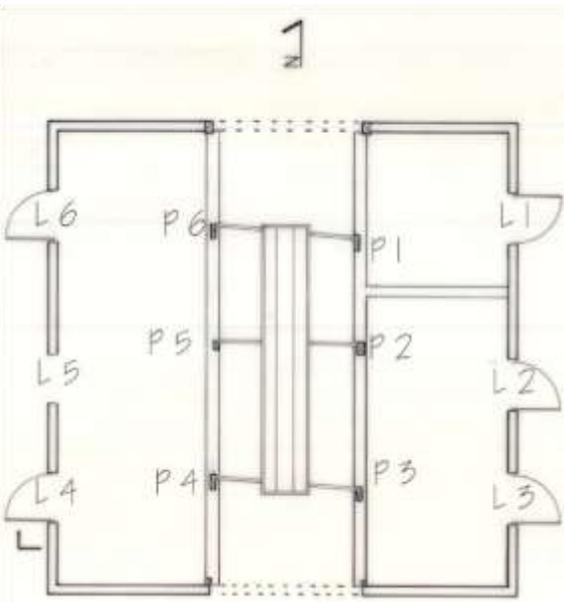


Figure H-20: First Floor Plan



Figure H-21: Flush siding and opening on south elevation

Sistered to a 2" x 4" irregular member in one section.

Treatment: Repair damaged sections with epoxy; treat with Boracare.

P3 Original post is 4"x4" with evidence of powder post beetles.

The base of original has been replaced with 1 foot section of sistered 2" x 3" boards.

Original post has 2" x 4" circularly sawn jack stud on one side and 4" x 4" circularly sawn jack stud on opposite side.

All members show evidence of termite damage, powder post beetle (not active), and degradation due to animals, particularly at base.

Treatment: Repair damaged sections with epoxy; treat with Boracare.

P4 Original post is 4"x4" with evidence of powder post beetles.

The base of original has been replaced with 1 foot section of sistered 2" x 3" boards.

Original post has a 2" x 4" circularly sawn jack stud on one side and a 4" x 4" circularly sawn jack stud on opposite side.

All members show evidence of termite damage, powder post beetle (not active), and degradation due to animals, particularly at base.

Treatment: Repair damaged sections with epoxy; treat with Boracare.

P5 Post is not plumb; leaning and the base has come off of foundation.

Single post that measures 4" x 6".

Separating at top from beam.

Treatment: Support with temporary member; repair with epoxy; treat with Boracare; and square it up, returning base of post to foundation.

P6 Original post is 4"x4" with evidence of powder post beetles.

The base of original is no longer touching the footing.

Original post is sistered to a 2 x 4 circularly sawn board on one side and 4" x 4" circularly sawn post on opposite side.

All members show evidence of termite damage, powder post beetle infestation, and degradation due to animal husbandry.

Treatment: Repair damaged sections with epoxy; treat with Boracare.

Table H2: Lintel Conditions

L1 Extant. Cracking. No exposed post.

L2 Extant. Cracking. No exposed post.

L3 Extant. Cracking. No exposed post.

L4 Only edges of cast concrete present. No imbedded post present.

L5 Cracked and exposing post.

L6 Cracked and exposing post

**Treatment Recommendations: In all cases, the lintels have failed from being over spanned. [?]Existing lintels should be reinforced with steel. The reinforcements should extend beyond the width of door opening, as previous lintel reinforcements did not.*



Figure H-22: Enclosed window opening



Figure H-23: Fungal growth in siding

Table H3: Beam Conditions

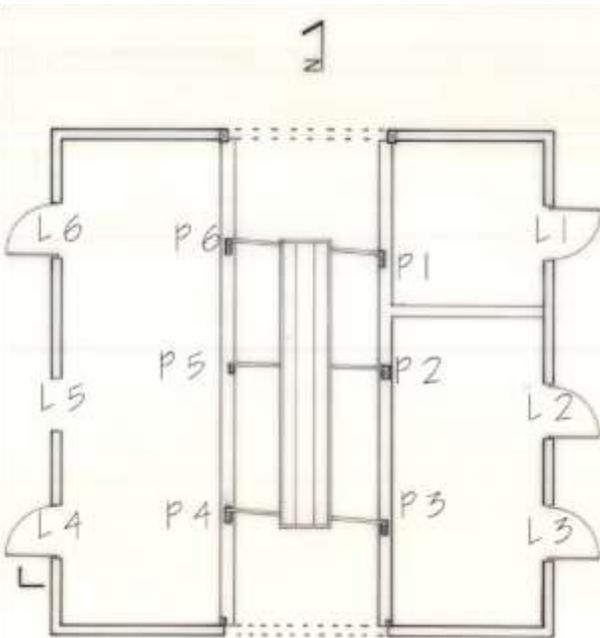


Figure H-24: Posts and Lintels

North end to P1	Measures 4" x 9." Treatment: Apply Boracare.	Good condition.
P1 to P3	Measures 4" x 9." Undersides show powder post beetle damage. Treatment: Repair underside with epoxy; apply Boracare.	Fair condition.
South end to P3	Measures 4" x 9." Notch bearing on sill reduced to 1/2" of bearing surface. Heavily infested with insects. Treatment: Replace in kind with respect to size, dimension, species and saw marks. Connection with the next beam should be half lapped and bolted together to prevent movement.	Poor condition.
South end to P4	Measures 4" x 9." Undersides show powder post beetle damage. Treatment: Repair undersides with epoxy; apply Boracare.	Fair condition.
P4 to P6	Measures 4" x 9". Deeply checked, but checking appears old. Treatment: Apply Boracare.	Good condition.
P6 to North end	Measures 5" x 9". Undersides show powder post beetle damage. Treatment: Repair damaged sections with epoxy; apply Boracare.	Fair condition.

Additional Photographs



Figure H-25: Cross ties, staining in decking



Figure H-27: Top plate failure



Figure H-26: Rafter connection and stained decking



Figure H-28: Floor board deterioration on southern end

i. the concrete crib



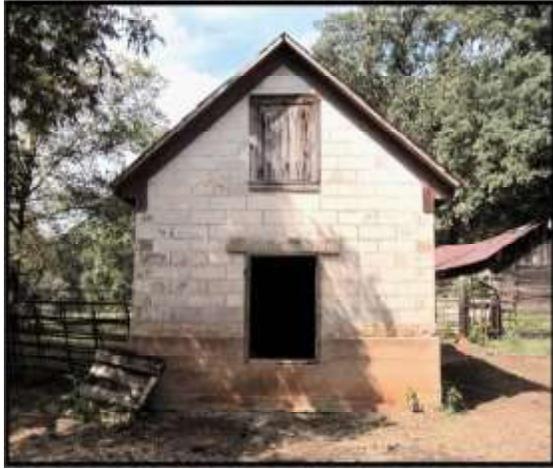


Figure I-1: East elevation



Figure I-2: South elevation

Introduction

The Concrete Crib is located in the southeast quadrant of the Shields-Ethridge Farm. Built in 1916, the structure is rectangular in plan and constructed of cast concrete block. It has a poured concrete foundation and a gabled, galvanized steel roof.

Historically the structure was used for drying and storing corn, as well as for curing and storing meats. Currently it is being used to house hay and other materials for the basic maintenance of livestock at Shields-Ethridge.

Existing Conditions

Grade/Surrounding Area:

The grade surrounding the Concrete Crib has changed over time. Currently, the grading channels water towards the structure. Water movement is primarily from northwest to southeast, depositing water along all four elevations but primarily along the north and east walls. As a result, the grade is lowest along the east wall. Plants grow at the foundation line along all four elevations. Water pools and turns the soil to mud along the north elevation and to a higher degree along the east elevation (Figure I-5).

Foundation

The Concrete Crib's foundation is poured concrete atop a fieldstone footing. Visual evidence indicates that the concrete is composed of lime, clay, and possibly some Portland cement, and that it is mixed in different ratios throughout the foundation. Fieldstones were also used as an aggregate in the mix and are intermittently placed throughout the concrete. Distinct lines left by each level of forms indicate that the foundation was poured in stages. The first lift above grade is 12" in height. The top lift is 9" in height. The foundation tapers towards the top forming a slight batter. There are intentional scratch marks on the outer face, indicating the original intent to cover the foundation with stucco. However, there is no evidence that the concrete was ever covered by stucco.

The presence of water has altered the bearing capacity of the soil and allowed the eastern side to drop relative to the rest of the structure. This is evidenced by two significant structural cracks in the foundation and walls on the north and south elevations. The crack on the north elevation is 1/16" in width at its greatest point. This is a C-3 class crack, rating slight to moderate. The crack on the south elevation is 1/2" at its greatest point. This is a C-5 class crack, rating moderate to severe. The cracks shear through the concrete block in some areas instead of following the mortar joints; this indicates a more significant structural problem. The cracks, particularly on the south elevation, have allowed water to enter and have exacerbated deterioration of portions of the foundation. The age and growth rate of the cracks are unknown. (Figures I-6 through I-9).

Walls

The walls of the Concrete Crib are constructed of cast concrete blocks which are 24" x 8" x 8" in dimension and laid in a running bond. The majority of these concrete blocks are plain, with decorative blocks used in the first course directly above the foundation. The decorative blocks feature a double-wreath or a rusticated design. The first course of the north and west elevations features rusticated units. The first course of the east elevation features double-wreath units. The first course of the south elevation features both rusticated and double-wreath units. There is an additional rusticated unit at the top of the west elevation wall under the gable (Figures I-1 through I-4)

The entrance door is located in the center of the east elevation, approximately 30" above grade and 43" x 60" in dimension. A cast concrete lintel above the door is engraved with 'Ethridge 1916.' A wooden doorframe outlines the entry. The wood batten door is currently detached from the structure and laying on the adjacent ground (Figure I-1)

The east and west elevations feature an upper wooden door located in the gable. The doors and door framing are comprised of 1" x 6" circularly sawn boards. The doors may have been intended for a loft, but there is no evidence of floorboards above the joists to create a loft space (Figures I-1 and I-3).



Figure I-3: West elevation



Figure I-4: North elevation



Figure I-5: Plants and mud along north elevation wall



Figure I-6: Interior view of north elevation cracks

There are two openings at the top of the north and south elevation walls. These openings are each 16 ½” x 83 ½.” Leftover hardware indicates that vents were once used to regulate airflow. The vents were probably similar to those covering the openings on the Seed House. Chicken wire was also installed at some point to cover these openings, and subsequently removed, although pieces of chicken wire remain as evidence (Figures I-2 and I-4).

The roof is gabled, with gables on the east and west elevations. To form each gable, the concrete block walls step inward toward the center, with one unit at the apex. To form a more perfect triangular shape, spaces are filled with smaller cast block on the east elevation and with brick on the west elevation. A rake board to hide the brick and cast block covers the exterior wall surface beneath the gable (Figures I-10 and I-11).

Apart from the two structural cracks, the concrete block walls are in good condition. There are a few insignificant hairline cracks. The rusticated blocks, particularly along the west elevation, show minor erosion. This was caused by the design of the block, which protrudes out at the bottom of an otherwise flush wall surface.

There is evidence of powder post beetles (no longer active) in the entry door framing. The cast concrete lintel above the door is starting to erode, particularly on the interior side, and aggregate is falling away. At this point the damage is just cosmetic, not structural (Figure I-12).

The upper doors are in fair condition, but show signs of weathering from sun and rain exposure (Figure I-13).

Roof System

The wood top plate, joist, and rafter roof support system are connected using false-plate construction (Figures I-14 and I-15). At the base of the roof support structure, 6 ½” x 6 ½” top plates bear on the north and south elevation masonry walls. The top plates are bark edged indicating an oak species, are circularly sawn, and are 22’ 6” in length.

Ten circularly sawn pine joists bear on the top plates (see Image 14). These 2" x 6" joists span 14' 11 1/2" and are spaced 24" on center. The first and last joists rest against the east and west elevation walls. The joists overhang the top plate on the exterior by 11 1/2". 1" x 8" fascia boards cover the joist ends (Figures I-2 and I-4). Two parallel 1" x 8" false plates lay atop the joists. 2" x 6" blocking fills the spaces between the joists, above the top plate and below the 1" x 8"s (Figures I-14 and I-15).

The 2" x 4" pine rafters are 11' 5" in length and 8' 2" in span. The middle eight rafters are spaced 24" on center and are positioned directly above the middle eight joists. There is greater spacing in the first and last bays. The spacing from the rafter along the east wall to the next rafter is 32 1/2" on center, and the spacing from the rafter along the west wall to the next is 31 1/2" on center. The rafters are toe-nailed to the outer edge of the 1" x 8" false plates. The rafters do not meet at a ridgepole, but are butted and toe-nailed together (Figure I-16).

Above the rafters is 1" x 3" oak and pine spaced lath. Lath spacing corresponds to the roof's shingle nailing pattern. There is a greater grouping of lath around the apex of the roof (Figure I-16).

The roof is covered with patterned galvanized steel, either shingles joined to make horizontal sheets or horizontal sheets stamped to resemble shingles; closer inspection could reveal which is the case. The sheet metal is painted an earthen red tone (possibly an iron-oxide based paint). Two shingle designs are found in the roof, indicating that the roofing materials may have been left over from other projects. The ridge cap is also of galvanized steel and painted the same color (Figure I-17).

Exterior wood surfaces, now faded, appear to have been painted the same red tone as the galvanized steel. All nails are 20th century wire nails with rounded heads, straight shanks, and tapered points.

The roof support structure shows no sign of structural damage. The following cosmetic damages exist. The oak top plates have checking. The deflection of the rafters in the center of the roof is 1/2." Otherwise, there is no sign of rafter or joist movement.



Figure I-7: Exterior view of North elevation cracks



Figure I-8: Interior view of South elevation cracks



Figure I-9: Exterior view of South elevation cracks



Figure I-10: Cast block used to fill in spaces under east gable

On the second joist from the east wall there is evidence of salt damage caused by curing meat. There is minor evidence of carpenter bees in the rafters. There is no interior evidence of water penetration, i.e. no signs of leaks or rot. There is a minor amount of rusting on the underside of the galvanized steel shingles where nailed.

On the exterior, the shingle in the southwest corner of the roof is missing. As a result, there is water damage to the underlying wood members and finish materials. Without removing more of the shingles, it is difficult to determine the extent of the rot. Approximately a 3' square area may be damaged (Figures I-18 and I-19).

Ratings:

(Evaluations based on an excellent, good, fair, poor system.)

Foundation: Fair

Walls: Fair

Roof support structure: Good

Roof: Fair

Overall: Good

Recommendations for Preservation (highest to lowest priority)

1. The cracks on the north and south elevation walls should be monitored to determine the growth rate.
 - a. If there is no further movement, a masonry epoxy grout should be applied to the foundation and wall cracks to prevent further water infiltration.
 - b. If more movement is detected, new concrete and steel reinforcement bar footings should be poured sub-grade to stabilize the foundation and prevent further wall cracking and movement.

2. The missing galvanized steel roof should be replaced in-kind.
3. The damaged wood roof members and finish materials in the southwest corner should be repaired or replaced dependent upon the level of deterioration discovered. Approximately a 3' square area may need to be replaced.
4. Grading changes should be made around the building to facilitate proper drainage.
5. Missing or rusted nails should be replaced to secure roof shingles into place. Shingles should be nailed down wherever they have started to come up, particularly at the gable edges.
6. The wood of the doors, windows, and roof structure should be sprayed with Bora-Care to prevent further insect damage.
7. To prevent further sun and water damage, the upper door on the west elevation should be weatherproofed with a 50/50 mix of boiled linseed oil and Thompson's Water Seal.
8. Any deteriorated fascia board should be replaced, as needed, beginning with the fascia board on the west elevation.
9. The entry door on the east elevation should be reconstructed to replicate the historic appearance. The door would control entry to the building, which may be important to an adaptive use of the structure.
10. The missing vents for the north and south elevation openings should be replaced to best replicate the historic appearance and control airflow. The vents covering the openings on the Seed House can be studied as an example.



Figure I-11: Brick used to fill in spaces under west gable.



Figure I-12: Cast concrete lintel above entry door. Note deterioration above right door corner.



from sun and rain exposure

Figure I-13: Upper west elevation door, weathering



Figure I-14: Rafters, false plate, joists, and top plate



Figure I-15: Close-up of false plate, joist, and top plate

Figure I-16: Joists





Figure I-17: Galvanized steel shingles and ridge cap



Figure I-18: Southwest corner of roof, missing



shingle and resulting water damage shingle and resulting water damage

Figure I-19: Southwest corner of roof, missing

j. east log crib / hog pen



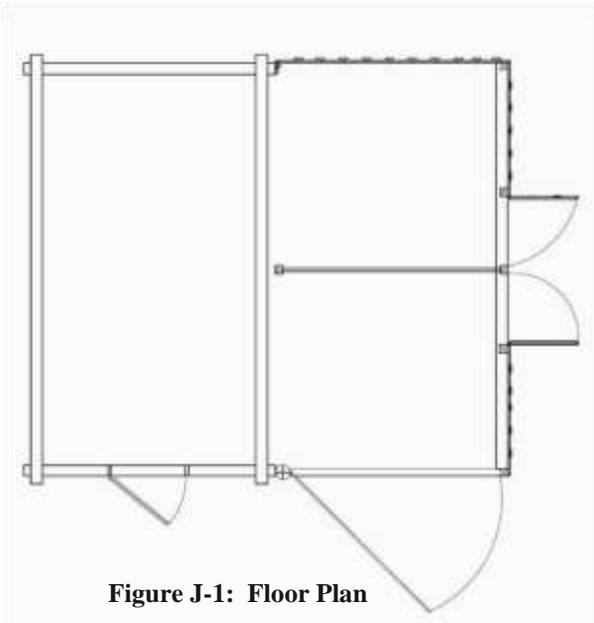


Figure J-1: Floor Plan



Figure J-2: North elevation

General Description

The log crib could have been constructed almost any time in the nineteenth century though a date earlier than other farm buildings might be suspected. It was probably moved to the present site from the original Shields home site. It is a rectangular structure measuring 10' 3" x 18' 3" of hewn log with half dovetail corner joints. The crib has one opening on the south elevation measuring 3' 3" x 3' 6" which can be closed with a board and batten shutter. A braced frame, shed addition is located on the east elevation. Also rectangular in plan, the shed measures 9' 6" x 17' 9" and is covered in vertical pine board-and-batten siding. The addition contains a set of paired board and batten doors on the east elevation as well as a gate, which composes the entire south elevation. In photos taken of the Shed addition in the early 1990's, the south gate is not present, which would indicate that the gate has been added subsequently. The gate is made of horizontal wooden members and is hinged to the corner post on the southwest corner. Together, the entire structure measures roughly 19' 9" x 18' 3" and is situated at the north side of the paddock where the mule barn and shed are also located (Figures J-1 through J-5).

Existing Conditions

Landscape

The site conditions are similar to those of the mule barn. On the west elevation, a large amount of leaf litter and debris has collected, building up the grade on this side of the structure. Vegetation grows near and under the structure on the west, north and south elevations. Additional vegetative elements that provide most of the leaf litter and could threaten the structure are large trees located near the crib. Most significantly, one is 6' to the southeast and one at the base of the Wheat House to the east. Two others are roughly 48 feet to the west, and 58 feet to the northwest (Figures J-6 and J-7).

Foundation and Floor Systems

The log crib has a foundation of fieldstone piers. There are six piers of stacked fieldstone, with three piers located on both the east and west sides. Each side has a pier at the corners as well as mid-span (Figure J-8). There is no evidence of mortar between the fieldstone. Larger stones are placed at the ground level and act as the footing, and smaller fieldstones are then stacked vertically to form the piers.

Currently, the structure slopes downward towards the west due to settling. The piers that support the west side of the crib are damaged and deteriorating, causing the structure to settle unevenly. The western side of the structure appears to be settling deeper and faster than the eastern side (Figure J-9). Over time, the structure has settled and has begun to rack. These conditions have been exacerbated by a fallen tree that landed on the west side of the roof, damaging the logs and piers. Three of the four fieldstone piers show cracked stones, fallen stones, or are separated from the foundation and no longer function properly.

Installed between the first and second course of logs is rough, heavy wood plank flooring. The planks are sash sawn, range from 1.5” to 2” thick, and are not uniformly sized. This flooring bears directly upon the first course of logs (Figure J-10). There are no visible nails, and the floorboards appear to be held in place by the weight of the logs above them. In general, the condition of the flooring is poor. 50% of the floor planks, most located on the southern end, are wet, rotted through mid-span (Figure J-11).

Exterior and Wall System

Two hewn sills bear directly on the foundation piers on the east and west sides (Figure J-12). On the north and south sides, two sills hewn on the inside face bear upon the east and west sill logs with a half-lapped notch (Figure J-13). Additional logs, which are hewn on the inside face, are then stacked on this initial course of logs, interlocking at the corners with half-dovetail joints (Figure J-14). The walls are structural and are hewn on the inside face to form an interior with logs flush with one another, while the exterior appear to have been peeled and left rounded. The spaces between the logs are thin and show no evidence that they have ever been filled with chinking material. There are 7 courses of logs forming the walls, excluding the sills. The logs range in size from approximately 12” to 18” in diameter.

The sill on the west side is on grade and badly deteriorated. The sill on the east side is not as exposed to the elements because of the protection from weather offered by the adjoining addition, and is still on top of its foundation piers. Both sills show water and insect damage at the end grain. The north and south sill are in different conditions. The sill on the south side has been notched to allow pigs under the structure and appears to be in good condition. On the north side, the sill has been exposed to more weather and has rotted through on its northwest corner.

In general, the walls all exhibit water and insect damage to a varying degree, particularly on the north elevation which shows the most extreme deterioration. The logs forming the east elevation are in the best condition, as they have been protected from the elements by the shed addition. Logs on the south elevation also appear to be in good condition, while on the west elevation, the lowest logs are on grade and show



Figure J-3: East elevation



Figure J-4: South elevation



Figure J-5: West elevation

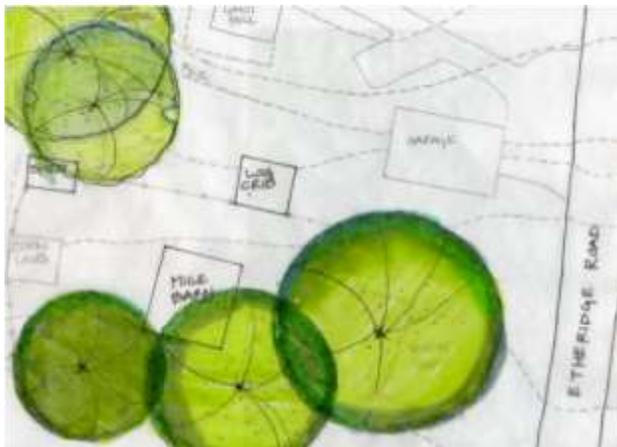


Figure J-6: General Site Plan

damage caused by insects and rot. For further discussion of specific logs, condition assessment, and treatment recommendations, see the tables on pages 164-167.

The south elevation has an opening with a board-and-batten shutter (Figure J-18). The crude window jamb is notched with pegs through the exterior logs to the interior (Figure J-19). The shutter is notched in place with wooden pegs, cut nails, and spikes (Figure J-20).

The top course of logs connect the walls to the roof system. Like the sills, these logs are smaller round logs, hewn on the top and bottom, and bear on the log below them with a half-lapped notch, instead of a half-dovetail notch. These top plates were also attached to the course below with large, round, wooden pegs. While there should be two top logs, one each on the east and west elevations, there is only one, as the top log on the west has fallen and is missing entirely. This has caused the other top plate on the east side to shift out of place, and it is now resting directly on the roof of the shed addition (Figure J-21).

Roof System

A gabled roof is covered with a skin of horizontal planks of wood. These are nailed to non-load bearing, gable end studs. These are round, vertical log poles that have been toenailed into the uppermost log course. The top of these gable end studs are beveled and toenailed to the rafters. The gable on the north elevation is extant and appears in good condition (Figure J-22). The gable on the south elevation no longer exists, as it has been crushed in the roof damage sustained by a tree that fell directly on the roof (Figure J-23).

In general, the roof system is composed of rafters, spaced lath and corrugated metal panels. The rafters are small, de-barked log poles left in the round and are sized at roughly 3 1/4" in diameter. The rafters have a span of 51." These rafters bear directly on the top plate and are toenailed in place with cut nails. The rafters are joined at the ridge with gusset plates. Gusset plates are face nailed to the rafter with large wire nails. The rafters on the north and south ends are missing their gusset plates. The rafters are generally in good condition, with the exception of those that have been deeply cracked and sheared from the fallen tree. Three of the six rafters are intact and still meet at the

ridge, while the other three rafters are wet, rotted and broken at the ridge (Figure J-20 and Table 5).

The spaced lath is composed of non-uniformly sized, sash-sawn boards ranging in width from 4” to 1’3” and is nailed into the rafters. There is no material between the spaced lath and the sheets of corrugated, galvanized steel that forms the roof skin. Scattered nails in the spaced lath indicate that the roof once had a wood shingle finish. A ridge cap, also of corrugated metal, is present. The spaced lath shows water damage and rot. Some appear broken and cracked. The metal roof has been damaged beyond repair by the fallen tree.

Shed Addition

Existing Conditions

The shed addition is part of a long tradition of impermanent, post-in-ground structures; it is a three-sided structure attached to the log crib on the crib’s east elevation. The structure is entered through paired board-and-batten doors on its east elevation. Additionally, the south elevation is entirely composed of a wood and metal gate that opens into the paddock. Because the shed is not original and is different structurally than the log crib, we address it as a separate structure.

Landscape – See description on page 154

Foundation

The shed addition has no real foundation. The corner post on the southwest corner is embedded directly in the ground with no evidence of a footing (Figure J-13). The southeast corner has a foundation pier, while the northeast corner has a single stone embedded in the ground that acts as a footing. There is no pier or footing at the northwest corner.

Exterior and Wall Systems

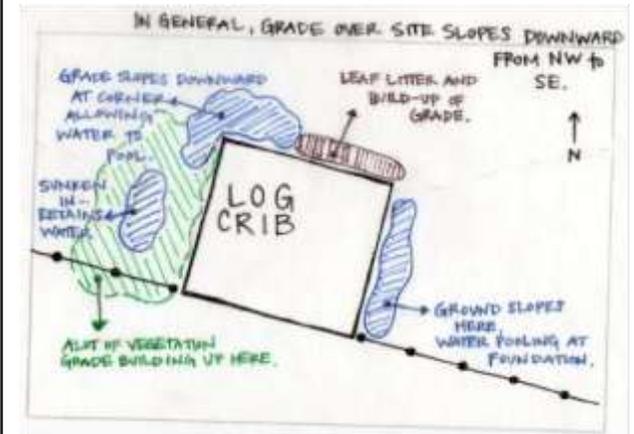


Figure J-7: Detailed Site Plan



Figure J-8: Southeast foundation pier of Log Crib



Figure J-9: Slope and Settling of Log Crib



Figure J-10: Exterior photo showing ends of floor planks installed

Sill plates run along the south, east and north elevations. The sills vary in size on each side, but are connected with half-lapped joints. The rounded, pressure treated post on the southwest corner is toenailed to the sill on the southwestern corner, but they are currently separating (Figure J-13). The sill on the south elevation is circularly sawn and measures 4" x 7". It exhibits rot, termite damage and fungal growth. It has been sistered with other planks of wood for reinforcement. The sill on the east elevation is 6" x 7" and is also circularly sawn. This sill has rotted through and broken mid-span. On the northern end of the east elevation, the sheared end has been replaced by two 2" x 6" sistered beams that act as the sill, but do not rest on the footing at the northeast corner. On the northern elevation, the northeast corner of the sill rests on the footing and then slopes to grade towards the northwest corner.

The south elevation has no wall, but is simply a gate of horizontal wooden members supported by four metal braces (Figure J-26). This gate is hinged to the southwestern corner post. The corner posts on the east elevation are both wooden posts measuring 4" x 4". The corner post on the southeast corner shows damage by powder post beetles. The corner post at the northeast shows termite damage at the footing.

On the northern elevation, a central stud between these posts is also 4" x 4" and is toenailed into the sill plate, as are the cornerposts. This center post has an irregular bark edge and damage from powder post beetles. The corner post on the northwest corner is 1.5" x 6" and is sistered to a 1" x 3".

The structure has 2" x 4" corner braces on all corner posts. The only wall with intermittent studs is the north elevation. These studs are each 4" x 4", with one sistered to a 1" x 3" stud for reinforcement. 1" x 4" horizontal girts run between the corner posts and studs, each with a beveled edge that is toenailed to each corner post and stud. This horizontal member is used as a nailing surface for the vertical, circular sawn, pine board-and-batten siding. These siding boards are not uniform but have an average dimension of 1" x 12"s; the batten range in size from 1/2" x 3" to 1/2" by 5". These boards are in fair to poor condition. Siding on the north elevation shows termite damage largely at the bottom which rests on grade. On the east elevation, the boards at the northern end also show evidence of termite damage.

Interior

The shed is divided in the middle by a crude wall. There is no footing or top plate for this wall. Wood planks are face nailed to four intermittently placed 3" x 4" studs, which rest at grade. Because of the poor construction and materials the wall is leaning and unstable.

Roof System

A shed roof connects directly to the east elevation of the log crib. Circularly sawn rafters, ranging in size from 2" x 4"s to 2" x 3"s, are face nailed into a ledger strip on the east elevation, extend upwards and are then beveled and toenailed directly to the log walls. This ledger strip and many of the rafters have become displaced, particularly on the southern half of the addition due to a fallen tree. On the south elevation, vertical planking identical in size and dimension to that of the north and east elevations covered the shed roof's half-gable above the gate. Like the rafters, this section of siding remains in one piece but has become dislodged from its original position (Figure J-25). The span of these rafters is 10' 3." There is non-uniformly sized, circularly sawn spaced lath above the rafters. The lath has dark staining and is deflecting and cracked in places, particularly in the north stall due to tree impact. The metal roof is comprised of two different types of galvanized steel, 5-V crimp and standing seam; both are face-nailed with lead-headed nails. The poor construction and patching of the different metals inhibits the roof's function, allowing it to leak.



Figure J-11: Damaged floor boards inside Log Crib

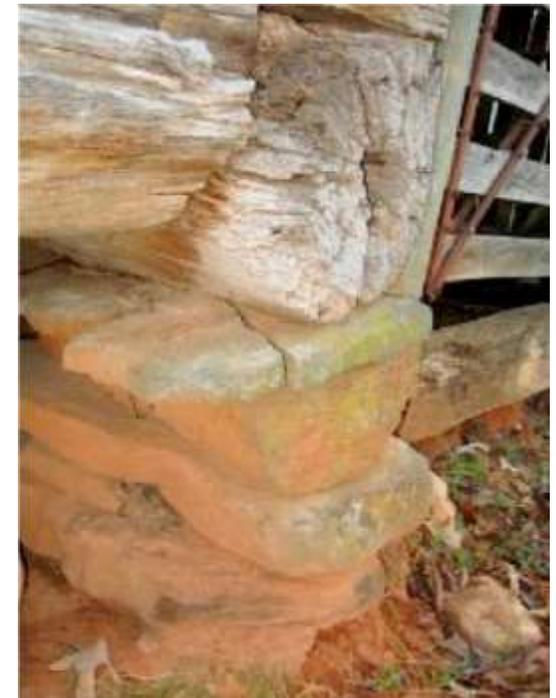


Figure J-12: End of sill resting on foundation pier on northeast corner

F



ed notch bearing on top of eastern sill

Log Crib and Shed Addition Recommendations

The type of recommendation is one of restoration. Due to the level of damage and deterioration sustained by the structure, a significant amount of intervention is necessary.

The entire metal roof should be immediately removed to prevent further racking, settling, and damage to structural members. The structure should then be tarped to prevent further deterioration and water infiltration. The tarp will also allow members to dry.

Disassemble the log structure. Each log should be carefully numbered so that when reassembled, all logs will go back to their original position. While being repaired, these logs should be put in a shop, where they are allowed to dry and worked on in a covered environment. Each log should be treated according to the recommendations given in Tables 1 through 4.

The site should be cleared of debris, vegetation, and trees. It should also be graded so that built up soil is excavated from the structure's site, and in such a way that water is directed away from structure and its foundation.

At this time, fieldstone piers should be put on footings and restacked and repointed where necessary. Piers might be built somewhat higher than they are now to insure that the wood stays away from ground moisture.

Assemble logs, placing the logs back in their original position, according to the numbering system. The floor system should be reinstalled in its original position; those in good conditions should be retained, while the 50% in poor condition should be replaced in kind with respect to texture, saw marks, dimensions.

The specific date of construction for both the log crib and shed addition are unknown. Because the shed addition is listed as a contributing part of the structure in the National Register of Historic Places, it should be retained and repaired. The deteriorated sills, rafters, and spaced lath should be replaced in kind, with respect to size. The doors and handmade wooden latches should be retained. The siding showing evidence of termite infestation, particularly on the north elevation, should be replaced in kind with respect to size. All members should be treated with Boracare to prevent further rot or insect damage.

Because of the relatively small surface area of the roof s

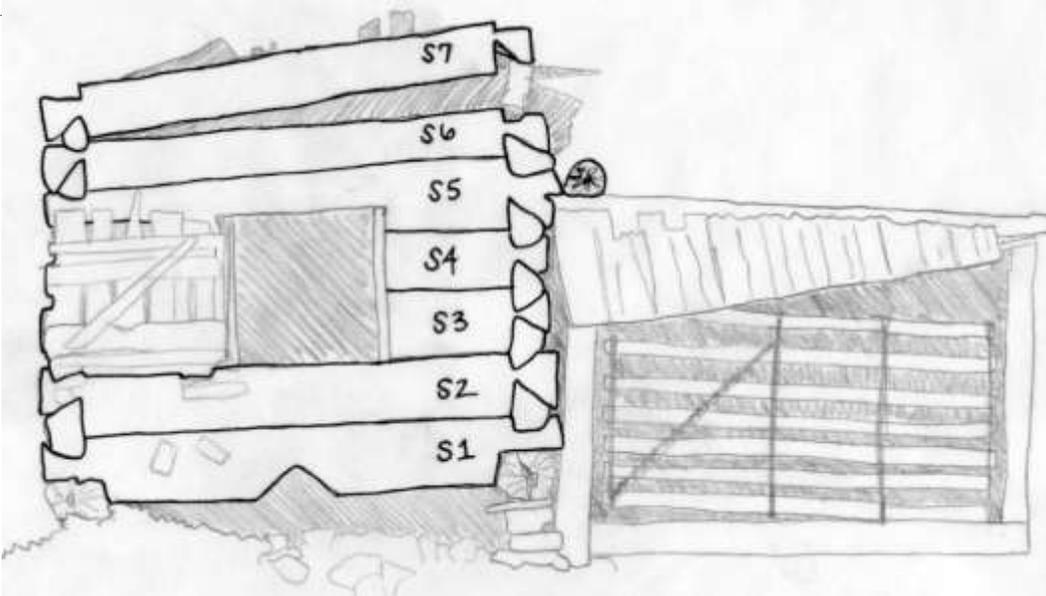
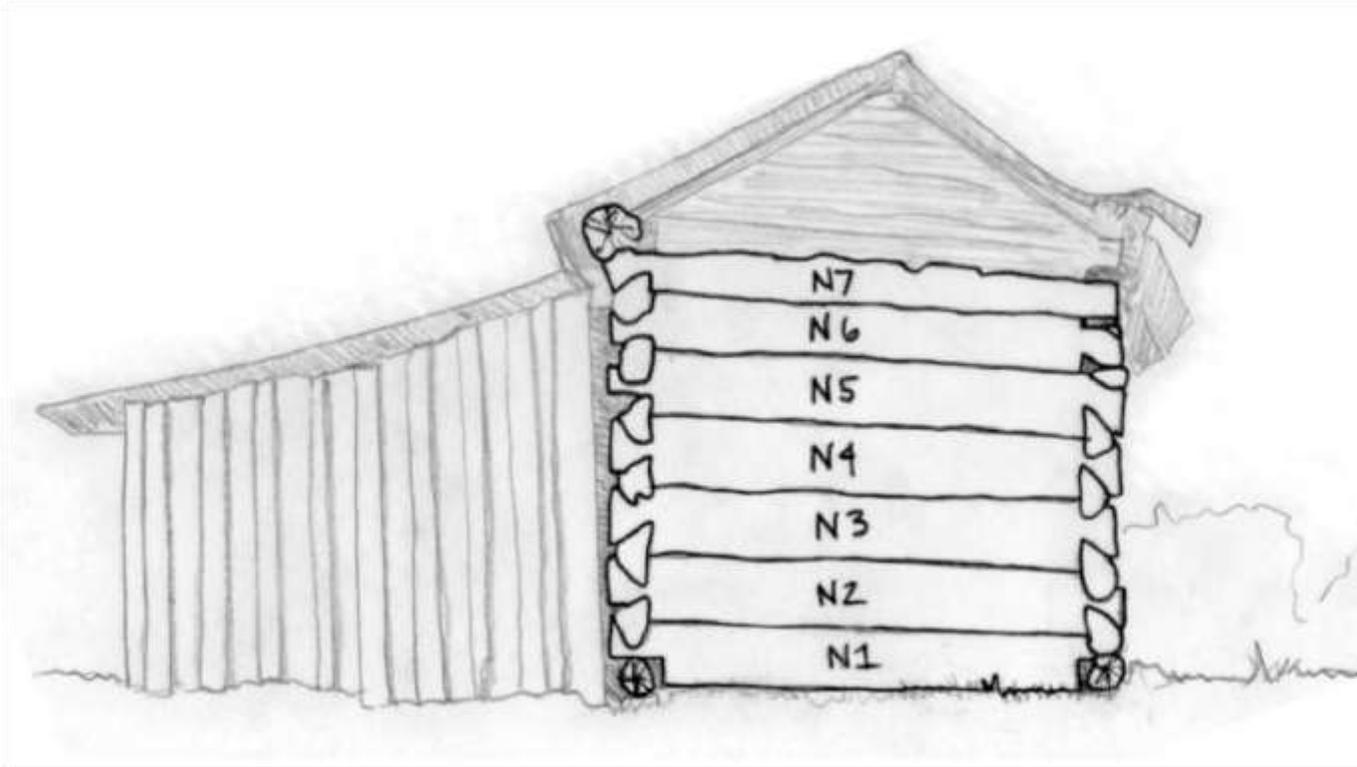


Figure J-15:



intervention recommended, the metal roof should be replaced and restored with wood shingles. The shingle size should be dictated by the spacing of existing spaced lath.

Figure J-14: South Elevation Log Conditions

Figure J-16: West elevation log conditions

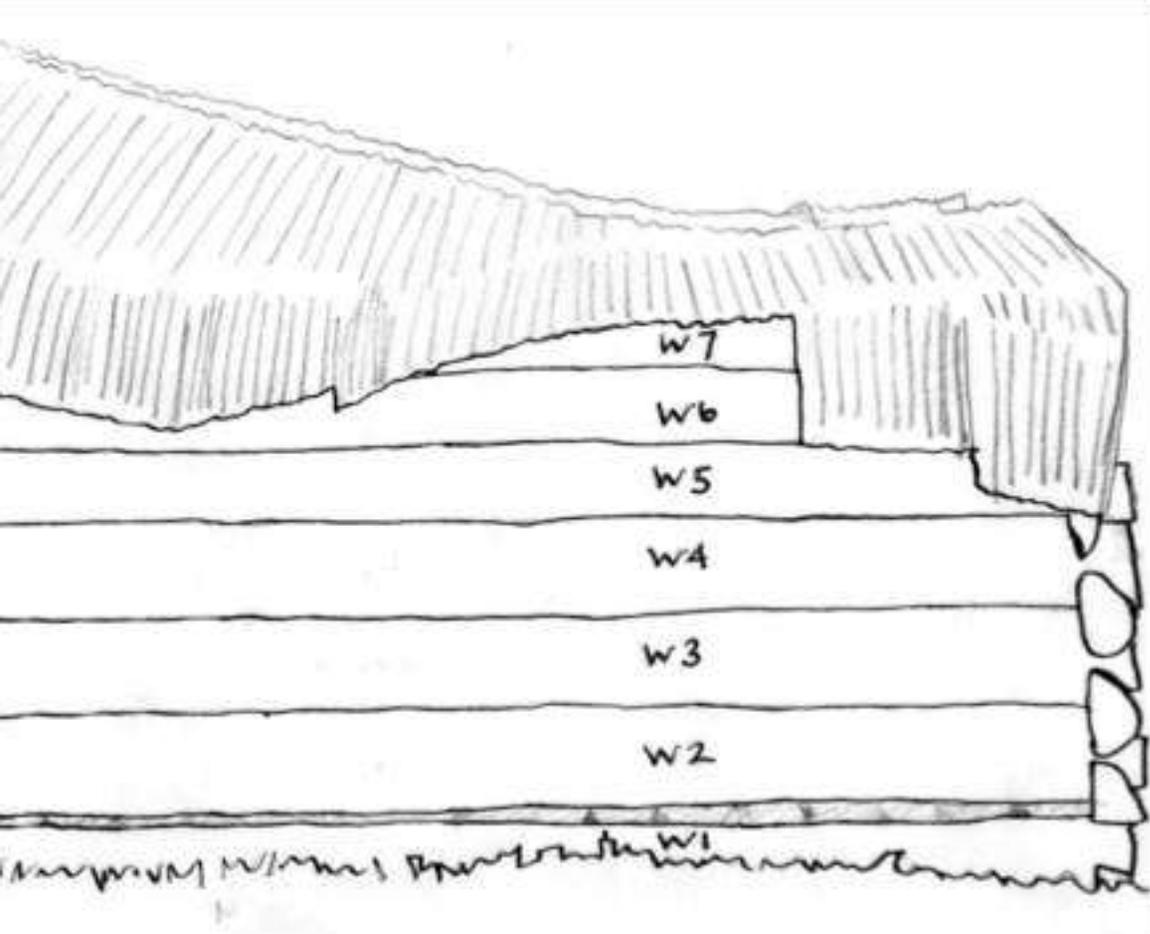
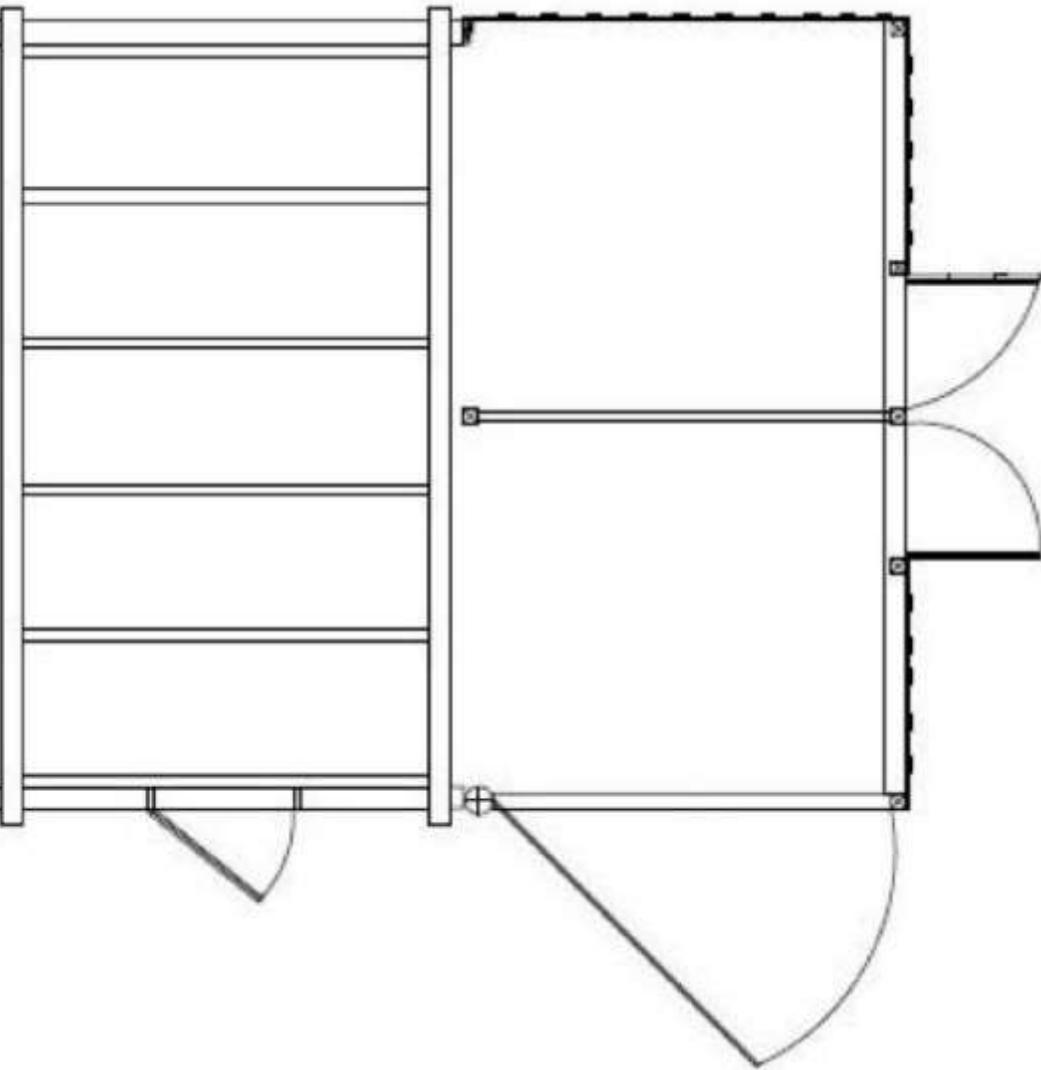


Figure J-17: Rafter conditions of the log crib



Log Conditions



Figure J-18: Crib opening on southern elevation



Figure J-19: Pegged opening and jamb

S1 Some evidence of rot and termite damage, though relatively intact.

End grain looks good.

Some powder post beetle infestation.

Treatment: Repair with epoxy. Apply Boracare.

S2 Some rot, primarily at window opening and along that grain line.

End grain intact.

Evidence of powder post beetle infestation.

Treatment: Repair with epoxy. Apply Boracare.

S3 Composed of one member cut in half to accommodate window opening.

Evidence of high water content, rot, and end grain damage.

Powder post beetle infestation.

Southeast corner has visible section of log missing.

Treatment: Repair with epoxy in bad sections. Apply Boracare.

S4 Composed of one member cut in half to accommodate window opening.

Evidence of high water content, rot, and end grain damage.

Powder post beetle infestation.

Treatment: Replace in kind. Apply Boracare.

S5 Notch cut out of member to accommodate top of window opening.



Figure J-20: Bracket with pegs and holding shutter



Figure J-21: Top plate now resting on Shed Addition roof

Exposure from displaced roof has created inappropriate load at western corner.

Approximately 20-25% rotted.

Treatment: Replace in kind. Apply Boracare.

S6 Top half of log is entirely wet, creating conditions for rot.

Appears otherwise intact.

Treatment: Repair with epoxy. Apply Boracare.

S7 Top half of log is entirely wet, creating conditions for rot.

Appears otherwise intact.

Treatment: Repair with epoxy. Apply Boracare.

Table 2: East Elevation Log Conditions



Figure J-22: Gable on north elevation



Figure J-23: South elevation exhibiting damaged roof and missing gable

E1 (Sill) Badly deteriorated with much termite and insect damage.

Treatment: Replace in kind. Apply Boracare.

E2 Appears in good condition.

Treatment: Repair north end with epoxy or patch. Apply Boracare.

E3 Appears in good condition.

Treatment: Repair end grain with epoxy. Apply Boracare.

E4 Appears in good condition with some end grain rot.

Treatment: Repair end grain damage with epoxy. Apply Boracare.

E5 Appears in good condition with some end grain rot.

Treatment: Repair any end grain damage with epoxy. Apply Boracare.

E6 Appears in good condition with some end grain rot.

Treatment: Repair any end grain damage with epoxy. Apply Boracare.

E7 Appears in good condition with some end grain rot.

Treatment: Repair any end grain damage with epoxy. Apply Boracare.

E8 Top log. Frequently wet because of exposure to the elements.

Some evidence of rot at the end grain.

Treatment: Repair end grains with epoxy. Apply Boracare.

**The East Elevation is obscured from view due to the Shed Addition, but matches the numbering scheme of the West Elevation. Unlike the West Elevation, the East Elevation still retains a top plate, which is partially dislodged from original position.*

Table 3: North Elevation Log Conditions



Figure J-24: Rafters, gusset plates and spaced lath



Figure J-25: Dislodged half-gable vertical siding

N1 Exterior exposed face has considerable termite damage. Approximately 50% deteriorated.

Treatment: Replace in kind. Apply Boracare.

N2 Exterior exposed face has considerable termite damage. Approximately 50% deteriorated.

Treatment: Replace in kind. Apply Boracare.

N3 Exterior exposed face has considerable termite damage. Approximately 50% deteriorated.

Treatment: Replace in kind. Apply Boracare.

N4 Exterior exposed face has considerable termite damage. Approximately 50% deteriorated.

Treatment: Replace in kind. Apply Boracare.

N5 Has most significant termite damage. More than 50% degraded.

Treatment: Replace in kind. Apply Boracare.

N6 Middle of log exhibits termite damage. Notch and end grain appears intact.

Treatment: Repair with Dutchman's patch and epoxy. Apply Boracare.

N7 Good condition. Some evidence of powder post beetle infestation.

End grain appears fair with some splitting at end grain.

Treatment: Repair with Dutchman's patch and epoxy. Apply Boracare.

Table 4: West Elevation Log Conditions



Figure J-26: South elevation gate

W1 (Sill) Resting at grade. Termite damage and rot: approximately 75% deteriorated.

Treatment: Replace in kind. Apply Boracare.

W2 Termite damage on lower half of log; throughout entirety of exterior at mid-span.

Treatment: Repair with Dutchman's patch and epoxy. Apply Boracare.

W3 Termite damage, mostly at southern end: approximately 25% deteriorated.

End grains are intact.

Treatment: Replace in kind. Apply Boracare.

W4 Considerable termite damage at the end grain on north end. Otherwise in good condition.

Treatment: Repair end grain with epoxy. Apply Boracare.

W5 Fungal growth on southern end grain and notched section. Some termite damage at north end grain. Otherwise in good condition.

Treatment: Repair end grain with epoxy. Apply Boracare.

W6 Considerable fungal growth, rot, and termite damage. Approximately 1/3 of log in bad condition, at south end. Notch at southern end is checking, rotted, and about to shear.

Treatment: Repair with Dutchman's patch and epoxy. Apply Boracare.

W7 Protected by roof. Some mold present; some termite damage on north end grain.

Treatment: Repair end grain with epoxy. Apply Boracare.

W8* Top log is no longer present. Fell off due to fallen tree.

Treatment: Replace in kind, using E8 as example. Apply Boracare.

Table 5: Rafter Conditions of Log Crib

R1 Extremely wet. Wet rot. Broken at ridge.

Treatment: Replace in kind with respect to size and species. Apply Boracare.

R2 Broken at ridge.

Treatment: Replace in kind with respect to size and species. Apply Boracare.

R3 Broken at ridge.

Treatment: Replace in kind with respect to size and species. Apply Boracare.

R4 Appear in good condition. No evident shear or rot.

Treatment: Examine tops once roof removed. Treat with Boracare.

R5 Appear in good condition. No evident shear or rot.

Treatment: Examine tops once roof removed. Treat with Boracare.

R6 Appear in good condition. No evident shear or rot.

Treatment: Examine tops once roof removed. Treat with Boracare.

k. the feed house





Figure K-1: Floor Plan



Figure K-2: North Elevation

General Description

The Feed House (Figures K-1 through K-5) was built c.1900 and was used for the storage of feed. Its name is taken from the Shields-Ethridge Farm National Register Nomination from 1992, where it is listed as a contributing structure. It is a rectangular structure roughly 11' x 17'2." The Feed House has two doorways, one each on the east and west sides. The east bay has been closed off by nailed scrap pieces of wood across the opening; therefore, the west doorway provides the only current point of entry.

Existing Conditions

Foundation and Floor System

The shed has a foundation of fieldstone piers (Figure K-10), one pier located at each of the four corners and one mid-span on the north and south sides. Larger stones are placed at the ground level and act as footings for the piers. Smaller fieldstones are then stacked vertically to form 18" piers. The fieldstone was bound together with a thin layer of mortar of mostly clay and local sand with a limited amount of lime, which is evident in various layers of the pier.

Bearing on the foundation piers are large, hand hewn sills measuring approximately 9" x 9" (Figure K-11). The sills appear to be connected with mortise and tenon joints; however, it is very difficult to see the sill-to-sill connection without removing the floorboards above or siding around it. Each sill is heavily damaged by termites and rot. A large, hand-hewn center girder, measuring 12" x 14" runs the length of the structure roughly halfway between the north and south walls. It does not connect to the sill and is deeply checked and shows rot. The girder does not appear to be original. There are notches in the sill what can be seen underneath the structure. These empty notches indicate where floor joists were located at one point (Figure K-12). Originally there were four floor joists. The two center joists have now been replaced by the large girder. Between the sills, on either side of the girder, are two extant floor joists, which run the length of the structure, east to west. These joists measure 4" x 6" and are sash sawn. The joists do not appear notched but seem to butt up to the sill on the west side. One

the east side, the joists are cut 2' from the sill, with 2" x 6"s sistered to the cut end and connecting to the sill with toenails. Seventeen



Figure K-3: East elevation



Figure K-4: South elevation

circular sawn floorboards, each measuring 1" x 12", are nailed perpendicularly into the joists and the sills using cut nails. The floor joists are in good condition.

Exterior/Wall System

Large, circularly sawn 4" x 6" posts bear upon the sills at each corner. 2" x 2 1/2" studs are unevenly spaced between the corner posts, at an average spacing of 4' on center. The corner posts are braced with diagonal knee bracing toe-nailed into the corner post at the top and the floorboards at the bottom. The corner posts, studs, and corner braces are notched roughly 3'3" from the floorboards to receive 2" x 3" girts (Figure K-13). This type of framing is known as "boxed framing," which is an inexpensive way to frame using a sill, girt and plate. The exterior is composed of vertical, 1" x 12" circular sawn, pine board siding. There are no interior finishes. A double top plate composed of two 2" x 3"s complete the wall system (Figure K-9). The south elevation has an 18" high opening, used to provide ventilation to the interior, running the length of the wall between the top plate and the top of the exterior sheathing (Figure K-14). The siding on the south elevation is in fair condition. The siding on the north elevation is in good condition. The bottoms of the siding boards have minimal damage from termites and water. There are two door openings, one each on the east and west elevations. The east door opening has been closed off by scrap pieces of wood nailed across the opening. A single wrought iron strap hinge indicates that the door once functioned. The siding on the east façade is in fair condition, with some termite damage and fungal growth. There is new fungal growth on the northwest side of the east façade. The west doorway provides the only current point of entry. The board and batten door is in fair condition, with some fungal growth present.

Roof System

The ceiling joists are small de-barked logs that range in size from 3 1/2" to 5" in diameter (Figure K-13). These joists bear on the



Figure K-5: West elevation



Figure K-6: Site Plan

top plate and are notched in place, with approximately a 1 ft. overhang (Figure K-14). 1" x 12" circularly sawn planks rest on top of the ceiling joist overhang and serve as a false plate for the rafters above (Figure K-15). The rafters are also small de-barked logs and are more uniformly sized at roughly 3 1/2" in diameter. The rafters meet at the ridge and are toe-nailed together. A spaced lath of non-uniformly sized boards is nailed into the rafters. The roof is finished with a 5-V crimp galvanized steel which is face-nailed to the sheathing with lead-headed nails. Scattered nails in the spaced lath indicate that the roof once had a wood shingle finish (Figure K-16). The current metal roof has been patched and repaired poorly. Because these patches have been made up of various roof pieces and materials, the roof is not watertight. The rafter tails on the north side are enclosed with a 1" x 12" and a 1/2" x 6" beam. The rafter tails on the south side are not currently enclosed, but may have been enclosed at one point in time in the same manner as the north side.

Recommendations

The recommendation for the treatment of the shed is one of preservation. As a vernacular farm structure, these recommendations aim to preserve as much of the historic fabric and design intent as possible. For this reason, all treatments should aim to stabilize, maintain and prevent further deterioration of the structure.

The foundation's stability should be reinforced by replacing any fieldstones that have shifted out of position or are missing. Each pier should be inspected and repointed with a thin, discrete layer of mortar. The repointing should maintain the appearance of dry stack.

The greatest level of intervention is necessary to address the compromised sills and floor joists. To address these problems, the

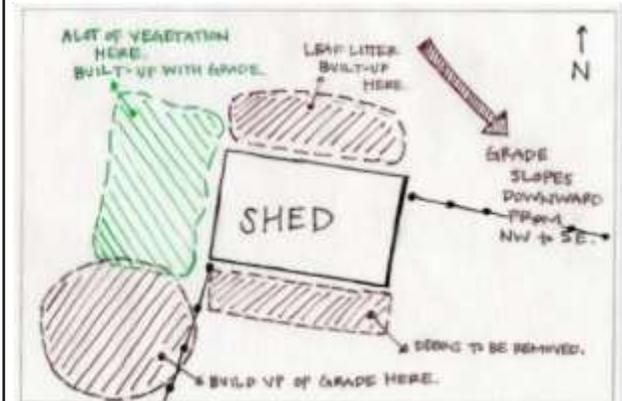


Figure K-7: Detailed Site Plan

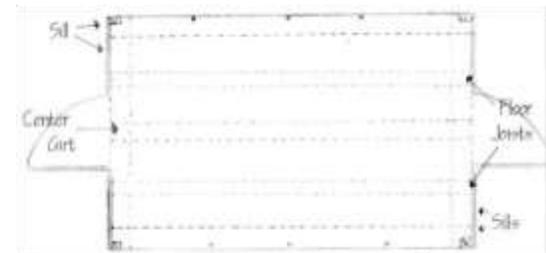


Figure K-8: Floor Structure Plan



Figure K-9: Top Plates

floor structure should be inspected by removing the floorboards. In this removal, all historic fabric should be retained and numbered so that it can be reapplied in its original position. Each floorboard should be inspected before being returned. Only the floorboards that are structurally damaged should be replaced, with the others preserved. The center girder is in poor condition; it should be replaced with in kind materials that are the same species and size. Damaged sections of the sills and joists should be epoxied or replaced depending on the severity of deterioration. If replaced, the sills, joists and floorboards should all be replaced with in kind materials that are the same species and size. Because the floor joists appear to be altered from original attachment method, these should be reinforced in some manner. After sills and joists have been assessed for damage, the site under the structure should be excavated and cleared of debris to lower the grade, allowing for greater distance between floor structure and the ground. Supporting elements may need to be introduced under the center sill to get it off the ground and prevent further insect or water damage.

The ceiling joists should be epoxied at their ends where they are allowing water and insects to damage and compromise the joists. A clear epoxy would be appropriate to prevent water from wicking in on joists that are in need of maintenance. For the joists that have rotted, they should be filled with epoxy filler. Once epoxied, the epoxy filler should be stained to look aged and blend with the extant joists.

Barring any extreme deterioration that could potentially compromise the structure, all vertical sheathing should remain in place. On the south elevation the siding should be treated for fungal growth and to prevent further insect damage. Siding pieces that are missing should be replaced in kind, with the same species and size. On the north elevation the siding is in good condition. The bottom ends of the vertical boards are compromised by water and insects and should be epoxied to prevent further damage. On the east elevation the siding should be treated for fungal growth and to prevent further insect damage. Siding pieces that are missing should be replaced in kind, with the same species and size. The closed off door entry can be left as is. If restored to its original function, the door hardware should be replaced in kind or a bottom hinge found to match the original historic upper hinge. On the west elevation, the siding should be treated for fungal growth and to prevent further insect damage. Siding pieces that must be removed due to termite damage should be replaced in kind, with the same species and size. The door is in good condition, and only the northern most board on the door need to be replaced due to termite damage and rot. The door hardware is rusted, but functional.

The entire structure should be cleaned of debris and discarded farm materials. After the restoration, some farm materials can be placed back into the structure for interpretation.

The rafters and spaced lath are in acceptable condition and should be maintained. The roof should be restored with wood shingles. Until the roof can be fully restored, the current metal roof should be patched prevent further water damage.



Figure K-10: Fieldstone foundation pier



Figure K-11: Damaged sill



Figure K-12: Original joist notch in sill



Figure K-13: Vent Opening

Additional Photographs



Figure K-13: Joists



Figure K-15: Joists Overhang



Figure K-14: False Plate



Figure K-16: Nails in Spaced Lath Indicating Wood Shingles

1. two stall barn



Introduction



Figure L-1: Shed doors: Left door needs replacement



Figure L-2: Ladder leading to the loft

This small wooden structure was used to house mules or perhaps as a birthing stall for large animals. The structure is 16'2" x 9'9" and has two doorways on the east side, which together measure 6' 2 3/4" x 6' 5/8." There are two open windows at the top of each side gable, located on the north and south elevations, measuring 2'9 1/8" x 2.' The structure is located inside the pony pen behind the Mule Barn on the west side of the property beside the fenced area for cattle. Small vegetation surrounds each elevation and a large tree growing against the south elevation is a major threat to the building.

Foundation

The shed has a foundation of fieldstones and no floor. Larger stones are placed at the corners of the structure for stability. Grade poses a threat to the building as water has eroded the foundation and ground away on the east elevation.

Walls

The walls are constructed of clapboards measuring 20' x 4 1/2" and are 3/4" thick. Most boards are in good condition except those on the south side that are being warped due to the large tree growing up against the shed. These will need to be replaced during reconstruction. The left batton door on the eastern facade is in bad condition and needs to be replaced. The right door is in good condition and can be reused in the shed's reconstruction.

Roof

The roof structure consists of nine 6'4 3/4" wooden rafters resting on a top plate by use of half-dovetail cuts. These rafters are toe-nailed to the wall studs and extend outwards from the wall 1'4 3/4" to create the roof overhang. Rafters are 23 1/2" on center and in good condition. The 5V tin roof is in good condition and should be used in the shed's reconstruction. Like the boards used in the shed's exterior siding, sections of the roof should be numbered and assembled correctly in the shed's reconstruction. Also, all wall studs and rafters should be numbered and reassembled accordingly.

Interior

The shed's interior is in good condition. There are several feeding troughs and a central separating the two stalls. A loft can be accessed by ladder and air flows into the structure through the two venting windows located at the top of the north and south walls.

Recommendations

The shed is in poor condition due to a tree growing on the south side, therefore warping structure. Also, water damage due to grade problems on the north and east facades, as well the foundation, make it necessary to rebuild the structure at another location. Approximately 30 percent of the siding boards need replacement due to rot and powder beetles. More damage to the wood siding can be found towards the foundation where rising damp has caused the wooden boards to rot and invited more insect damage. Boards can be repaired / treated with epoxy should be preserved and used to rebuild the shed. Boards, rafters, and all parts of the roof structure should be numbered so that the shed can be put back together in the same way as it was originally built, therefore retaining as much historic integrity as possible. The roof structure should be preserved and used in the shed's reconstruction. Refer to measured drawings for accurate reconstruction.



Figure L-3: Fence dividing the two stalls



Figure L-4: Interior feeding troughs

fence

the
as to

post

that

be



North shed measured drawings

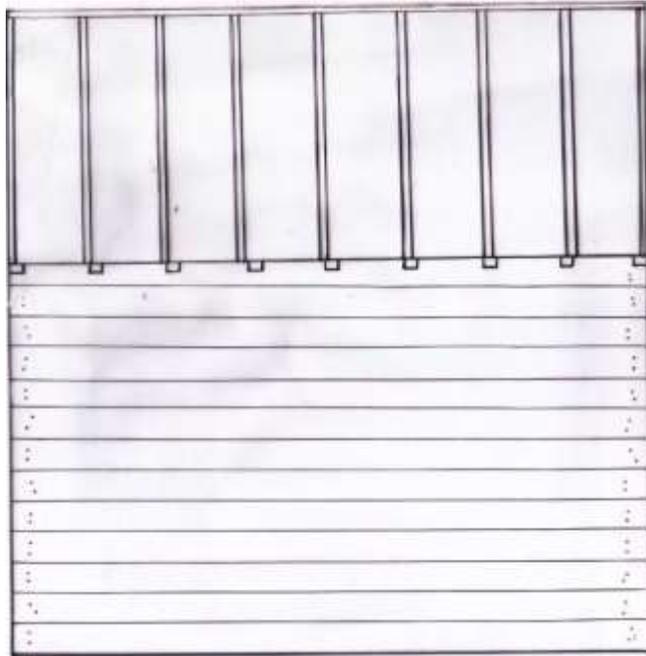
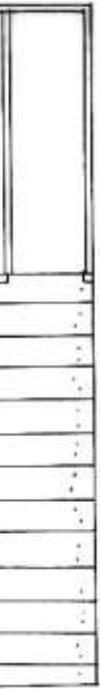
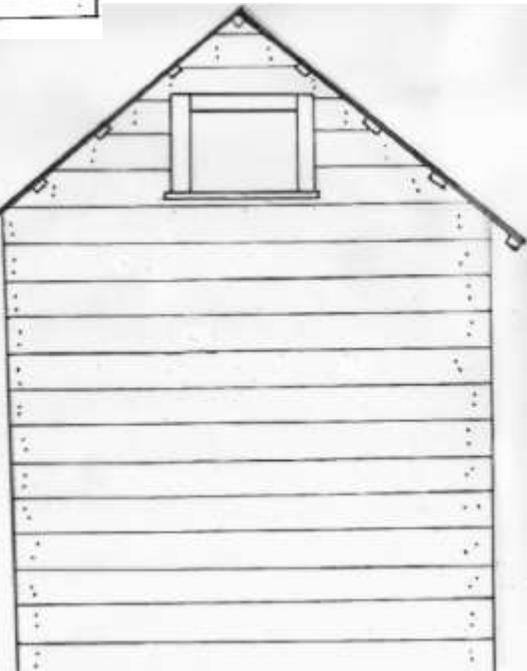


Figure L-7: West facade



m. milking barn



Structure Evolution



Figure M-1: East elevation



Figure M-2: West elevation

The Milking Barn, built about 1900, is a wood frame structure originally used to house cattle. It consists of two parts: a 40' by 15'6" main barn with cattle stalls, and a 14' addition on the east side. There is an entrance in the center of the east elevation on the addition, which is protected under a shed roof supported by rough, branch-like posts similar to those used on the School-Teacher's House porch. There are also two entrances on the west elevation. Each of these two entrances is composed of three vertical wooden planks measuring between 10 and 12 inches and attached to the structure with wrought iron hinges. The doors open outward, with the hinges on the side of the door closest to the structure's corners. Each door has a wooden clasp that turns in place to keep it closed. The exterior walls of the structure are composed of wide wooden planks of nonuniform size, but generally about 8" wide and 1" thick. The southern elevation also has several hinged boards, which utilize the same wrought iron hinges as the doors on the east elevation. The hinges on the south elevation are arranged in a vertical fashion, rather than a horizontal one, to allow the planks to open in an up-and-down fashion, most likely for the purpose of feeding cattle. The interior walls are simple 2" x 4" studs that are completely exposed and that the exterior planks have been nailed to. Approximately every other 2" x 4" has been sistered with another, shorter 2" x 4" that does not reach up to the height of the top plate. The spacing between studs is inconsistent, but in general is 24" on center.

The roof on the original section is composed of a corrugated steel, while the addition, including the shed roof, utilizes 5-V crimped steel. The rafters are 2" x 4"s. Like the studs, the spacing is not completely consistent, but is approximately 24" on center.

There are no floor boards of any kind, and given that the structure was historically used for the purpose of housing cattle, this is likely the way it was originally built.

The interior of the structure has 4' side aisles along the outside walls, with stalls down the middle. The materials used to construct the interior aisles and stalls are inconsistent, perhaps because of replacements over time. But it is also possible that, given the nature of the structure's use and the presence of other general inconsistencies in construction, it was not consistent to begin with.

The structure has settled to a point where it is now directly on grade, although there is limited evidence that its original construction was

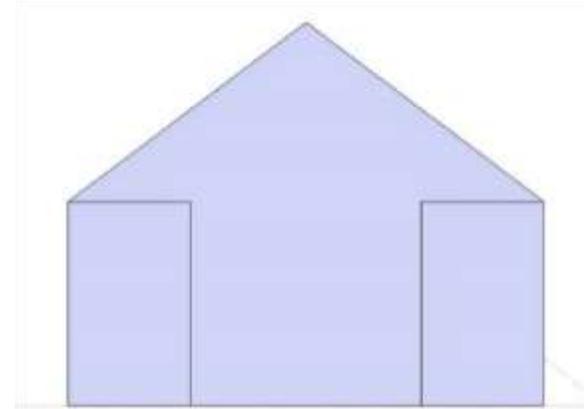


Figure M-3: Cross section of the Cattle Barn



Figure M-4: Floor plan of the Cattle Barn; the lighter portion is the original structure and the darker portion is the addition

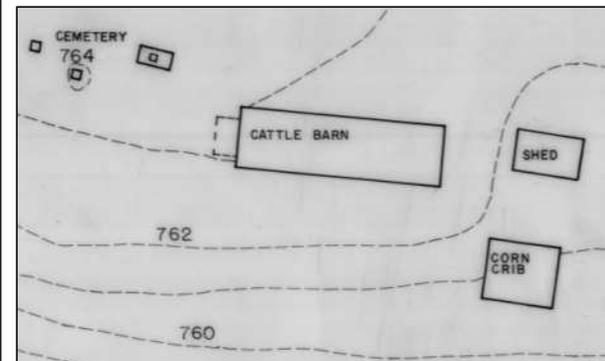


Figure M-5: Site Plan

most likely on piers. There were some loose field stones and concrete block units remaining on the east elevation, as well as the remnants of some loose stones on the north elevation. Some of the sill plates have been replaced relatively recently with what appears to be salvaged materials, but the underlying foundation issues were not addressed.

Presently the structure is being used to house salvaged materials, primarily wood and sheet metal. These materials are stacked up five to six feet throughout the cattle stalls in the original portion of the structure, and several feet in the addition as well.

Existing Conditions

There is significant insect damage, primarily powder post beetles, on much of the structure. The most damaged portion is the bottom plank on the north elevation, especially at the northwestern corner, which has also suffered severe termite damage. The salvaged wood being stored within the structure also shows evidence of both termite and powder post beetle infestation.

The south elevation has suffered from sun exposure, and many of the boards on this side of the structure have warped, curled, and pulled away from the structure. This is particularly true near the center of the elevation.

Because the structure is on grade, as the ground and structure have settled, and grade has built up or washed out from decayed organic material and activity patterns, the structure has become severely racked, tearing apart portions. A number of the rafters on the southern side of the structure have separated from the structure, particularly toward the center of the structure. As a result, the roof has bowed in the center of the structure.

The perimeter of the structure is severely overgrown, which has made access to parts of the structure impossible. This has also resulted in a buildup of decayed organic material around the structure, which has facilitated moisture and insect infiltration. Some plants are even penetrating and growing inside the structure.

Recommendations



Figure M-6: Interior of the Cattle Barn showing the aisles for moving cattle in and out of the interior stall



Figure M-7: Interior beams pulling away from the top plate or the structure on the southern side

The top priority in maintaining this structure is the removal of all materials being stored inside. Currently, the barn is packed with a large quantity of wood and sheet metal salvaged from other historic structures. The intent of storing this material was most likely to have them on hand for future repairs to structures on the Shields Ethridge site. However, much of the material being stored in here suffers from insect and rot damage and would not be appropriate for such a use. Instead, the material should be removed and disposed of. The presence of these materials has made access to parts of the structure difficult, rendering most of the necessary repairs impossible. Additionally it is attractive to insects and contributes to moisture retention within the structure. All plants, including overhanging tree branches, must be cleared from the perimeter of the structure, particularly on the southern side of the structure. The general recommendation for all structures on the site is to remove any trees within ten feet of any structure. The farm equipment around the structure is also contributing to the pooling of water around the structure on the north elevation and should be relocated to allow for routine and major maintenance activities. A drainage swale must be installed so that water flows away from the structure. Once these measures are taken, a more thorough evaluation of the foundation of the structure can be done.

Like all the other wooden structures at the site, this structure needs to be treated for insects. The sill plate on the north elevation, as well as the bottom board on this elevation, have suffered from termite damage and are in need of replacing. But before replacing the sill, the general foundation issues should be addressed.

Serious intervention is necessary to correct the deficient foundation. It has been undermined, resulting in severe structural issues. The



Figure M-8: Example of plants growing in and around the structure, as well as insect damage



Figure M-9: Various materials being stored in the Cattle Barn at the moment, including posts and sheet roofing material

major issue to address is the leaning, which has occurred. The first priority is to move the walls closer to plumb and level. To do this, a foundation must be installed. A likely course of action is numbering and disassembling the walls. The siding will probably have to be removed to allow for realignment of the structural members. While the walls are removed, temporary bracing must be installed to hold up the roof. Removing the siding from the walls will give the opportunity for thorough evaluation of each board to assess the level of warping from sun damage, insect damage, and any other types of deterioration. Where possible, all original siding should be placed back on the structure. In cases where the damage is too severe to use the original boards, appropriate replacement materials should be used.

A plan should also be put in place to monitor the level of damage to these boards, as sun damage is likely to continue in the future and could lead to more warping of boards. As boards reach a level that could be detrimental to the overall integrity of the structure, they should be replaced. Once the walls have been returned to their original locations, the roof can be repaired. While no preference is given to which material currently being used for roofing is used for the replacement of the roof, the material used should be uniform across the whole structure. Both corrugated sheet metal and 5-V crimped roofing are designed to lock into place in order to be more effective at keeping moisture out, so the current use of both these materials together is not ideal. After all of this is done, the entire structure should be raised and a new foundation can be put in place. As evidence shows that the original foundation was most likely piers, we would recommend installing piers again, but with an adequate footing to support the weight of the structure.

n. the warehouse





exterior clapboards; need
replacement

General Description

The Warehouse's exact date of construction is unknown, but presumably it was constructed during the same time period as the rest of the farm buildings (c. 1900-1920s). Used to store the farm's larger equipment, this large, rectangular, wood-frame structure is centrally located on the property and faces east, with large doors to both east and west. It has a substantial gabled roof with the ridge running east and west, covered with corrugated galvanized steel roofing. Along the north and south sides are shed roofed extensions also used to shelter farm equipment. That on the north side appears to be original to the building, while the one on the south appears

to be an addition (or possibly a replacement for an original portion in this location). The grade on the north side of the building sloping away, wagons and other equipment can be driven into the north addition. Only material and smaller tools and equipment can be stored on the south side where the grade is higher. The south addition is supported by 12 wood posts on concrete block foundation piers and has a five-V tin roof. The older north extension is supported by four posts of different sizes; three of which are new and resting on field stones and one original one that needs replacement and which is also resting on field stones.

The main structure is symmetrical and uses consistent materials throughout, with sliding metal doors on the east and west elevations. The interior has a dirt floor center bay with two concrete floor side bays. Four posts are located in the center of the interior that support a loft. Wall studs measure between 2"- 2 ½" x 4" and are placed 24" on center. There are also irregularly placed large 4" x 4" studs added for extra strength around all four walls. Corner studs measure 4" x 4" and walls sills measure 3" x 9".

Exterior

Grade

The high grade on the south side of the Warehouse poses the greatest threat to the building because water currently flows towards



Figure N-2: Rotting rafters on the east facade



Figure N-3: Windows are in good condition

the structure, causing damage to the concrete floor inside, the foundation, and the wood siding. A tree at the southeast corner exacerbates the problem. This tree is reaching the end of its life and dropping branches on the roof. The tree poses a threat of causing significant damage to the building if not removed, and has already been the cause of some of the water issues on that side of the Warehouse. The tree should be cut down and a swale graded around the exterior south wall with an “arm” extending away from the structure to direct water outwards.

Roof

The warehouse needs a new roof as holes in the roof are currently allowing water to seep in and rot the wooden rafters and walls. There is also significant termite damage to the rafters on the west end of the roof structure. A new roof, along with a swale to direct water away from the building on the ground, will help prevent the water damage from getting any worse.

North Elevation

The north elevation shows some repair work on the west end, with new wooden posts that support a new five-V tin roof. The west end of the extension has new 2” x 6” rafters that are placed 20” on center and are in good condition. The only concern in this area is the wooden siding located near the ground which is showing signs of weathering and some rot. These boards should be replaced.

The east end of the north elevation is in poor condition. The corrugated tin roof, wooden rafters, siding, and posts are deteriorating and in need of repair. The corner stud on this side is a high priority as the roof is caving in. The rafters are significantly damaged by rot, evident by the algae and mold growth. A new ledger should be put in place as was done to the west.

East Elevation

Overall, this elevation is in good condition except for some damage (due to rising damp) on the foundation at the south side. This can easily be repaired with stucco. Also, the metal sliding door needs replacement as it has deteriorated due to weather.

South Elevation



Figure N-4: View of the interior on the eastern side



Figure N-5: Cracking and eroding concrete floor

This elevation's walls are in fair condition with some rot (more evident in the interior; refer to Interior South Wall). The extension's five-V tin roof is in poor condition.

Washers on the face nails are coming loose, and sections of the tin are detaching. Debris from two trees covers the roof, causing damage and water leaks. The roof needs replacement. As with the east elevation, the grade poses a problem because storm water currently flows towards the structure and causes damage. The recommended swale should address this issue. Also, it is recommended that leaves and debris be kept removed from the roof and ground surrounding this and all elevations.

West Elevation

On the west wall, the following boards need replacement: 1) the bottom-most board near the northeast corner; and 2) several boards above the sliding metal doors that are warping and pulling away from the wall. Also, the upper window sash is damaged by rot and/or chewing by animals, but this can be repaired with epoxy. The sliding metal doors are in good condition.

Interior

Floor

The two side bays of the warehouse have a concrete floor, while the center drive is earthen. The southwest corner's concrete floor has eroded both due to holes in the roof allowing water to leak onto the floor and rising damp. This should be monitored and later patches in the floor will most likely be necessary. If a swale is put in place to direct water away from the building, less damage to the walls and floor will occur.

Walls

The north wall is in fair condition. There are certain spots that are experiencing water damage, mainly due to holes in the roof.



Figure N-6: Indication of rot on the south wall.



Figure N-7: Iron jacking in base of northeast and southwest piers

The east end of the wall is leaning to the north with some boards beginning to rot (again due to water leaking through the roof onto the boards and causing mold to grow on the lath). Also, boards located towards the ground are somewhat rotted due to rising damp. A new roof would solve many of the water issues.

The west wall's biggest threat is water damage. The northwest corner has major water damage due to holes in the roof.

The south wall is experiencing some termite damage, especially on the west end where it is made worse by water infiltration. The eastern corner's floor is also very wet due to rising damp. Occurring approximately mid-wall, one of the 6" x 4" double studs is badly eaten by termites and needs replacement. Also, the lath and junction between the original and extension roofs have deteriorated due to water seeping in between the two roof sections. There is also significant termite damage towards the west end of the wall and on the bottom sill. As long as the sill is kept dry and monitored it does not need replacement.

The east wall is in good condition. However, there is some efflorescence on the north end which will probably disappear with a new roof and grading outside but should be monitored.

Piers

Both the southeast and southwest wooden posts have checking but are in good condition. Both also have mold growth and some efflorescence on the foundation piers, but neither is in need of replacement. They should be monitored as these signs indicate the beginning of deterioration.

The northeast and northwest wooden posts supporting the loft have some checking, but are in good condition. However, their

foundation piers are in poor condition. They are concrete, with the large aggregate typical elsewhere on the farm and are crumbling due to age and iron jacking. The jacking comes from the rusting of an iron pipe that was used to center the piers and around which the piers were formed. The piers need to be replaced. Both posts should be jacked up and supported by struts and then reset into solid concrete blocks with a stucco covering. Under the block piers new concrete footings should be wider than the originals to better spread the load.

Loft

The small loft, occupying the center ninth of the interior, is supported by the four posts just described. It is constructed of 2" x 6" joists that are placed 2' on center. Note that there is on rotten board at the center towards the east end that should be replaced. This rot is due to holes in the roof above, allowing water to seep in.

Recommendations



1. Install perimeter drainage system on the south side to catch water dripping from the roof and carry it off to the north east. A similar pipe could be installed on the north side though here grade allows water to run off naturally without damage to the building except for a trough in the earth below the drip line. See Figure A-10.
2. Remove tree at southeast corner of building.
3. Install new roofs on all portions of building; either a 5V or corrugated metal would be appropriate.
4. Replace remaining original deteriorated post on south addition.
5. Replace deteriorated siding near bottom of north wall.
6. Replace metal sliding door on east elevation.
7. Replace deteriorated boards on west elevation.
8. Repair termite damage to rafters on west end.
9. Replace rotted stud, posts, ledger, and splice in new rafter ends at east end of north elevation.
10. Replace 6" x 4" double stud mid-wall on south wall.
11. Replace concrete interior pier foundations holding loft supports.
12. Replace rotted board in loft floor.

o. the teacher's house



Building Evolution



Figure O-1: West elevation



figure O-2: South elevation

The building is a single-story wood frame house constructed in 1912 and sheathed in clapboard. It is front-gabled with an addition to the eastern elevation, forming an L shaped plan. The structure sits on a pier foundation, most piers being composed of loose stone, but some of which are concrete block. There is an entry porch on the north elevation. The porch has a shed roof composed of 5-V crimped sheet metal. The deck is composed of modern, pressure-treated lumber, indicating that this is a replacement porch. It is supported on modern concrete masonry units. The current posts are also replacements, as is evidenced by ghost marks left by the original posts, which were simple 2" x 4"s.

The bedroom addition is built off the kitchen on the eastern side of the original structure. The addition also has a shed roof porch with a 5-V crimped sheet metal roof. This porch is supported by a post elevated on a circular modern concrete masonry unit, and does not have a raised floor. Instead, the floor of the porch is composed of bricks laid directly on the ground. The rafters on the addition's porch are double toenailed into the siding, and the roof rests on a top plate. The porch end is faced with beaded boards. There is a separate entrance for the bedroom addition. The door appears to be original, or at least very old. It is worth investigating why this door exists at all, since it opens directly into a bedroom. The door casing is made of salvaged flooring. A screened door was added at a later date, and to accommodate its presence, a notch was cut into one of the shed roofing rafters to allow the door to open. Where this notch has been cut, the rafter is less than 1" thick, severely weakening it.

The roof on the original portion is constructed with 2" x 4" rafters, 32" on center with an 8' span. Ceiling joists are 2" x 6"s, 32"



Figure O-3: East elevation

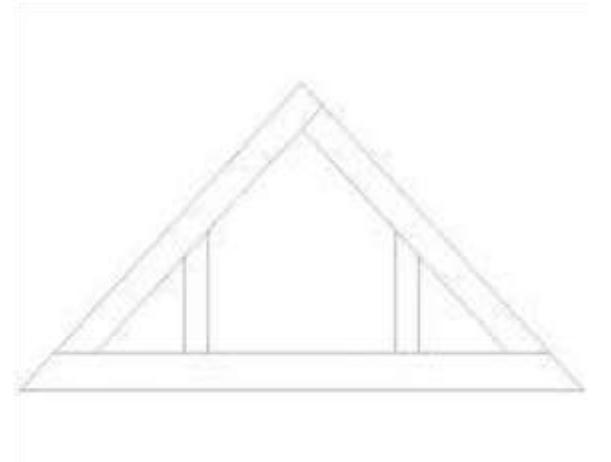


Figure O-4: Illustration of the method of bracing used in the attic of the original portion of the School Teacher's House

on center. There is no ridge plate. The rafters are nailed directly to the joists, laying against the top plate, rather than having a more secure connection. There are two braces, composed of 1" x 6"s, 6'6" high, and positioned as an informal type of a queen post truss. The roof is 5-V crimped sheet metal, but judging from the spaced lath and the presence of old shingles in the attic, was originally wood shingled, at least on the original part of the house. Full dimension plate to plate is 16', giving a span of 8'. The attic to the addition was not fully accessible, and so it could not be measured and evaluated at length. But spacing of rafters and materials used appear to be similar to those used in the original portion of the house.

The floors of the original portion of the structure are constructed of 2" x 6"s, roughly 24" on center, though the vernacular nature of the construction allows for some spacing as far apart as 27" on center or as narrow as 23" on center. The joists have a 16' span. In several areas under the house, the flooring has been braced with boards that the joists are toe-nailed into as a form of reinforcement. It was not possible to examine the flooring system of the addition.

There is a chimney on the northern elevation of the original portion of the structure. It is composed of rough stone at base, brick in the center portion, and historic concrete masonry units like those used in the construction of the gin and other buildings on the site above the roof line. At some point in time Portland Cement repointing of the chimney has taken place.

The windows throughout the house are inconsistent. It appears that the house originally had few windows and more were added later, possibly at the time the house received an addition. Several of the windows are composed of incompatible parts, such as using two top sashes in place of a top and bottom sash, and several of the windows also have utilized salvaged flooring for casings. Conditions of the windows will be discussed in further detail below.

The original purpose of the structure was to house a tenant farmer and his family. Later, the teacher for the schoolhouse associated with the site lived there, hence the name. The structure currently houses several pieces of furniture and other artifacts, which are being used for interpretive purposes.

Existing Conditions

The construction of the bedroom addition has caused several problems. At the point of the connection, water and insect damage due to poor connection is visible. The flow of water from the main roof onto the shed roof of the addition's porch flows directly back onto the eastern wall of the original building, and there is rot and mold damage as a consequence of this. The grade level is higher around the addition than the original



Figure O-6: Water damage from the flow of water off the shed roof of the addition can be clearly seen on the western facade of the original structure

house, which has also conducted moisture to the original building, resulting in further rot and fungus. The addition has made access to the eastern wall of the original building difficult.

The bottom two to three clapboards around the entire structure have been replaced in the past, probably due to rot issues. However, the problems causing these rot issues - the grade around the structure, built up plant and dead organic material, poor flashing, and splash back - have not been addressed so these bottom boards are again retaining moisture and suffering from various levels of rot. This is evident around the entire structure, but is most prevalent at the site where the addition meets with the

The main door is composed of vertical, unpainted boards and has had a horizontally aligned window cut into it, probably so that visitors can see the artifacts inside. The alteration of the door to include this window has adversely affected its authenticity and the structural integrity of the door. Additionally, water is soaking into the end grain at the top of the vertical boards as a result of the lack of roof flashing at the connection of the porch shed roof and the main roof.

The windows throughout the structure are inconsistent in construction and are at varying levels of disrepair. It is uncertain which windows are original and which are added. In general the windows follow two basic layouts, either a six over six configurations, or a more narrow but taller four over four configurations. All of the windows have red painted frames. Several windows are composed of incompatible parts, such as two top sashes in place of a top and a bottom sash. The north elevation has a single window, to the left of the front entrance, in

original structure. At the juncture of the south and west elevations, the corner sheathing has been shortened due to rot damage.

Some of the exposed rafter tails, particularly on the western elevation, are deteriorating due to water damage and rot, namely the fourth and sixth from the north end of the building. The wall below these rafters also shows water stains above the southernmost window on the eastern elevation, and there is a corresponding stain on the interior ceiling and wall of the building. The western wall also shows inactive powder post beetle infestation on the seventh, eighth, and ninth clapboards from the bottom.

The interior also shows evidence of a powder post beetle infestation as well as an active termite infestation. The termites seem to be coming in from the outside through a rotting sill beam that is in contact with the ground, and larvae were noted within the doorframe between the bedroom and kitchen. The source of the powder post beetles is unclear, although the infestation is most extensive in the bedroom. There is evidence that the powder post beetles are also affecting wooden furniture within the house. When addressing treatment of the building, it will also be necessary to treat any wooden and cloth artifacts within the structure.

The main porch construction is generally deficient. The porch is simply toenailed into the siding of the building and is pulling away. The east end is barely attached at all. Vertical posts against the siding do not extend for the full height and instead bear their weight on the siding. The roof is not flashed to the siding at all; which has led to staining of the clapboards and potential rot issues.

the four over four light configurations. This window is, generally, in good condition and has not suffered the same level of deterioration that some of the other windows have. All the other windows suffer from some level of rot. The west elevation has two windows, the first of which is in the six over six light configurations and the second of which is in the four over four light configurations. The four over four window on the west elevation sits under the rotting rafter tails along that elevation, and there is water damage evident on both the exterior and interior wall above this window, some of which has seeped into the upper portion of the frame in the interior. This window has two top sashes. There is one window on the south elevation of the original portion of the structure. This window follows the six over six configurations and is in poor condition. The south elevation of the addition also has a window, this one being of the four over four light configurations. There is a



Figure O-7: Examples of the deterioration of the lower portion of the addition on the house due to grade, built up organic matter and other moisture issues; there is a significant amount of rot on the lower boards all the way around the structure

six over six window on the east elevation of the addition as well. This window is composed of two bottom sashes, and the uppermost right



Figure O-8: Active termite infestation in the interior of the house, at the door frame from the kitchen to the bedroom addition



Figure O-9: Detail of the poor construction of the porch, offering no support and pulling away from the structure

light has been broken out.

The entire chimney is pulling away from the front of the house, allowing water to seep behind it and creating a potential for water, rot, and insect damage. Repointing has previously occurred with Portland Cement, and some stones are suffering and crumbling as a consequence of this.

The eastern sill plate is partially missing, leaving the exterior wall on the eastern elevation of the original building unsupported and resting against the ground.

There is serious rust damage at the south elevation connection of the original building to the addition, and the rafters below the roof at this point are suffering from rot and moisture damage.

Recommendations

The single story wood frame structure has had multiple alterations, including an addition, alterations to the chimney, replacement of wood shingle roof with 5-V crimped sheet metal roofing, and the insertion of a window into the historic front door. The structure is suffering greatly from water damage and related issues and currently has both powder post and termite infestations. Major corrective repairs need to be taken with the front porch and chimney, which are both slipping away from the house as a consequence of settling and insufficient footing to support the structure. Any future repointing of the chimney should be done with a historic lime-based mortar, rather than Portland Cement, in order to avoid further cracking of masonry. The roof also needs to undergo major repair due to poor flashing, which is causing water seepage between the chimney and the main building. Correcting the leakage problems along the south elevation at the point of connection with the addition should be a priority in order to ensure that moisture damage does not escalate further. In the restoration of the roof, depending on the period of restoration and pending evidence of wood shingling on the bedroom addition, it should be returned to its original historic fabric of wood shingles and all flashing issues should be properly addressed to avoid further water damage.

There are several large trees close to the house, which should be removed or

pruned to avoid leaf deposits on and around the house. The general recommendation for this and other buildings on the site is to remove all

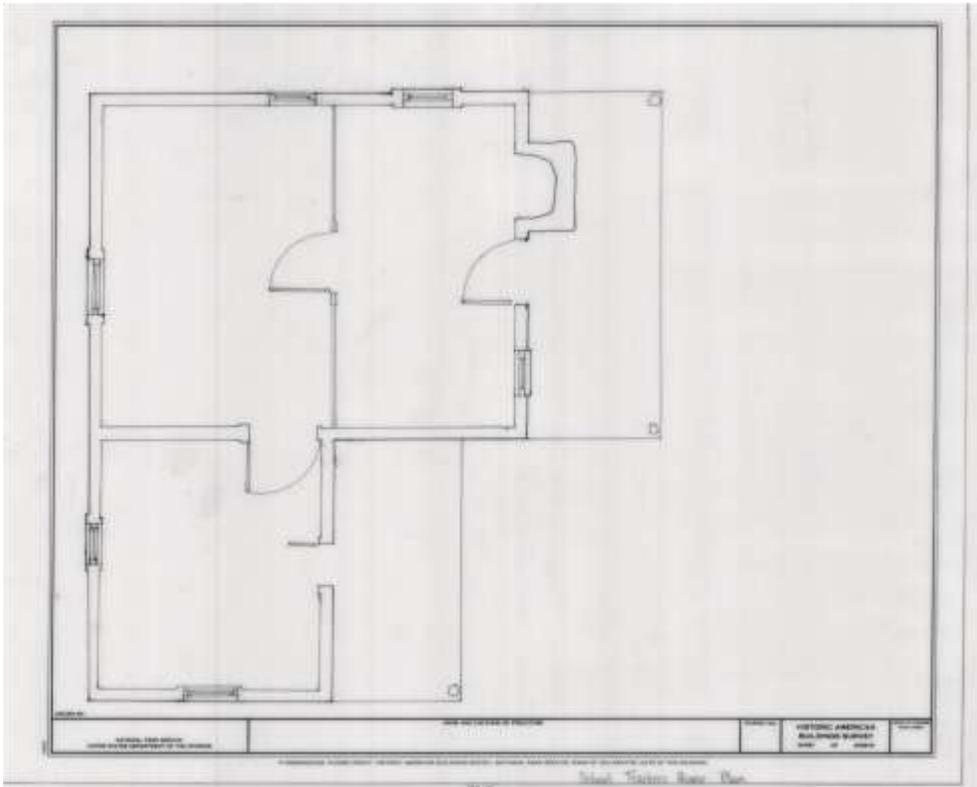


Figure O-10: The gap between the chimney and the house, which is contributing to moisture issues

Figure O-11 (left): Floor Plan of the School Teacher's House

trees within ten feet of any built structure. Other plants and dead organic matter should be maintained and kept clear of the building foundation. Wood and other materials have been stored under the building, all of which needs to be pulled out and stored in a more appropriate place.

The ‘folksy’ posts on the front porch should be replaced with something more appropriately resembling the original posts, which appear to have been simple 2” x 4”s.

The overall support system in the flooring due to poor methods of reinforcement, as well as the removal of the sill plate on the east elevation (leaving the exterior wall with no support), is in poor condition and needs to be properly reinforced.

p. west log crib



Building History and Description



Figure P-1: South elevation



Figure P-2: East elevation

The log crib is a small storage structure at Shields-Ethridge farm. It is likely among the oldest remaining structures on the farm, judging by its construction techniques. Currently it houses a large amount of unprocessed cotton for interpretive purposes. The previously produced site plan indicates it was moved to its current site from elsewhere. Further research is necessary to discern more information about the crib's past, such as what activities and uses occurred inside, and particularly relating to being moved, such as changes to the structure and orientation.

The crib has a pier foundation constructed of loose fieldstones bound with a small amount of mortar. Because it was moved, the foundation is not original, but this construction type is consistent with early work; the same stones may have been used. The piers range in height from 6" to 14.5" high, compensating for the irregular grade and logs. Unlike many structures on the farm, the crib is sufficiently above-grade to avoid water and insect damage.

The crib measures approximately 9'3" wide by 19' long, 9' elevation and a 5'3" tall roof. It is constructed of squared, hand-hewn logs and other wooden members. The floor is comprised of 3" thick planks of irregular widths, resting on a 12" by 6" hewn sill, notched at the ends to provide a gap in which the planks rest.

The walls are logs squared into timbers of approximately 6" by 10" dimensions. They are joined at the corner using half-dovetail joints. There are several spots along the eastern and southern walls where nails with tar paper traces, peg holes, and in some cases pegs, exist, indicating that a lean-to structure was attached to the Log Crib at some point in the crib's history. The logs on the south side are incised with slashed tally marks indicating the log's position in the elevation, which may date to construction, preserved by a since-removed lean-to.

Throughout the interior of the crib, small feather boards are nailed in gaps between logs. These were probably intended to help protect the crib from inclement weather, although many large gaps still exist.

Interior access is on the north side through a small wooden door, constructed of planks. Mortises around the door indicate that this door, while old, is not original. It is fastened with wrought iron hinges and a hasp.

The roof is 5v crimped steel over spaced sheathing. It is difficult to determine whether a portion of the roof was replaced when the crib was moved; the roof structure appears contemporary with the crib's overall construction, but if it was moved relatively early, the roof may date partially or completely to that time. The irregular, natural-edged spaced sheathing appears to be original, indicating the roof may have originally been covered in wood shingles. Given the crib's age, the roofing material has probably been replaced several times. The roof top plate and overhang extends 3'1" past the north wall, with 6" unsupported by the rafters and 6" unsupported over the south gable. The eaves extend 1'1". There are three notches on the roof top plate indicating 6" half-round joists, including a pegged fragment, but the joists are no longer extant.

The gable ends are sheathed in rough planks with irregular sides. The plank sizes differ between the north and south walls, with the south wall more irregular, suggesting that the north gable may have been re-faced early in the crib's history. There are gaps on the south gable between the irregular planks, but since the crib is well-ventilated and unoccupied, this is not problematic. The rafters are 2x4s. The west rafter on the south face has been replaced. The end rafters are disconnected at the ridge, diminishing structural strength, as they should be nailed together or at least resting against each other.

Existing Conditions

There is a considerable amount of built up organic matter under and against the crib, composed of both living and dead plants. This condition allows for the proliferation of pests that threaten the long term future of the crib, and also retain water, promoting rot.



Figure P-3: West elevation



Figure P-4: Detail of the half-dovetail joints used to join the timbers of the West Log Crib

The floor is one of the most deteriorated parts of the crib. It is suffering from salt leaching. This issue is likely the result of the activities

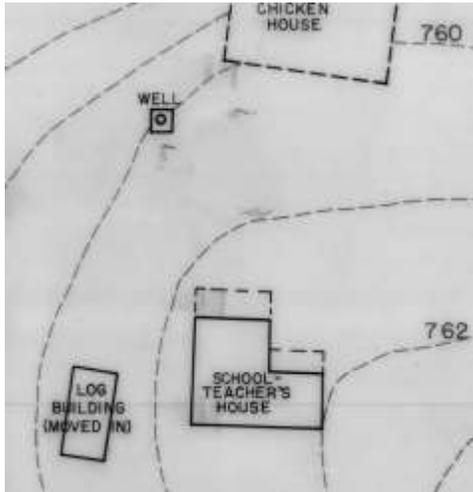


Figure P-5: Site Plan

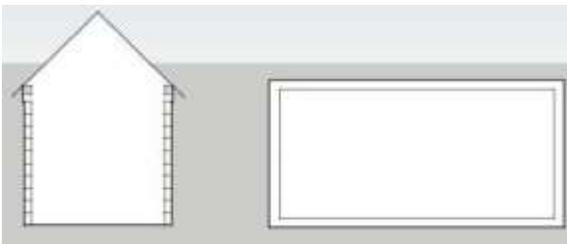


Figure P-6: Roof Diagram and Plan View

that historically occurred in the crib, such as meat curing, or storage of chemicals such as fertilizers. This caustic process has softened the wood fibers, leaving them weakened and more susceptible to rot and failure. As the planks rest on a sill, a flat ledge is left exposed and partly unprotected by the eaves of the roof. Water comes to rest on this ledge and cannot run off because it is flat, instead soaking into the face and end grain. This has promoted further decay. Because the planks are so thick, there are no floor joists.

The walls are suffering damage primarily from pests, primarily termites. The bottom sills are suffering from the same salt leaching as the floor. Several logs show signs of rot, termite, and powder post beetle damage. The bottom and third from bottom logs on the eastern façade are badly rotten and suffer from severe termite and powder post beetle infestation. In contrast, the south wall shows few problems, likely because it receives the most sun exposure.

The metal roofing is in good condition, except at the ridge, where it needs to be inspected and sealed. The roof's ridge board is unusually thin but does not play a significant role in structural integrity. The missing joists have contributed to the crib's racking and greatly diminish the roof's rigidity. The roof originally had three joists, which were removed for unknown reasons; the three evenly spaced notches on both the east and west sides indicate their position, and a fragment shows they were half-round.

Recommendations

The floor should be monitored for further deterioration. The unprocessed cotton stored inside the crib should be removed to prevent insect damage and moisture retention; for interpretive purposes, a few branches of cotton could be suspended inside.

The built-up organic matter should be cleared from around the log crib and maintained in this state, preventing further moisture infiltration. The perimeter of the crib's footprint should be sloped so that water runs away from the crib, allowing for proper drainage. No tree branches or other vegetation should be allowed within 6' of the building's perimeter to prevent future buildup. The site should be graded for positive drainage away from the crib within this perimeter.

Due to their thickness and the lack of active use on the interior, such as traffic or loads, the floor planks are not likely to fail completely. However, they should be closely monitored for rot insect damage, and other issues, as they have the potential to act as a conduit for infiltration of rot and insects into other parts of the crib. Chinking some of the gaps above the floor planks may help avoid further deterioration from standing water.

Similar 6” half-round joists should replace the missing ones, for authenticity and structural integrity. If the roofing fails in the future, it should be replaced by matching materials, either wood shingles or 5v galvanized steel depending on the chosen period of restoration for the farm as a whole. The wrought iron door hardware is on the verge of failure and should be reinforced with additional hardware to transfer the load.

As with virtually all wood on the Shields-Ethridge site, there is evidence of insect damage, and the crib will similarly have to be treated with insecticides. The crib is also suffering from racking, at least partially due to the removal of three ceiling joists. It is likely that the racking occurred during moving, but the crib should be monitored for further movement and be reinforced by additional structure if movement is observed.



Figure P-7: Termite damage within the bottom bog on the western side of the West Log Crib

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