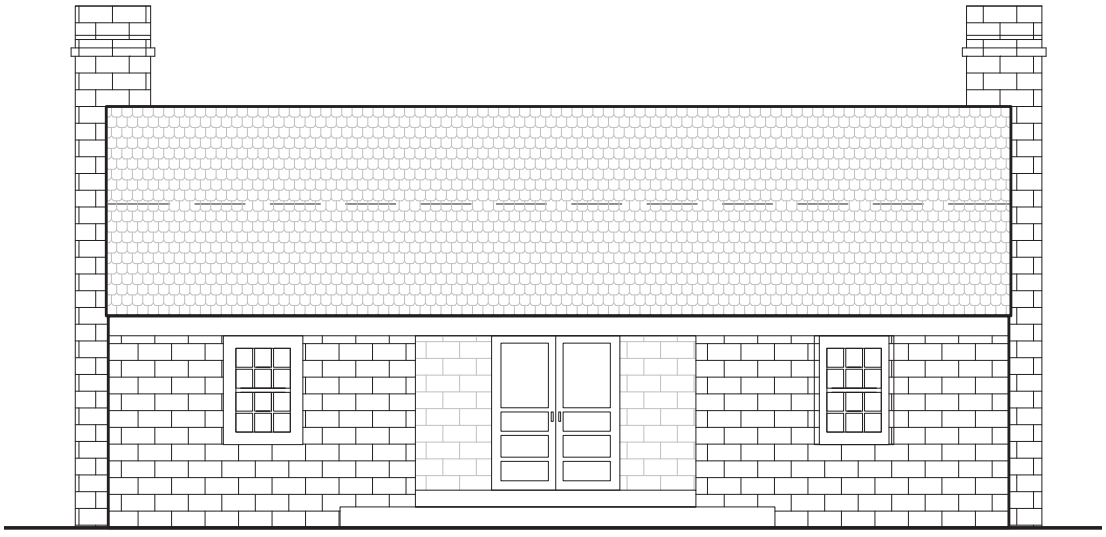
Round Rock Stagecoach Inn

Round Rock, Texas

Relocation Feasibility Study

December 5, 2016



ARCHITEXAS – ARCHITECTURE, PLANNING, AND HISTORIC PRESERVATION, INC.

Round Rock Stagecoach Inn

Round Rock, Texas

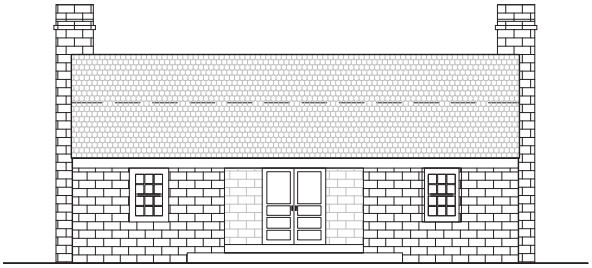
Relocation Feasibility Study

December 5, 2016

PROJECT TEAM

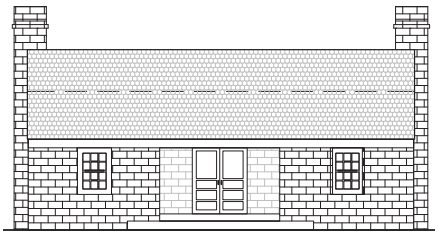
ARCHITEXAS
Architecture, Planning and Historic Preservation, Inc.
2900 South Congress Ave., Suite 200
Austin, Texas 78704
(P) 512.444.4220
(F) 512.444.4221

Table of Contents



I

INTRODUCTION



Project Statement

Executive Summary

Summary of Historic Research Findings

Photographs of Historic & Existing Elevations

Project Statement

ARCHITEXAS, Architecture, Planning & Historic Preservation, Inc. (AT) was hired by the City of Round Rock to develop a feasibility study for the relocation of the Round Rock Stagecoach Inn in order to make way for the new RM 620 improvements. The purpose of this study was to evaluate two potential relocation sites for the Inn and establish a planning strategy for the preservation of the structure. The findings and recommendations can assist with decision-making, fundraising, and implementation of priorities for important work to stabilize, relocate, rehabilitate and restore this highly significant structure.

The limits of the work for this study include the visible components of the interior and exterior of the structure and its immediate site. The City of Round Rock provided assistance with preparing the historical research about the structure, site and context. City staff also removed some of the Inn's later finishes to reveal historic conditions. This report includes the following:

- Research and review of the history and chronology of the structure to understand the original materials, architecture, and modifications over time.
- Collection of photographs showing historical elevations, subsequent alterations and existing conditions.
- Preparation of base drawings from field measurements to include a site plan with two (2) relocation options, existing and historic floor and roof plans, existing and historic exterior elevations, a demolition plan, and mothballing/stabilization annotated exterior elevations.
- Preparation of exterior and interior conditions analysis to include a brief description of assembly, notes on existing conditions, photographs of damaged or deteriorated materials, and recommendations for repairs or future rehabilitation.
- Evaluation of two (2) relocation sites and a phasing strategy for the preparation of the existing and new site, relocation of structure, stabilization and mothballing of structure, and full rehabilitation.
- Recommendations were developed for the stabilization/ salvage/removal of existing elements and for a mothballing strategy to implement while the building is inactive.
- Cost estimate for proposed scope of work in four phases.

The recommendations in this report are based on the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings. The Stagecoach Inn Relocation Feasibility Study was prepared by ARCHITEXAS under the direction of Stanley O. Graves, FAIA, Senior Principal, with the assistance of Izabella Z. Dennis, Architectural Conservator, of ARCHITEXAS.

Executive Summary

The Stagecoach Inn, constructed from 1848 to 1853, is one of the oldest buildings in the City of Round Rock, Texas. It was built by John J. Harris to service the stagecoach route from San Antonio to Waco and is situated on a hilltop at the intersection of Round Rock Avenue and Chisholm Trail, just south of Brushy Creek. Originally, the Inn served as a horse-changing station and rest stop, hosting the occasional overnight guest on his or her way to Austin. Over the past 160 years, it has served as a rest stop for travelers, a private residence and a restaurant. Today, the Inn is located in a commercial development known as “the Commons” and is in the path of upcoming Ranch-to-Market (RM) 620 improvements. ARCHITEXAS (AT) was hired by the City of Round Rock to conduct a study to determine the feasibility of relocating the Stagecoach Inn to a new site.

The City of Round Rock has identified two possible relocation sites:

1. The Commons Site, to the south of the current location
2. The Park Site, north on Chisholm Trail in the proposed Bathing Beach Park

In this report, AT evaluated the historical and physical integrity of the Inn and provided recommendations for a phasing strategy to relocate and stabilize the building. In addition, AT evaluated the two potential relocation sites with regards to impact on historical integrity, visibility and accessibility to the public, site location, programming potential, and cost.

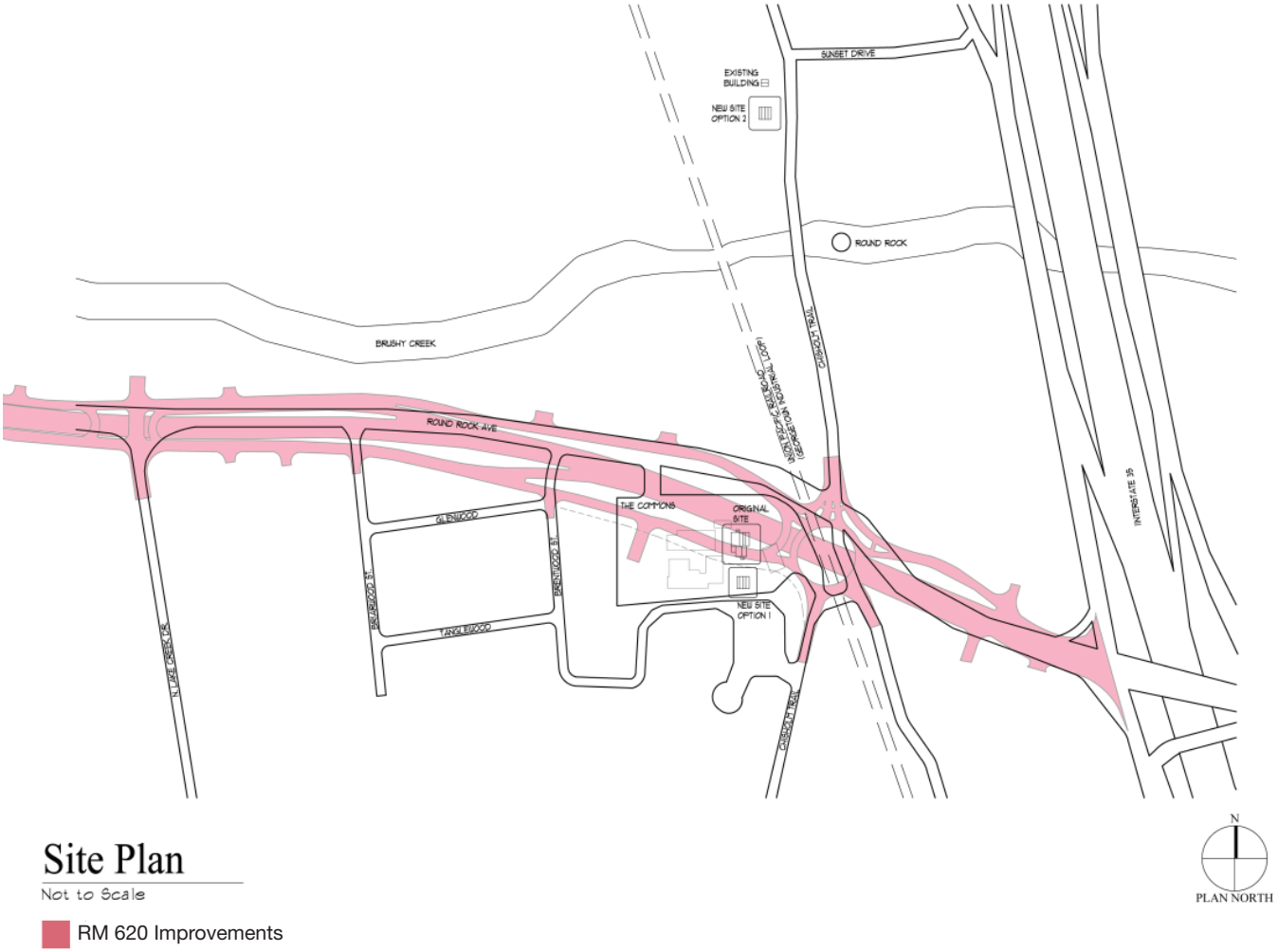


Figure 1. Site Plan, including the two relocation site options
(Drawing by ARCHITEXAS, 2016)

Executive Summary, cont'd.

Relocation and Phasing Strategy

The relocation of a historic building should only be considered as a last resort and is typically reserved for buildings that face demolition. In order to successfully provide recommendations that prioritize preserving the integrity of this historic resource, ARCHITEXAS has followed strategies set by the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings. Although the building is no longer determined eligible for state significance by the Texas Historical Commission, it is a local historic landmark, and remains an important piece of history for the local community.

The Secretary of the Interior's Standards recommend identifying a clearly definable and finite "period of significance" when historic events or activities occurred. The proposed period of significance for the Stagecoach Inn has been determined to be the "pre-railroad" years of Round Rock, dating roughly from 1848, when construction on the building began, through 1876, when the railroad line came to the city. The majority of the structural systems, materials and character-defining features should be true to the period of significance so that the building is clearly identifiable as a product of the time.

The proposed relocation and future rehabilitation of the Inn should comply with the Secretary of the Interior's Standards for Rehabilitation. The Standards for Rehabilitation recommend that "the historic character of a property shall be retained and preserved" but recognize that some changes are required for a structure to be functional for contemporary use. Under these Standards, a complete "restoration" to the original building is not required, but the retention of original materials, craftsmanship and character is highly encouraged. Any new changes or additions should be compatible with the historic building, and repair of materials is preferable to replacement. Although additions and renovations to the Stagecoach Inn have occurred, the historic footprint and chimneys are intact. The modern additions are easily identifiable and removable. It is recommended that only the existing elements of the original structure be moved and that additions be demolished prior to this. The north, south, and west walls will require immediate stabilization after the move to seal up the building until a full exterior and interior restoration can be undertaken. The historic integrity of the Stagecoach Inn can be preserved through sensitive rehabilitation and interpretation at its new site.

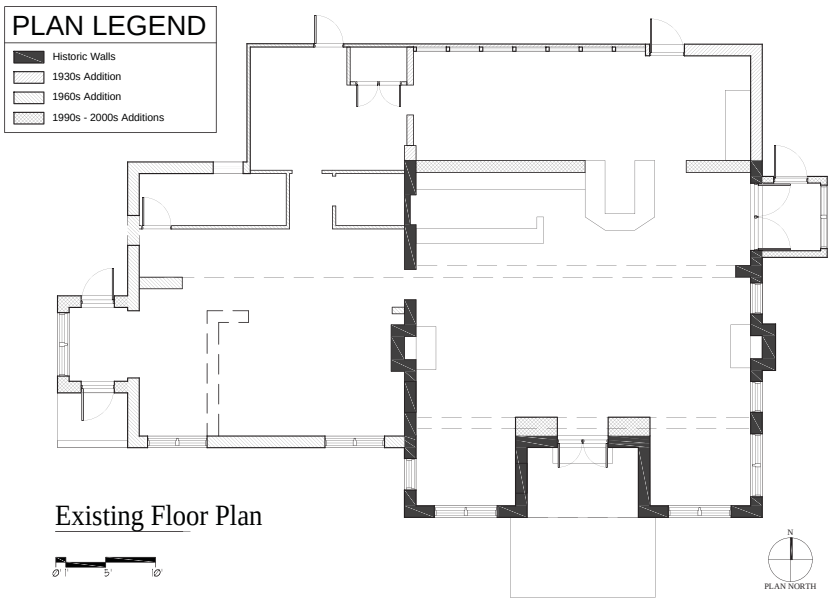


Figure 2. Plan of Existing Building, showing historic walls
(Drawing by ARCHITEXAS, 2016)

Executive Summary, cont'd.

Structural relocation is a complex process and AT is recommending a four-part phasing strategy for relocation and basic rehabilitation:

- Phase 1 Initial Work: The historic building should be prepared and stabilized for relocation. Non-historic additions and finishes should be removed, and building materials may be selectively salvaged.
- Phase 2 New Site Preparation and Relocation of the Historic Building: The new site must be prepared with a foundation and necessary site work (landscape and grading), and the building will be jacked up and moved by a qualified structural mover.
- Phase 3 Stabilization of the Historic Building at the New Site and Mothballing of the Structure: Immediate stabilization of the structure will be required for the long-term preservation of historic materials. If the building is not fully rehabilitated following the move, it can be mothballed to preserve it in an inactive state for up to 10 years.
- Phase 4 Basic Rehabilitation of the Structure: The basic rehabilitation of the historic building will generally include: (1) reconstruction of the historic windows, (2) replacement of doors, (3) mortar, masonry and chimney restoration, (4) interior wall construction and (5) floor installation. Depending on the determined use of the structure, MEP systems and ADA modifications may be necessary.

Relocation Sites and Estimated Costs

The bulk of the cost for the structural relocation of the Inn will be spent on getting the building on and off the moving vehicle, and, therefore, the distance to the Park Site only adds $20,000 to the estimate. There are significant additional costs for preparing the railroad tracks and Brushy Creek bridge (+$50,000) as well as for integrating the building into the new Bathing Beach Park site (+$30,000). The integration cost includes integration, interpretation and landscaping but not any redesign fees.

The Commons Site will allow the Inn to retain the highest degree of historical integrity, due to its proximity to the original location and its comparable setting; however, the obstruction of visibility and access due to the new nearby overpass may make educational and public programming options more challenging. The estimated cost for the relocation to the Commons Site through a full rehabilitation is $614,722.

The Park Site will be more visible to and easily accessible by the public. This relocation is more expensive at $758,107 due to the complexity of the travel route and the undeveloped site. The Park Site would allow the Inn to join a collection of comparable historic resources on Chisholm Trail. It would be ideal for public or educational programming options, but may be less appealing to potential commercial owners.

ESTIMATED FINAL CONSTRUCTION COST

PHASE	COMMONS SITE	PARK SITE
Phase 1: Initial Work*	$ 22,368	$ 22,368
Phase 2: New Site Preparation and Relocation of Historic Building	$ 300,589	$ 401,503
Phase 3: Stabilization of Historic Building at New Site and Mothballing of Structure	$ 81,456	$ 81,456
Phase 4: Basic Exterior and Interior Rehabilitation of Structure	$ 210,309	$ 252,780
TOTAL	**$ 614,722**	**$ 758,107**

* Detailed costs are included in Section III of the Stagecoach Inn Relocation Feasibility Study. Select costs in Phase 1 have been identified as demolition items that will occur whether or not the building is demolished and are, therefore, not specific to this project. These costs total $19,440 and they are itemized for reference but not included in the estimated total construction.

Executive Summary, cont'd.

Relocation Project Scope

The first three recommended phases of the project are necessary to stabilize the building and ensure long-term preservation. Mothballing the building is highly encouraged if a full rehabilitation cannot be undertaken immediately. It will protect the building for up to 10 years and allow the building to function as an inactive historic artifact. The fourth phase, which includes a basic rehabilitation of the exterior and interior of the structure, will complete the exterior envelope and apply basic interior finishes. A programming use should be determined prior to the full rehabilitation. There is a cost savings of approximately 20% to 30% off of the total cost estimate if Phase 3 is forgone and the building is immediately rehabilitated after relocation.

Additional Considerations

At the completion of this report, AT identified various elements relating to the site and rehabilitation that should be considered but are outside the scope of this study. These elements are described below:

There are several site components that were constructed after the proposed period of significance, including the stacked rock walls and well. The City of Round Rock shall determine if these materials should be salvaged and repurposed at a relocation site or alternate public space. The City can also determine if there are elements of the relocation project, in particular relating to salvage, that may be undertaken by volunteers. After a structural mover and mason have been selected, the City can work with the mason and mover to determine the exact costs and feasibility of salvaging masonry material.

With limited historical documentation of the interior plan, the City of Round Rock or new owner can work with a preservation architect to devise a historically appropriate interior influenced by the intended use. Interpretation of the interior plan and building elements, such as the possible enclosed doorway to the south in the entryway, should be considered. Generally, the full interior rehabilitation will cost $100 to $200 per square foot and may include the construction of partition walls and doors, as well as the restoration of the fireplaces and reconstruction of mantels.

Feasibility

ARCHITEXAS has worked with two separate structural movers to estimate the cost and feasibility of the move. They have both confirmed that the building can be stabilized and moved in one piece to either location. The movers have also confirmed the feasibility of moving the building across the railroad tracks and bridge. AT has confirmed with Union Pacific that it is possible to move the building across the tracks. Findings and relevant logistics are included in this report for the City of Round Rock to reference.

Summary of Historic Research Findings

Figure 3. Earliest known photograph of the Stagecoach Inn
(Source: City of Round Rock)

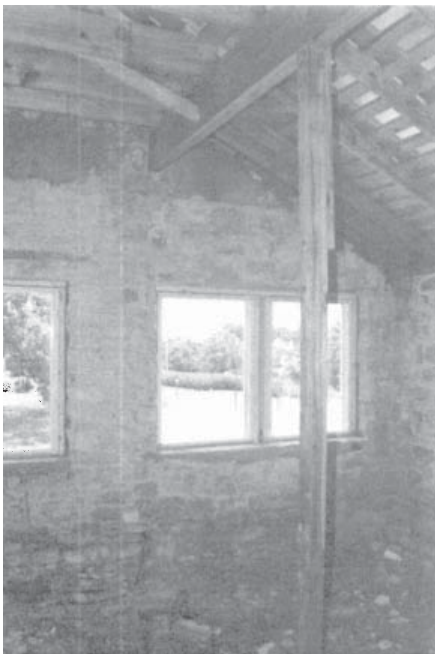


Figure 4. 1990s Restoration showing evidence of pole rafters and demolition of flooring (Source: City of Round Rock)

Figure 5. 1990s Restoration showing earlier fireplace and previous casement windows (Source: City of Round Rock)

Located near the Round Rock, where Chisholm Trail crosses Round Rock Avenue, the Harris Stagecoach Inn is a remaining part of Round Rock's earliest founding. It was built before the settlement was named Round Rock, and even before Williamson County was established. John J. Harris built the Stagecoach Inn over five years, from 1848 to 1853, making it one of the three oldest surviving buildings in Round Rock. The property became a Registered Texas Historical Landmark (RTHL) in 1963, less than a year after the landmark program was established.

Round Rock grew to serve travelers along one of the state's most important north-south roads, with regular stagecoach services from Brownsville to Salado and from San Antonio to Helena, Arkansas. The Inn served mainly as a horse-changing station and rest stop. Because it was close to Austin, overnight lodging was usually only necessary during bad weather or when the creek was high. Mrs. Susannah Elizabeth Tisdale Harris was proud that every room had its own feather bed, courtesy of the flock of geese the family kept. A neighbor recollected that the geese would honk loudly when a stagecoach was about a mile away, alerting the townspeople to meet the coach and see if they had received any mail.

The 36' square, one-story, side-gabled masonry structure is typical of a 19th century Texas vernacular hall-and-parlor building, sometimes referred to as "pre-railroad" style. The 14" thick limestone walls were constructed from stone quarried from the hill on which the building stands and the original chisel marks are still visible on the historic stone faces. The Inn had ten six-over-six double hung wood windows and a unique, wide, recessed front entryway which provides shelter to the east-facing main double doors. The outline of a single door in the recessed entryway to the south of the main doors is visible in the masonry wall. Historic photographs show single doors at the south and west sides of the building. The broken-gabled roof has a masonry chimney at each end. There is a segmental arch above each interior fireplace. Little historical evidence is available regarding the interior of the structure and the original floor plan, but it is thought that there was an entry hall with cedar flooring. Placement of exterior doors can help to understand potential interior spaces and can assist with creating a conjectural historical plan. A historic photograph of the west elevation shows a flue at the northwest corner of the building, indicating an early kitchen in this space.

Although there have been a number of additions to the Inn over the years, its owners have made a consistent effort to avoid major exterior changes to the original structure. In the 1910s or 1920s, the dry-stacked limestone walls were added to the site. In the 1930s, a west addition with modern plumbing was added and the window openings were enlarged to accommodate casement windows. The cedar flooring was covered with oak flooring in the 1950s and, in the 1960s, the Davol family added to the south end of the structure. The additions are compatible to the historic structure with slight variance in material. The south addition is connected by an arched doorway that appears to be slightly west of the original entryway. During the 1980s, the site was redeveloped into a retail and office complex known as "The Commons" and, in 1994, a new metal roof was installed and all of the windows were replaced with single lite fixed windows. Since then, small entryway additions have been added for the north and southeast entries to the building.

The Inn was originally in operation for 30 years, until the International & Great Northern Railroad extended a line into Williamson County, drawing travelers and merchants to the depot and the new town around it. The Inn became a tavern, then a residence for about a century, and, lastly, a restaurant from the mid-1990s to 2012. It has remained a significant and visible symbol of Round Rock's history and, although it is no longer RTHL eligible, the building was honored with the 2013 City of Round Rock Local Legend Award and is designated as a local historic landmark.

ARCHITEXAS and the City of Round Rock collaborated on the historic summary, and a more in depth text is included in the Appendix.

Photographs of Historic & Existing Elevations

Historic Photographs Showing Original Structure

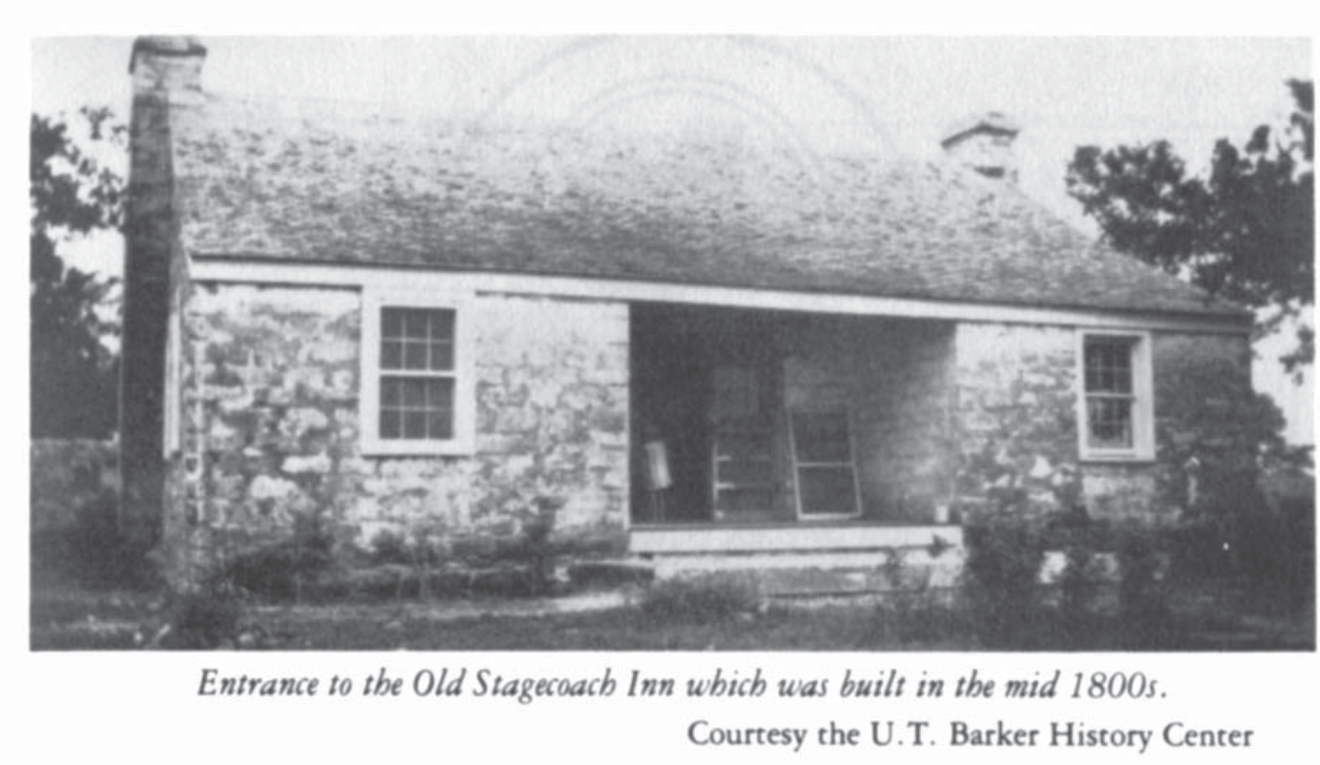


Figure 6. Historic Photograph of East Elevation circa 1920s
(Source: the Eugene C. Barker History Collection at the University of Texas at Austin Briscoe Center)

Figure 7. Historic Photograph of South Elevation
(Photograph taken between 1907 and 1932
Source: Round Rock Preservation/B. C. Richards Family)

Historic Photographs Showing Original Structure, cont'd.

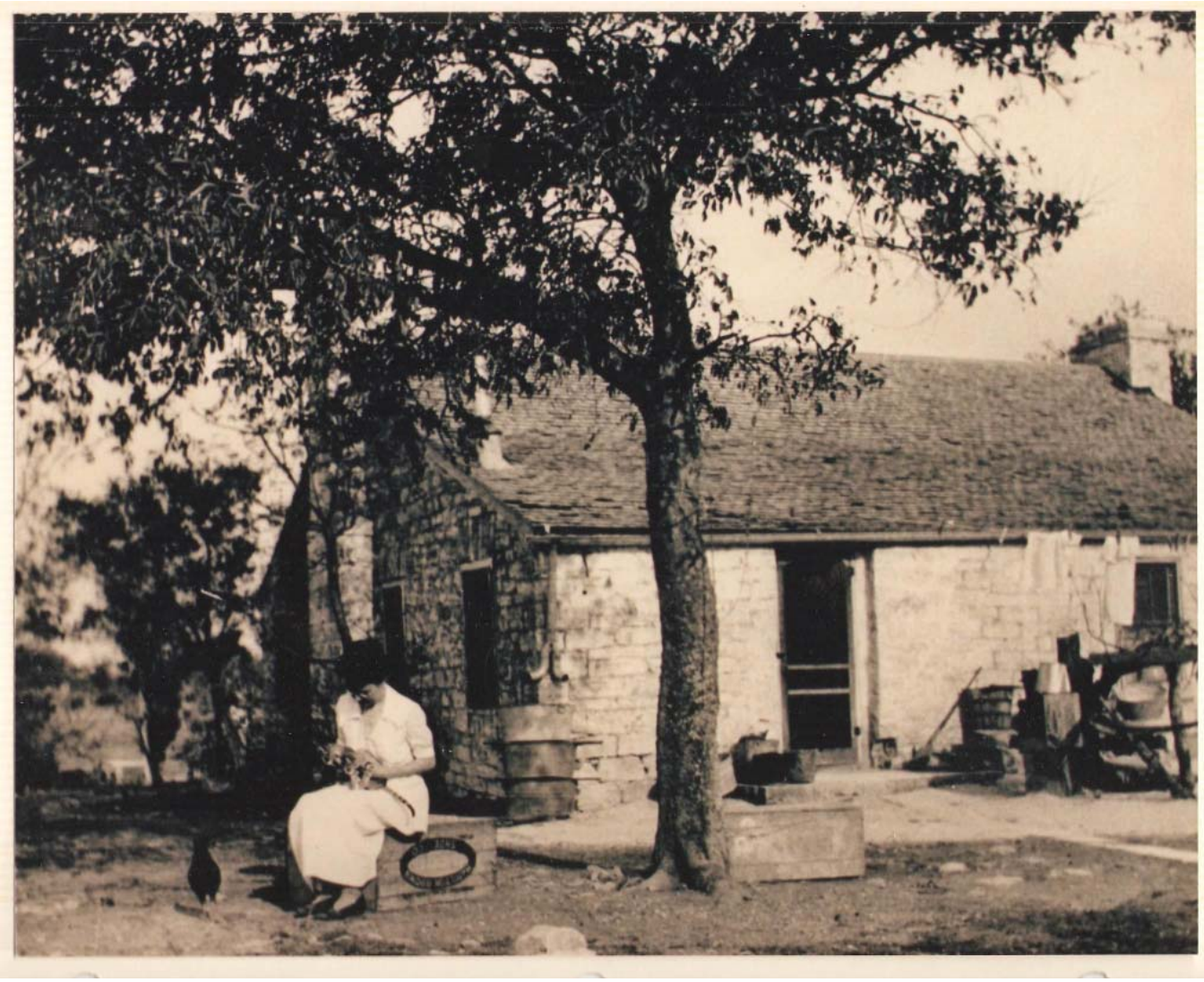


Figure 8. Historic Photograph of West Elevation
(Photo: Taken during Benjamin Chester Richards Family Ownership from 1907 to 1932
Source: Round Rock Preservation/B. C. Richards Family)

Additions & Renovations to Original Structure

Figure 9. 1930s Renovations: enlarged window openings, casement windows and west back addition
(Photo circa 1940s, Source: Texas State Archives)

Figure 10. 1930s Renovations: enlarged window openings, casement windows and west back addition
(Photo circa 1965 when Inn was personal residence of Mr. and Mrs. Davol
Source: Round Rock Chamber of Commerce, 1965)

Additions & Renovations to Original Structure, cont'd.

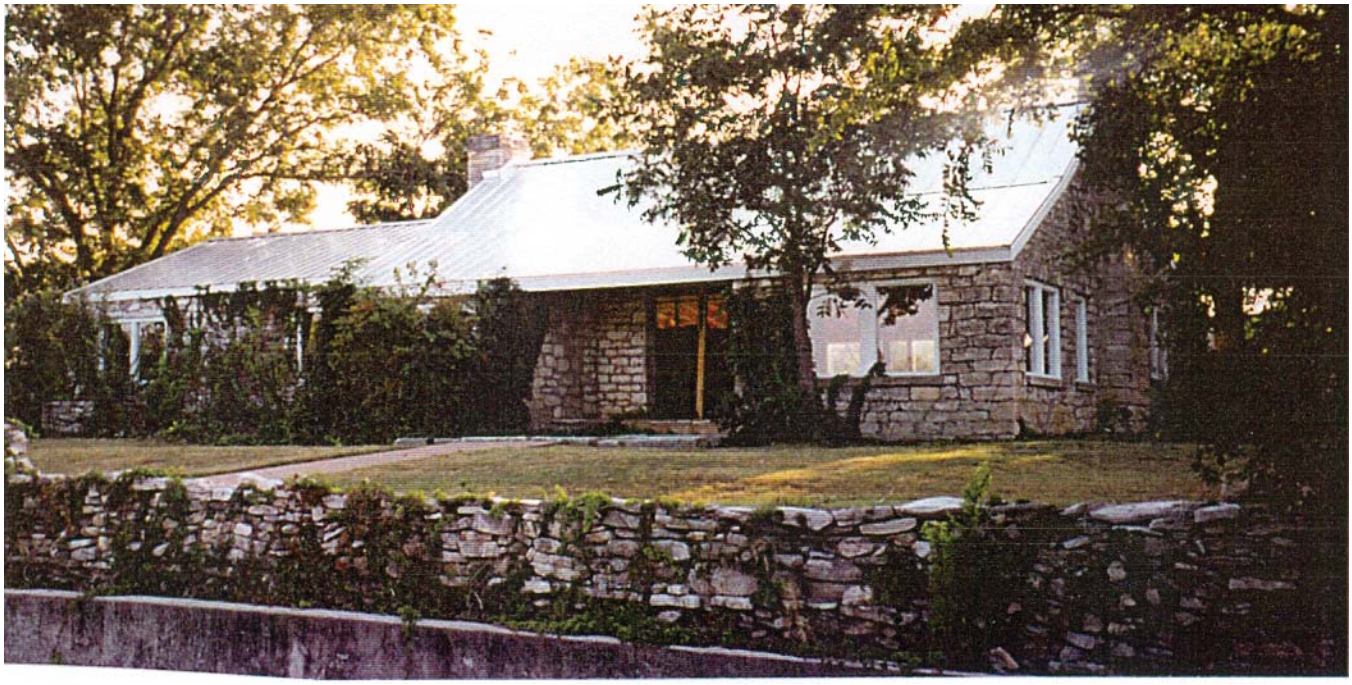


Figure 11. 1994 Renovation: South addition, new metal roof, replacement windows, new landscaping and entryway steps (Source: City of Round Rock)

Figure 12. 1994 Renovation: South addition, new metal roof, replacement windows, new landscaping and entryway steps (Source: City of Round Rock)

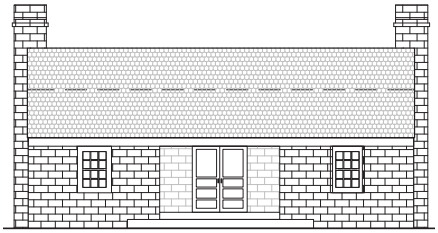
Existing Elevations (Photographs taken 2016)

Figure 13. East Elevation
(Photographs by ARCHITEXAS, 2016)

Figure 14. South Elevation
(Photographs by ARCHITEXAS, 2016)

Figure 15. North Elevation
(Photographs by ARCHITEXAS, 2016)

II
Evaluation of Relocation Sites



Evaluation of Relocation Sites

Relocation Site Plans

Comparative Evaluation of Sites

The US Department of the Interior advises that historic buildings should only be moved as a last resort to evade impending demolition. Significant aspects of the historic building's character, most importantly the integrity of its setting and its "sense of place and time", are often lost during the relocation. The original site of the Stagecoach Inn is integral to its original function. Selection of an appropriate new site is a significant factor in the long-term success of the relocated structure. When evaluating a relocation site for the Stagecoach Inn, a number of factors should be considered.

1. Can the building logistically be moved to the new site?
2. What type of preparation is required at the new site and for the transit route?
3. Is the new site easily accessible to visitors? Will it allow for a wide range of programming options, depending on the final use?
4. Is the site securable? Will the building be subject to further deterioration or vandalism?
5. How does the new context affect the interpretation of the historical significance of the building?
6. Will the building have a similar aesthetic relationship to the site?
7. How does the new site affect the overall integrity of the historic building? The US Department of the Interior assesses integrity of a historic property based on seven aspects: location, design, setting, materials, workmanship, feeling and association.
8. What are the relative costs for the relocation and stabilization of the building?

Preservation of the structure's integrity, an understanding of its history and significance to Round Rock, and a continued interpretation of the Inn as a "rest stop" for the City should be prioritized. There are two site options for the relocation of the Stagecoach Inn (see Site Plans on page 21).

Option 1: The Commons Site

The proposed Commons Site is south of the Stagecoach Inn's current location and the building would continue to face Chisholm Trail. The relationship between the Inn and its location is important to understanding why the building was constructed and what its original function was. The Inn was built on the hilltop Commons site to capture the view of travelers along the Chisholm Trail and to be visible to those incomers. The site is particularly important for recapturing the sense of historic events and historic use. Furthermore, the community already has a familiarity and association with the location of the building.

The route to this site has minimal obstacles and site design would be least extensive, making the relocation approximately $100,000 less than the relocation to the Park Site. The building's setting would retain a high degree of integrity due to similar topographic features and vegetation, assuming they remain consistent. There is a material connection between the limestone blocks used to construct the building and the physical Commons site, which is the hill from where the limestone was quarried.

Logistically, the site is securable and has access to utilities. The buildings at the west side of the Commons are planned to remain in active use, which will reduce the potential for vandalism. An active site is beneficial in case there is an issue or damage to a building because it may be spotted and remediated more quickly. Depending on the future programming requirements, infrastructure, such as parking and rest rooms, may be available or negotiated with the existing buildings at the Commons. The complex and site already have the potential for commercial or office use.

The RM 620 project involves the construction of an overpass directly to the north of the proposed Commons Relocation Site. This would block views of the Inn from the road, and it could potentially disrupt traffic flow and easy access to the

Comparative Evaluation of Sites, cont'd.

building. Because programming and future use has not yet been determined, this factor has an uncertain effect. For instance, if an office takes over the building, the road construction may have little effect; however, if the building becomes an educational space, it may be difficult to find and potentially would have less organic traffic. Appropriate signage and marketing, coupled with successful landscaping could limit negative effects of the nearby road.

The Commons Site would allow the Stagecoach Inn to retain the highest degree of historical integrity and is the less expensive option. Visibility and access will be limited by the new road and this may make successful long-term use more challenging for public or educational programming options.

Option 2: The Park Site, north of Chisholm Trail near Brushy Creek

The Park Site is north of the existing site on Chisholm Trail and is within the proposed Bathing Beach Park at Brushy Creek. The Inn would be placed in a grassy open space just to the south of the existing 1870s Sansom House at 750 Chisholm Trail. The main entrance of the building would continue to face east towards Chisholm Trail. The travel route for the relocation of the Stagecoach Inn to this site has been mapped through the east side of the Commons development, over the Union Pacific Railroad tracks and north on Chisholm Trail, crossing the Brushy Creek bridge along the way. Structural movers have confirmed that is feasible and preferable to move the building in one piece.

The building would be easily accessible and visible to visitors at this location. The stretch of Chisholm Trail between Sam Bass Road to the north and Brushy Creek to the south has a concentration of six historic buildings, as well as the Round Rock. The Stagecoach Inn could strengthen the compelling visual narrative of 19th century Round Rock on this street and be integrated into the new park. Marketing the area as a historic district for the City of Round Rock could enhance civic pride, educate the public and attract visitors to the historic buildings and new Bathing Beach Park.

Moving the building across the railroad tracks and over the Brushy Creek bridge adds additional costs to the Park Site relocation. The structural mover would build a bridge over the railroad tracks to protect them from the vehicle and would most likely have to reinforce the bridge to support the weight of the building. Traffic would be detoured along vehicle route and a police escort would have to be retained. There would be a larger cost to integrate the building into the Park Site than at the Commons Site and infrastructure, such as parking and rest rooms, will be required. Until the Bathing Beach Park is completed, regular inspection and maintenance, as well as heightened security surveillance, may be required to prevent vandalism and to monitor the building for issues.

The interpretation of the Stagecoach Inn and its place in Round Rock's history is be more challenging at the Park Site, and the relationship between the building and the hilltop site would be lost. Furthermore, the Sansom House is thought to have been constructed as a stagecoach stop or livery. Two stagecoach stops next to each other may compromise the integrity of both and may require education and interpretation of not only the Stagecoach Inn, but of the Sansom House as well.

Although more easily accessible to the general public, the Park Site may be less appealing to potential commercial owners. The Park Site is the more expensive option, but it would allow the Inn to join a collection of comparable historic resources in the City of Round Rock.

Relocation Site Plans

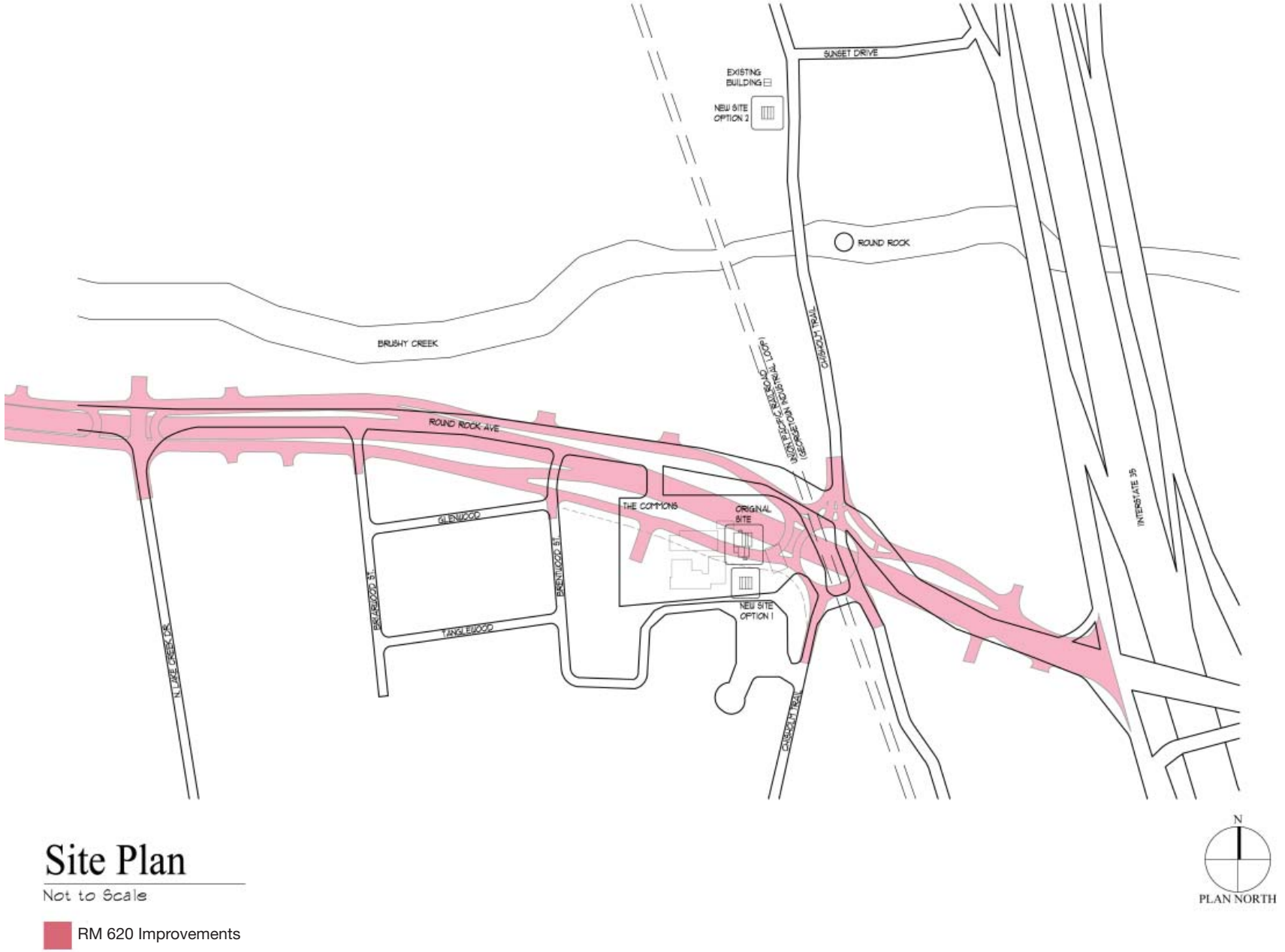


Figure 16. Site Plan, showing both relocation sites and the proposed RM 620 improvements in red
(Drawing by ARCHITEXAS, 2016)

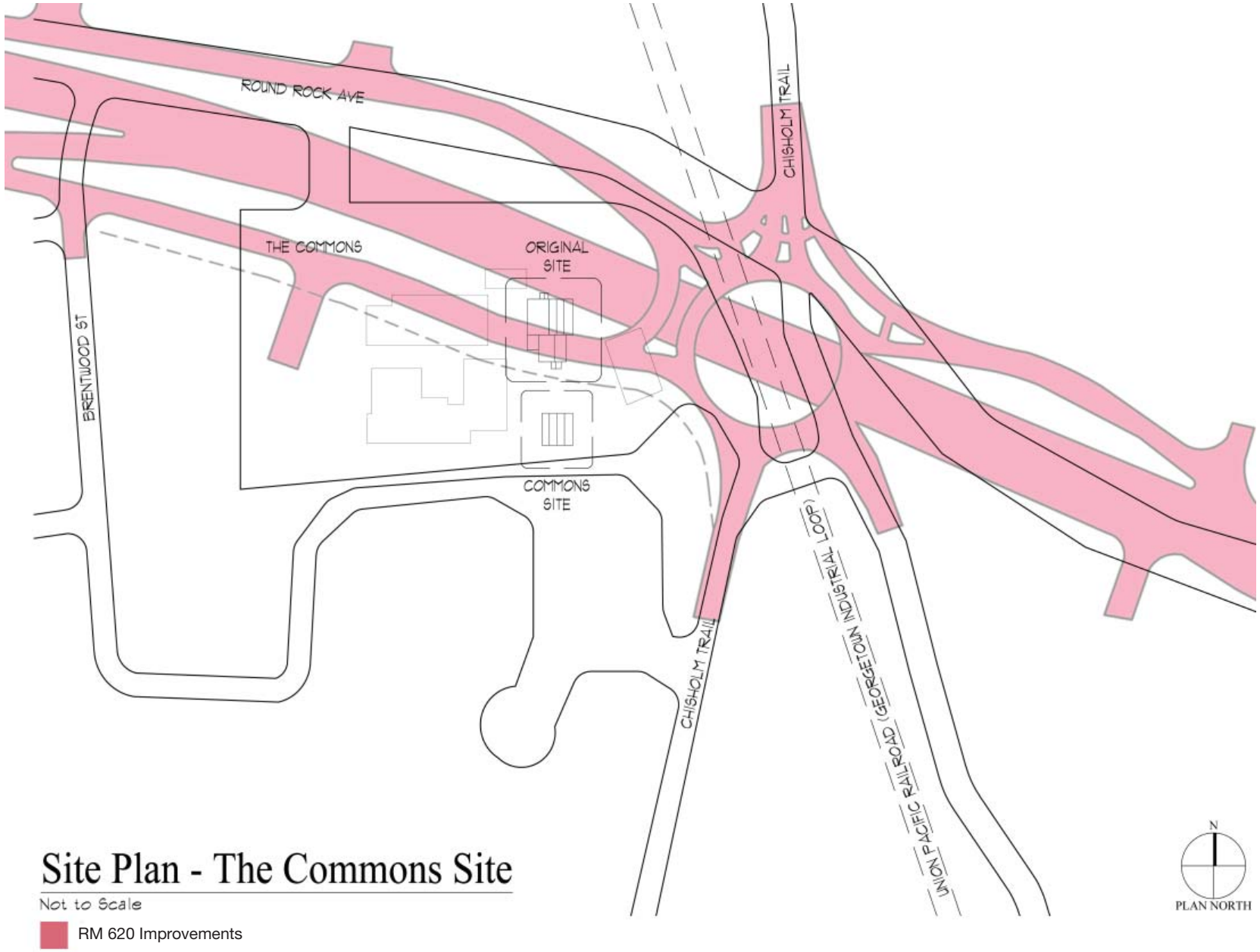


Figure 17. Site Plan, showing the Commons Site and the proposed RM 620 improvements in red
(Drawing by ARCHITEXAS, 2016)

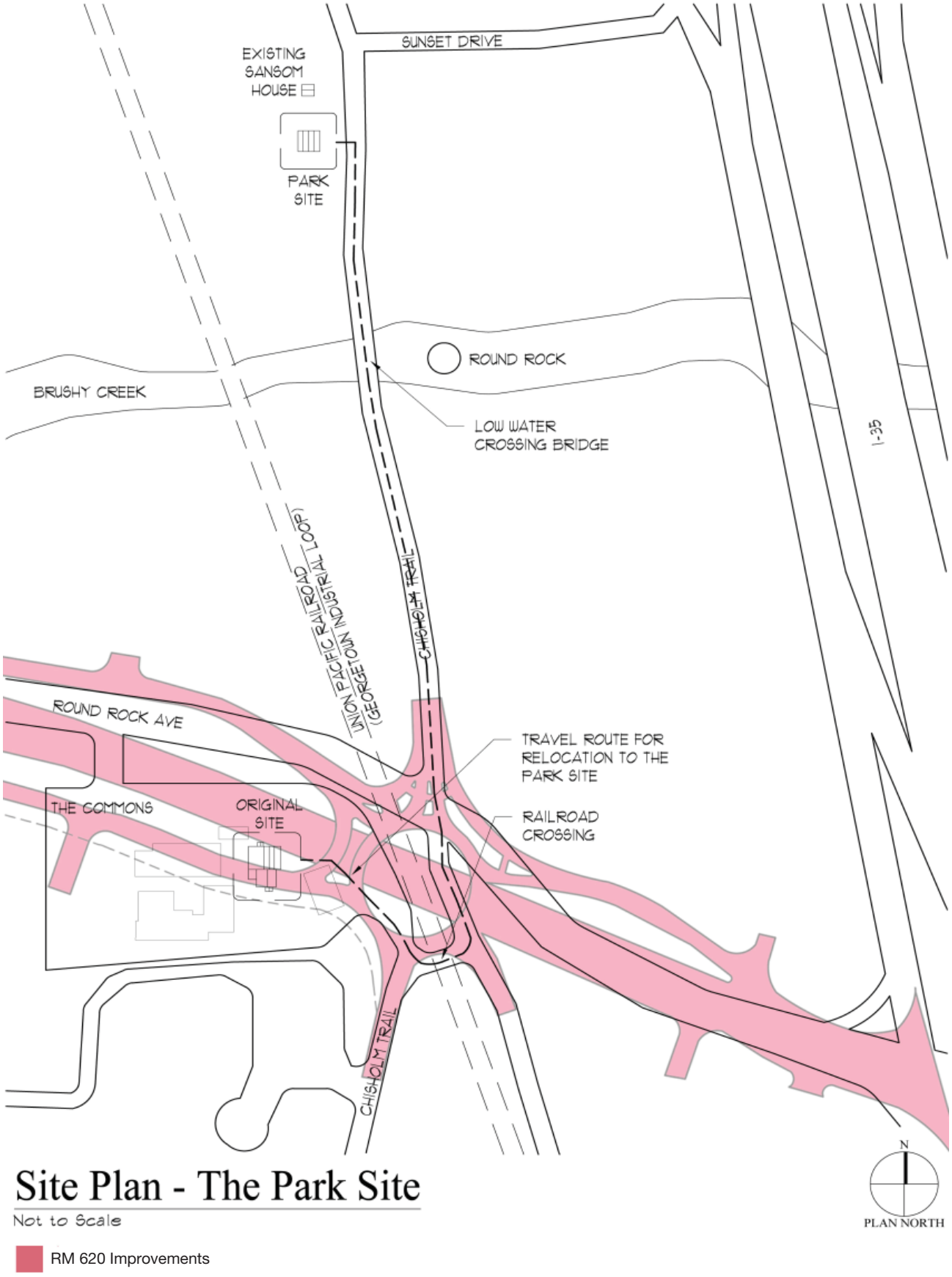
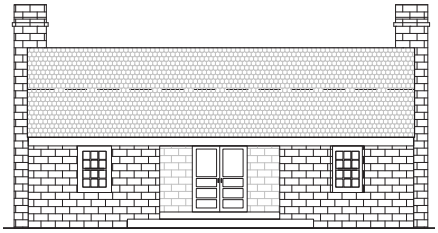


Figure 18. Site Plan, showing the Park Site and the proposed RM 620 improvements in red (Drawing by ARCHITEXAS, 2016)

III

Estimated Costs & Phasing Strategy



Estimated Costs & Phasing Strategy

Estimated Costs & Phasing Strategy

A four-part phasing strategy is recommended to relocate and fully rehabilitate the Stagecoach Inn. Guidelines and recommendations from the National Park Service and the US Department of the Interior Technical Preservation Services Department were referenced to create phasing strategies that ensure the preservation of the historical and structural integrity of the building. Initially, the existing historic building should be prepared and stabilized for relocation. Second, the new site will be prepared and the building relocated. Third, the building can be stabilized using a method for deactivated buildings known as "mothballing" and, lastly, as resources allow, the historic structure can undergo a preliminary rehabilitation.

ESTIMATED FINAL CONSTRUCTION COST

PHASE	COMMONS SITE	PARK SITE
Phase 1: Initial Work*	$ 22,368	$ 22,368
Phase 2: New Site Preparation and Relocation of Historic Building	$ 300,589	$ 401,503
Phase 3: Stabilization of Historic Building at New Site and Mothballing of Structure	$ 81,456	$ 81,456
Phase 4: Basic Exterior and Interior Rehabilitation of Structure	$ 210,309	$ 252,780
TOTAL	**$ 614,722**	**$ 758,107**

* Select costs in Phase 1 have been identified as demolition items that will occur whether or not the building is demolished and are, therefore, not specific to this project. These costs total $19,440 and they are itemized for reference but not included in the estimated total construction.

Cost estimates for a full restoration to make the building interior functional will depend on programming needs and is beyond the scope of this report. For budgetary purposes, restoration costs can be estimated at $100 to $200 per square foot.

The sources for this cost estimate include structural movers consulted about the Stagecoach Inn, resources included in the "Sources" section of the Appendix, and past comparable preservation projects undertaken by ARCHITEXAS. The estimated costs for the Stagecoach Inn relocation are intended for budgetary planning. Actual costs may be vary due to contractors selected and unexpected findings in the historic building or at the relocation site.

Key for Cost Estimate Worksheets

KEY

L.S.	Lump Sum
Ea.	Each
S.F.	Square Foot
L.F.	Linear Foot
Allow	Allowance

PHASE 1

Phasing Strategy & Estimated Costs

In the first phase of the relocation process, the existing building and the site must be prepared for the structural moving team. The period of significance for the Stagecoach Inn has been determined to be the “pre-railroad” years of Round Rock, dating roughly from 1848, when construction on the building began, through 1876, when the railroad line came to the city. Based on research from available historical sources, a conjectural plan and set of elevations for the original building have been prepared (See Historic Elevations on pages 48-49 and Conjectural Historic Plans on page 46). Any additions outside of this time period and all interior fixtures or furnishings (which are nonhistoric) should be removed to lighten the load for the move. The existing roof structure, windows and doors should remain until the full rehabilitation is possible in Phase 4. Where removed additions have left gaps in exterior walls, temporary braced walls should be installed to stabilize the structure for transit. Minor patching to the roof will most likely be required after the additions are removed.

The structural mover will advise on which landscape features, including trees and pathways, require removal to create a path for the truck and building. The stacked rock walls on the Stagecoach Inn site were installed during the 1930s. They are not historic to the building nor part of the proposed period of significance, but may provide useful building material at the new site or other public sites. The City of Round Rock shall determine if the stacked rock walls should be salvaged and reinstalled based on potential future programming or interpretation. The City of Round Rock can work with the masonry contractor to determine the feasibility of salvaging any nonhistoric limestone from demolished additions and the interior masonry wall at the south wing to use for the reconstruction of masonry walls in Phase 3.

The City may consider inviting volunteers to assist with salvaging the stacked rock walls, salvage and/or resale of fixtures/furniture, and removal of window awnings. Interim storage for any salvaged materials shall be arranged by the City of Round Rock.

Phase 1: Initial Work

1. Hire a hazardous materials abatement specialist to evaluate if hazardous materials are present and require abatement.
2. Salvage or demolish stacked rock walls, based on new site needs.
3. Demolish pathways, as needed.
4. Remove nonoriginal additions in order to restore the structure to its 19th century period of significance. See Demolition Plan in on page 37 for detailed information about additions.
5. Remove necessary trees and other site elements that obstruct the relocation vehicles and building path. This will be determined by the structural mover. Depending on circumstances, tree and building addition removal may be accomplished by the contractor responsible for clearing the path for the new road construction.
6. Install temporary walls at north and west sides where additions have been removed to stabilize structure for relocation.
7. Salvage large stones from nonoriginal masonry partition wall in south room and from exterior walls of additions to reuse in reconstructed walls.
8. Salvage large paver stones from the entryway and porch.
9. Repair and stabilize the metal roof at west side where addition has been disconnected, as necessary.
10. Remove all window awnings.
11. Demolish and remove all modern light fixtures, furniture, mill work, and built-in elements. The City of Round Rock can choose to salvage and resell these items or not.
12. Evaluate and remove any unnecessary MEP systems.

PHASE 1

Phasing Strategy & Estimated Costs, cont'd.

Potential Expenses Not Included in Cost Estimate

1. If hazardous materials are present, additional costs for abatement will be incurred. This cost is variable and will depend on the type, complexity and quantity of hazardous materials.
2. The City of Round Rock should determine the extent of salvageable masonry with the contractor, who can advise on feasibility, exact costs, and practicality. This will also depend on how many phases the City of Round Rock plans to undertake at once.
3. Certain items in Phase 1 will be required regardless of whether the building is demolished or relocated. For this reason, they are not project-specific and are isolated from the total estimated costs.

Estimate of Probable Cost
Phase 1_Initial Work

		Commons Site					Park Site				
No.	Item	Quantity	Unit	Unit Cost	Subtotal	Cost/Sect	Quantity	Unit	Unit Cost	Subtotal	Cost/Sect
01000	**GENERAL REQUIREMENTS (Assume 17% base construction cost)**					$ 2,686					$ 2,686
	A) Project Management										
	B) Field Personnel/ Supervision										
	C) Construction Documents / Printing										
	D) Quality Control										
	E) Temporary Utilities										
	F) Construction Facilities										
	G) Bond & Insurance										
	H) Temporary Construction										
	1) Scaffolding										
	2) Project sign										
	3) Sidewalk bridge, barrier fencing (Staging area, protection, etc.…)										
	I) Materials Testing										
01000	**HAZARDOUS MATERIALS ABATEMENT**					$ 2,500					$ 2,500
	A) Evaluation	1	L.S.		$ 2,500		1	L.S.		$ 2,500	
	B) Abatement				TBD					TBD	
02000	**SITE WORK**					$ 4,000					$ 4,000
	A) Demolition and hauling										
	1) Salvage or demolish stacked rock walls	1	L.S.		$ 4,000		1	L.S.		$ 4,000	
	2) Demolish pathways	1200	C.F.	$ 1.45	$ 1,740		1200	C.F.	$ 1.45	$ 1,740	
	3) Demolish additions; salvage stone for reuse	2100	S.F.	$ 7.00	$ 14,700		2100	S.F.	$ 7.00	$ 14,700	
	4) Remove trees, as necessary	1	L.S.	$ 3,000.00	$ 3,000		1	L.S.	$ 3,000.00	$ 3,000	
04000	**MASONRY**					$ 2,500					$ 2,500
	A) Stabilize north and west walls	1	L.S.		$ 2,500		1	L.S.		$ 2,500	
05000	**METALS**					$ 1,000					$ 1,000
	A) Repair roof	1	L.S.		$ 1,000		1	L.S.		$ 1,000	
08000	**DOOR & WINDOWS**					$ 400					$ 400
	A) Remove all window awnings	8	Ea.	$ 50.00	$ 400		8	Ea.	$ 50.00	$ 400	
09000	**FINISHES**					$ 1,400					$ 1,400
	A) Remove misc. carpet/gyp. board	1400	S.F.	$ 1.00	$ 1,400		1400	S.F.	$ 1.00	$ 1,400	
15000	**MECHANICAL**					$ 2,500					$ 2,500
	A) Remove or modify any mechanical/plumbing systems	1	L.S.		$ 2,500		1	L.S.		$ 2,500	
16000	**ELECTRICAL**					$ 1,500					$ 1,500
	A) Remove or modify any electrical systems	1	L.S.		$ 1,500		1	L.S.		$ 1,500	
	SUBTOTAL				$ 35,240	$ 18,486				$ 35,240	$ 18,486
	10% GC OVERHEAD & PROFIT					$ 1,849					$ 1,849
	TOTAL CONSTRUCTION (INCLUDES O & P)					$ 20,335					$ 20,335
	10% CHANGE ORDER CONTINGENCY					$ 2,033					$ 2,033
	ESTIMATED FINAL CONSTRUCTION COST					$ 22,368					$ 22,368

* Costs for items in red are not included in the estimated final construction cost because they will be incurred as part of demolition even if the building is demolished. The total for these costs is $19,440.00.

PHASE 2

Phasing Strategy & Estimated Costs

Prior to relocating the building, the new site and travel route must be prepared to accept the building. The new foundation should be constructed of engineered concrete footings. It is preferable to move the building in one piece to preserve the historic and material integrity. Dividing the building would involve splitting the structure across the ridge line and most likely require a new roof and repaired roof structure after relocation. The structural movers consulted have advised that it is feasible and preferable to move the 100-ton building in one piece.

The structural moving costs are similar for the Commons and Park site. The majority of the expense is for getting the building on and off of the vehicle. For the Park Site, a railroad and low water crossing bridge must be crossed via the travel route north on Chisholm Trail. The mover will work with the railroad and bridge authorities to get appropriate permission and permits, cover and protect the rail road tracks, and reinforce the bridge. All moving permits should be the responsibility of the mover and included in the cost. It is ideal to use a structural mover who includes Phase 1 and Phase 2 as a "package" along with the relocation of the structure.

Phase 2: New Site Preparation and Relocation of Historic Building

1. Provide clear path for moving truck to access historic building and the new site. Based on the advice of the structural mover selected and their capabilities, this may include infill to create a pathway to the structure or new site.
2. New Site Preparation
    a. Site work
        - Level the grade.
        - Provide access for the building to move to the site; temporary infill for the truck may be necessary.
        - Pour engineered concrete footing and slab to serve as the building foundation.
        - Depending on the use of the site after relocation, access to utilities may be necessary.

    b. Drainage
        - If the site has negative drainage, swales should be created at sides of the structure.
        - Install splash blocks below downspouts on structure to move water away from the building.

    c. Landscaping
        - No trees, tree branches or shrubs should be within 10' of the building envelope.

    d. Electrical
        - Temporary power connections and security lights
3. Park Site Only: Construction of a ramp over the railroad to protect the tracks. The structural mover will provide this.
4. Park Site Only: Install temporary bracing underneath bridge for additional support. The structural mover will provide this.
5. Park Site Only: A police detail may be required for traffic control during transit.
6. Building relocation via truck in one piece.

Estimate of Probable Cost
Phase 2_New Site Preparation and Historic Building Relocation

		Commons Site					Park Site				
No.	Item	Quantity	Unit	Unit Cost	Subtotal	Cost/Sect	Quantity	Unit	Unit Cost	Subtotal	Cost/Sect
01000	**GENERAL REQUIREMENTS (Assume 17% total construction cost)**					**$ 36,095**					**$ 47,995**
	A) Project Management										
	B) Field Personnel/ Supervision										
	C) Construction Documents / Printing										
	D) Quality Control										
	E) Temporary Utilities										
	F) Construction Facilities										
	G) Bond & Insurance										
	H) Temporary Construction										
	1) Scaffolding										
	2) Project sign										
	3) Sidewalk bridge, barrier fencing (Staging area, protection, etc.…)										
	I) Materials Testing										
02000	**SITE WORK**					**$ 7,350**					**$ 7,350**
	A) Infill pathway to structure	600	S.F.	$ 4.75	$ 2,850		600	S.F.	$ 4.75	$ 2,850	
	B) Level new site, modify grade to properly drain	1	L.S.	$ 4,000.00	$ 4,000		1	L.S.	$ 4,000.00	$ 4,000	
	C) Remove vegetation at least 10' from building exterior at new site	1	L.S.	$ 500.00	$ 500		1	L.S.	$ 500.00	$ 500	
03000	**CONCRETE**					**$ 25,475**					**$ 25,475**
	A) Pour concrete foundation at new site	1295	S.F.	$ 13.00	$ 16,835		1295	S.F.	$ 13.00	$ 16,835	
	B) Concrete perimeter footing	144	L.F.	$ 60.00	$ 8,640		144	S.F.	$ 60.00	$ 8,640	
16000	**ELECTRICAL**					**$ 4,500**					**$ 4,500**
	A) Provide temporary power	1	L.S.	$ 4,500.00	$ 4,500		1	L.S.	$ 4,500.00	$ 4,500	
	BUILDING RELOCATION COST					**$ 175,000**					**$ 246,500**
	A) Building relocation	1	L. S.	$ 175,000.00	$ 175,000		1	L. S.	$ 195,000.00	$ 195,000	
	B) Railroad crossing						1	L. S.	$ 10,000.00	$ 10,000	
	C) Low water bridge crossing						1	L. S.	$ 40,000.00	$ 40,000	
	D) Police detail for traffic control						1	L. S.	$ 1,500.00	$ 1,500	
	SUBTOTAL				$ 212,325	$ 248,420				$ 282,325	$ 331,820
	10% GC OVERHEAD & PROFIT					$ 24,842					$ 33,182
	TOTAL CONSTRUCTION (INCLUDES O & P)					**$ 273,262**					**$ 365,002**
	10% CHANGE ORDER CONTINGENCY					$ 27,326					$ 36,500
	ESTIMATED FINAL CONSTRUCTION COST					**$ 300,589**					**$ 401,503**

PHASE 3

Phasing Strategy & Estimated Costs

Unless an immediate rehabilitation or restoration follows the relocation of the building, it is best practice to stabilize and mothball the Stagecoach Inn at the new site to prevent damage in the meantime. A detailed procedure for mothballing based on recommendations for the preservation of historic architecture by the Department of the Interior is included in Section III. During the stabilization of the building, the existing windows and doors should remain.

It is recommended that the masonry walls be reconstructed at the north, south and west elevations where additions have been removed. At this time, historic openings for windows and doors in these new walls should be constructed. The historic window openings are smaller than the existing windows. Until Phase 4, these window openings can be boarded up and temporary doors can be installed. While a qualified mason is working on the walls, it is also recommended that the exterior mortar joints, many of which are incompatible in color, texture and material, be raked out and repointed.

By the end of this phase, the building will be stable for up to 10 years, with monitoring and periodic maintenance, and, visually, it will be a historic artifact.

Phase 3: Stabilization of Historic Building at New Site and Mothballing of Structure

1. Build/repair/fill masonry exterior walls to match historic material at the south, west and north elevations where additions have been removed or leave temporary wall in place until full restoration. New limestone blocks should have a similar color, texture and tooling as surrounding material. Create openings where windows and doors were historically located.
    a. Patch openings created by beams used for moving the structure and repair/extend the foundation, as needed.
    b. Create two (2) new door openings in the new masonry at the west and south elevations based on historical location. Secure with temporary plywood sheets until Phase 4.
    c. Create four (4) new window openings in masonry at south, north and west elevations based on historical location. Secure with temporary plywood sheets until Phase 4.
2. Reconstruct wood porch at east entrance.
3. Repair roof and drainage system, as necessary.
4. Mothball structure (see “Mothballing of Structure” in Section III).
5. Interpretation and Signage
    a. Install interpretative signage of history.
    b. Install interpretative signage with narrative of relocation and future rehabilitation.
6. Regular Maintenance
    a. Monitor roof conditions and check for leaks on the interior.
    b. Monitor and clean out gutters and downspouts.
    c. Trim vegetation.
    d. Implement a regular pest and moisture management strategy.

Potential Expenses Not Included in Cost Estimate

1. Optional, but recommended: hire an architectural conservator to conduct mortar analysis and determine original mortar mixture and color. (approx. cost: $2,500)

Potential Saving in Immediate Rehabilitation

1. The savings in going straight to a rehabilitation would be approximately 20% to 30% of the total cost. Savings come from temporary doors and window covers, miscellaneous site work, drainage system repair, temporary lighting, passive louvers and dehumidifier. There is also potential cost savings in labor for only one phase, rather than two.

Estimate of Probable Cost
Phase 3_Stabilization of Historic Building at New Site and Mothballing

		Commons Site					Park Site				
No.	Item	Quantity	Unit	Unit Cost	Subtotal	Cost/Sect	Quantity	Unit	Unit Cost	Subtotal	Cost/Sect
01000	**GENERAL REQUIREMENTS (Assume 17% total construction cost)**					**$ 9,781**					**$ 9,781**
	A) Project Management										
	B) Field Personnel/ Supervision										
	C) Construction Documents / Printing										
	D) Quality Control										
	E) Temporary Utilities										
	F) Construction Facilities										
	G) Bond & Insurance										
	H) Temporary Construction										
	1) Scaffolding										
	2) Project sign										
	3) Sidewalk bridge, barrier fencing (Staging area, protection, etc.…)										
	I) Materials Testing										
02000	**SITE WORK**					**$ 1,500**					**$ 1,500**
	A) Modify walkways to entrance of building/misc sitework	1	L.S.	$ 1,500.00	$ 1,500		1	L.S.	$ 1,500.00	$ 1,500	
04000	**MASONRY**					**$ 41,688**					**$ 41,688**
	A) Reconstruct exterior masonry walls where missing or altered	325	S.F.	$ 90.00	$ 29,250		325	S.F.	$ 90.00	$ 29,250	
	B) Rake out 50% exterior mortar joints and repoint	1125	S.F.	$ 7.50	$ 8,438		1125	S.F.	$ 7.50	$ 8,438	
	C) Construct stone platform at main entrance	1	L.S.	$ 4,000.00	$ 4,000		1	L.S.	$ 4,000.00	$ 4,000	
06000	**CARPENTRY**					**$ 3,300**					**$ 3,300**
	A) Reconstruct porch at east entrance	60	S.F.	$ 25.00	$ 1,500		60	S.F.	$ 25.00	$ 1,500	
	B) Rough carpentry										
	1. Cover windows and doors with plywood sheets	12	Ea.	$ 150.00	$ 1,800		12	Ea.	$ 150.00	$ 1,800	
07000	**THERMAL & MOISTURE PROTECTION**					**$ 850**					**$ 850**
	B) Repair drainage system	1	L.S.	$ 500.00	$ 500		1	L.S.	$ 500.00	$ 500	
	C) Install sheet metal chimney caps	2	Ea.	$ 175.00	$ 350		2	Ea.	$ 175.00	$ 350	
08000	**DOOR & WINDOWS**					**$ 1,400**					**$ 1,400**
	A) Install temporary exterior doors	2	Ea.	$ 500.00	$ 1,000		2	Ea.	$ 500.00	$ 1,000	
	B) Secure all doors	2	Ea.	$ 200.00	$ 400		2	Ea.	$ 200.00	$ 400	
10000	**SPECIALITIES**					**$ 2,500**					**$ 2,500**
	A) Pest control	1	L.S.	$ 300.00	$ 300		1	L.S.	$ 300.00	$ 300	
	B) Interpretative signage	1	L.S.	$ 2,200.00	$ 2,200		1	L.S.	$ 2,200.00	$ 2,200	
15000	**MECHANICAL**					**$ 1,800**					**$ 1,800**
	A) Dehumidifier	1	L.S.	$ 1,000.00	$ 1,000		1	L.S.	$ 1,000.00	$ 1,000	
	B) Install two passive metal louvers backed with mesh	2	Ea.	$ 400.00	$ 800		2	Ea.	$ 400.00	$ 800	
16000	**ELECTRICAL**					**$ 4,500**					**$ 4,500**
	A) Provide temporary lighting including security lighting	Allow	L.S.	$ 4,500.00	$ 4,500		Allow	L.S.	$ 4,500.00	$ 4,500	
	SUBTOTAL				$ 57,538	$ 67,319				$ 57,538	$ 67,319
	10% GC OVERHEAD & PROFIT					$ 6,732					$ 6,732
	TOTAL CONSTRUCTION (INCLUDES O & P)					**$ 74,051**					**$ 74,051**
	10% CHANGE ORDER CONTINGENCY					$ 7,405					$ 7,405
	ESTIMATED FINAL CONSTRUCTION COST					**$ 81,456**					**$ 81,456**

PHASE 4

Phasing Strategy & Estimated Costs

Phase 4 of the Stagecoach Inn relocation is variable based on programming needs and interpretation. For this study, the scope of the rehabilitation extends to the exterior structure and basic interior finishes. A strategy for a full interior restoration or rehabilitation should be determined after use and interpretation of the building are decided. Amenities, such as a restroom, may be necessary depending on the intended use, but we recommend this amenity be accommodated in a nearby structure in order to preserve the integrity of the historic building. The building would not, historically, have had indoor rest rooms Because historic interior photographs and documentation are not available for the building, interior wall materials and placement, as well as the roof construction, may depend on the use of the interior space.

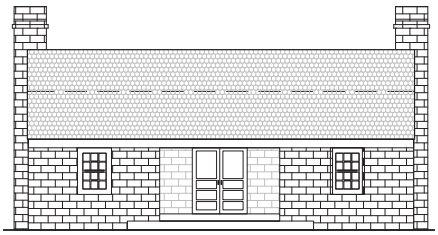
Phase 4: Rehabilitation of Exterior and Interior of Structure

1. Reconstruct and install ten (10) wood windows based on the original six-over-six wood windows. Narrow openings, as needed.
2. Replace all three (3) doors (one double door and two single doors) with new historically appropriate doors.
3. Replace roofing with cedar shingle roofing.
4. Rake out 50% interior mortar joints, as needed. Repoint with type N mortar.
5. Restore chimneys and add mantels.
6. Install interior cedar flooring.
7. Construct interior wall partitions based on programming needs and historic research.
8. Evaluate the need for new MEP systems.
9. Depending on function and accessibility requirements, ADA modifications to the structure may be necessary.
10. Due to the building's limited size, it is not recommended to add rest rooms inside the structure.

Estimate of Probable Cost
Phase 4_Basic Exterior and Interior Rehabilitation of Structure

		Commons Site					Park Site				
No.	**Item**	**Quantity**	**Unit**	**Unit Cost**	**Subtotal**	**Cost/Sect**	**Quantity**	**Unit**	**Unit Cost**	**Subtotal**	**Cost/Sect**
01000	**GENERAL REQUIREMENTS (Assume 17% total construction cost)**					**$ 25,254**					**$ 30,354**
	A) Project Management										
	B) Field Personnel/ Supervision										
	C) Construction Documents / Printing										
	D) Quality Control										
	E) Temporary Utilities										
	F) Construction Facilities										
	G) Bond & Insurance										
	H) Temporary Construction										
	1) Scaffolding										
	2) Project sign										
	3) Sidewalk bridge, barrier fencing (Staging area, protection, etc….)										
	I) Materials Testing										
02000	**SITE WORK**					**$ 21,550**					**$ 51,550**
	B) Integration, interpretation and landscaping	1	L. S.	$ 20,000.00	$ 20,000		1	L.S.	$ 50,000.00	$ 50,000	
	B) Demo sheet metal roofing	1550	S.F.	$ 1.00	$ 1,550		1550	S.F.	$ 1.00	$ 1,550	
04000	**MASONRY**					**$ 11,775**					**$ 11,775**
	A) Rake out interior mortar joints 50% and repoint	850	S.F.	$ 7.50	$ 6,375		850	S.F.	$ 7.50	$ 6,375	
	B) Narrow window and door openings to historic dimensions	30	S.F.	$ 180.00	$ 5,400		30	S.F.	$ 180.00	$ 5,400	
06000	**CARPENTRY**					**$ 29,700**					**$ 29,700**
	A) Provide interior flooring	1000	S.F.	$ 18.00	$ 18,000		1000	S.F.	$ 18.00	$ 18,000	
	B) Provide interior walls	90	L.F.	$ 110.00	$ 9,900		90	L.F.	$ 110.00	$ 9,900	
	C) Provide mantels	2	L.S.	$ 900.00	$ 1,800		2	L.S.	$ 900.00	$ 1,800	
07000	**THERMAL & MOISTURE PROTECTION**					**$ 23,425**					**$ 23,425**
	A) Cedar shingle roofing	1550	S.F.	$ 13.50	$ 20,925		1550	S.F.	$ 13.50	$ 20,925	
	B) Repair gutters and downspouts	1	L.S.	$ 2,500.00	$ 2,500		1	L.S.	$ 2,500.00	$ 2,500	
08000	**DOOR & WINDOWS**					**$ 25,200**					**$ 25,200**
	A) Reconstruct historic six over six wood windows and install	9	Ea.	$ 1,800.00	$ 16,200		9	Ea.	$ 1,800.00	$ 16,200	
	B) Replace exterior doors with historically appropriate alternatives	5	Ea.	$ 1,200.00	$ 6,000		5	Ea.	$ 1,200.00	$ 6,000	
	C) Provide interior doors	6	Ea.	$ 500.00	$ 3,000		6	Ea.	$ 500.00	$ 3,000	
09000	**FINISHES**					**$ 12,000**					**$ 12,000**
	A) Paint and stain		Allow	$ 12,000.00	$ 12,000			Allow	$ 12,000.00	$ 12,000	
10000	**SPECIALITIES**					**$ 300**					**$ 300**
	A) Pest control	1	L.S.		$ 300		1	L.S.		$ 300	
15000	**MECHANICAL**					**$ 14,245**					**$ 14,245**
	A) Update mechanical systems as necessary (*water/plumbing assumed as not part of the project scope)	1295	S.F.	$ 11.00	$ 14,245		1295	S.F.	$ 11.00	$ 14,245	
16000	**ELECTRICAL**					**$ 10,360**					**$ 10,360**
	A) Update electrical systems	1295	S.F.	$ 8.00	$ 10,360		1295	S.F.	$ 8.00	$ 10,360	
	SUBTOTAL				$ 148,555	$ 173,809				$ 178,555	$ 208,909
	10% GC OVERHEAD & PROFIT					$ 17,381					$ 20,891
	TOTAL CONSTRUCTION (INCLUDES O & P)					**$ 191,190**					**$ 229,800**
	10% CHANGE ORDER CONTINGENCY					$ 19,119					$ 22,980
	ESTIMATED FINAL CONSTRUCTION COST					**$ 210,309**					**$ 252,780**

III
Detailed Phasing Strategies



Recommendations for Stabilization/Salvage/ Removal of Existing Structure

Relocation Logistics

Mothballing Procedure

Annotated Elevations - Stabilization Recommendations

Rehabilitation

Restoration

Recommendations for Stabilization/Salvage/ Removal of Existing Structure

The following existing building elements were evaluated to provide recommendations for stabilization, salvage or removal:

Masonry Exterior Walls: The original exterior limestone walls should be retained. Mortar analysis may be undertaken before repointing.

Roof: The standing seam galvanized roof was added in 1994 to replace a wood shingle roof. The metal roof is in good condition and can be retained during the move and mothballing stages, but should be replaced with a historically appropriate cedar shingle roofing once feasible.

Drainage System: There is a system of painted metal gutters and downspouts throughout the building. The existing drainage system on the historic building can be retained during the move and mothballing stages. It should be checked and cleaned as part of regular maintenance at the new location. It should eventually be replaced with a historically accurate half round gutter system.

Windows: The fixed wood windows were added in 1994. These windows can be retained during the move and mothballing stages but should be removed during the full rehabilitation and replaced with historically appropriate six-over-six wood windows (See Historic Plans and Elevations on pages 46-49).

Doors: The existing historic structure has one original entrance, at the east elevation. These nonhistoric doors should be replaced during the full rehabilitation but can remain during the relocation and mothballing stage. They should be adequately secured. Historic photographs show doors at the west and south elevations. These elevations have been altered due to the 20th century additions and will require stabilization after relocation. An additional exterior door should be installed at the west elevation post relocation in the historic location. Currently, there are no interior doors in the historic building and none of the existing doors appear to be historic.

Additions: All additions to the 19th century original building should be demolished. Exterior walls should be evaluated for salvaged historical material.

Stone Walkways and Porches: The stone steps, platforms and inset pavers do not appear to be original. Depending on the landscape of the new site and ease of removal, they could be salvaged and reused. The large stones at the east entrance are particularly attractive.

Stacked Rock Walls: The extensive dry stacked limestone landscape walls were installed between 1907 and 1932 and are not historic to the proposed period of significance. Their salvage needs to be determined by the City of Round Rock based on future programming for the structure and potential for reuse.

MEP Systems: MEP systems should be evaluated by a MEP consultant to see if any can be salvaged and relocated with the historic building, but most likely they will need to be replaced. A/C ducts should be removed from the historic structure.

Partitions and Interior Finishes: The modern interior partitions and finishes should be demolished or removed prior to relocation.

Furniture and Fixtures: The City of Round Rock should determine if the furniture and fixtures should be demolished, salvaged or sold.

Flooring: The carpet should be removed in its entirety. The original flooring is thought to be cedar. Cedar flooring should be installed during the rehabilitation.

Lighting (Exterior and Interior): There are a variety of interior and exterior modern lights in the structure. All modern lights should be removed and replaced with historically appropriate alternatives after relocation.

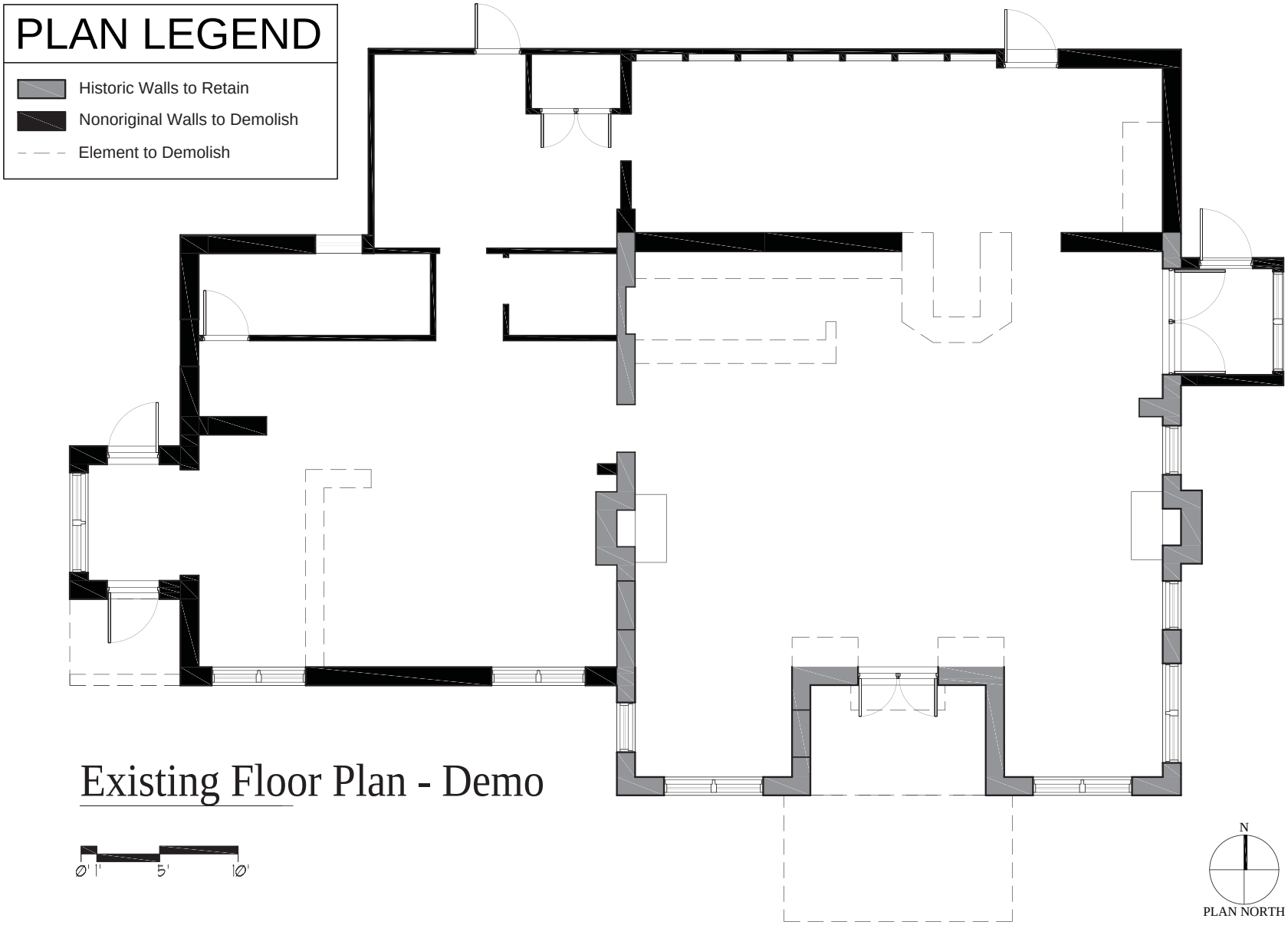


Figure 19. Floor Plan of Existing Structure, noting demolition
(Drawing by ARCHITEXAS, 2016)

Relocation Logistics

Historic Building Relocation

A qualified structural mover should be retained to relocate the Stagecoach Inn. To preserve the integrity of the building, it is recommended that the building be moved in one piece and structural movers have confirmed that this is the most practical choice. Structural moves are complex and once a mover is selected, they can outline the exact plan for moving the structure.

The structural mover will be responsible for permits and, in the case of the Park Site move, will be responsible for logistics of crossing the railroad tracks and bridge.

Structural Movers

To estimate costs, AT consulted the below structural movers. They are familiar with the project and are recommended for the move.

Emmert International
Mark Albrecht
503-655-7191 ext. 250
malbrecht@emmertintl.com

H. D. Snow and Son Moving, Inc.
H. D. Snow
12155 Business Hwy. 287 North
Fort Worth, Texas 76179
817-439-1999

Crossing the Railroad Tracks

To reach the Park Site, the Stagecoach Inn must be moved across a railroad track at Chisholm Trail by the structural movers. The track is part of the Georgetown Industrial Loop owned by the Union Pacific Railroad. The structural mover will build a temporary bridge over the tracks for the vehicle and will coordinate with the railroad on timing and insurance requirements. For safety reasons, the railroad requires a Union Pacific flagger and police escort to be on site for the move. The move has been preliminarily approved by Union Pacific and there will be no costs other than safety support.

1. Ticket #2016-10-11-174 DPM should be referenced when contacting the railroad.
2. Union Pacific requires at least 72 hours notice for the move.
3. A Union Pacific flagger must be on hand for the move. The cost is approximately $2,000 and is included in the cost estimate as part of the railroad crossing to the Park Site.
4. For safety purposes, a police escort is required by the railroad for the move.
5. Union Pacific uses the DOT crossing numbers for the railroad tracks. The crossing at RM 620 is #439705H. For reference, the crossing to the south at Hester's Crossing is #439698A.

Railroad Contact Information

Mac McDonough
Railroad Crossing Corporate Office
888-877-7267

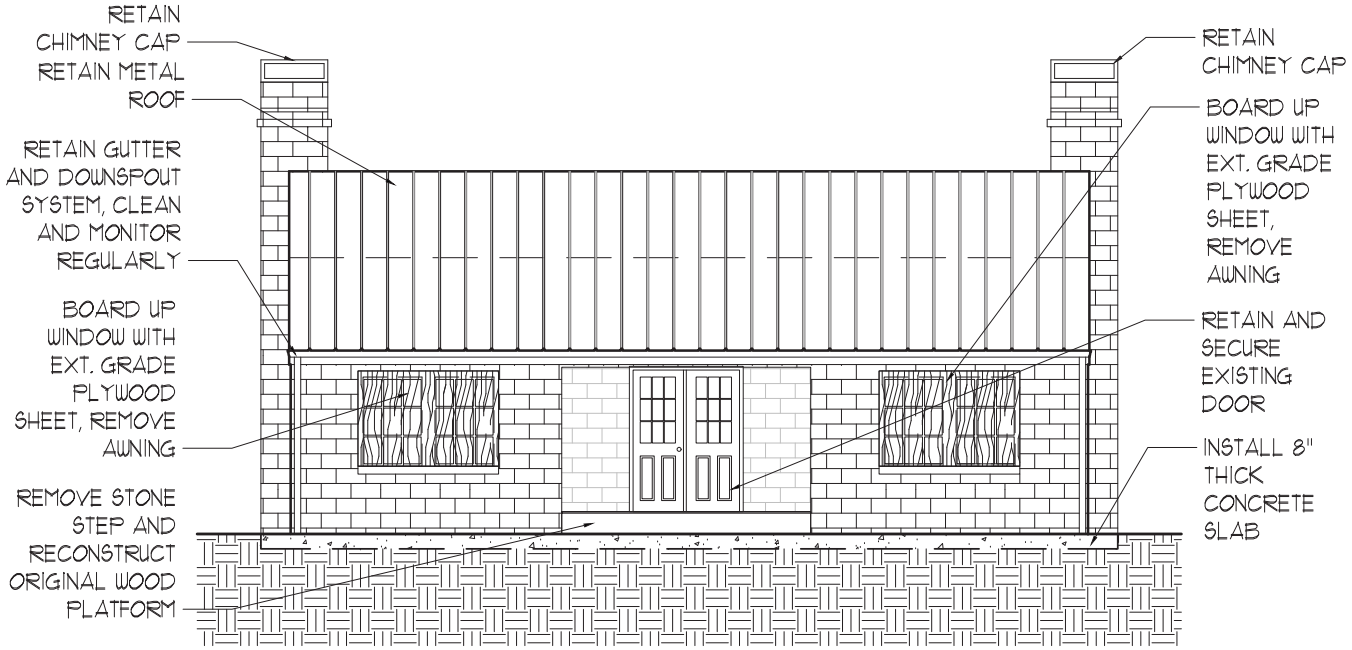
Jose Garcia
Track Maintenance - Local Contact
402-591-2543

Mothballing of Structure After Relocation

National Park Service Preservation Brief 31 “Mothballing Historic Buildings” by Sharon C. Park (see Appendix) outlines steps to protect inactive historic buildings for up to ten years with limited maintenance and monitoring. Vacant historic buildings cannot remain indefinitely, as materials inherently have a finite lifespan, but mothballing is a good option until it can be rehabilitated. Modern materials can be temporarily used for the process.

1. Document the structure at its new site with notes and photographs keyed to a site plan.
    - Document any revealed construction or material conditions exposed during relocation, such as original flooring or wall construction.
    - Inspect the interior flooring and foundation for evidence of historic interior wall partitions.
    - Reevaluate restoration plans based on any newly discovered evidence.
    - Due to the potential longevity of mothballing, maintain easily accessible and complete records of all data for future consultants, contractors or City officials.
2. Prepare a condition assessment of the building after relocation to ensure no damage has occurred and to document conditions prior to mothballing.
3. Stabilize the structure of the building. Refer to Stabilization Drawings on pages 41 through 44 for detailed information.
4. Eliminate and control pests including insects, birds and rodents.
    - The foundation and flooring should be inspected for any insect damage.
    - Close chimney flues with sheet metal caps to prevent pest intrusion.
5. Protect the exterior from moisture penetration.
    - Inspect entire structure, including roof and floor joists for any leaks or tears.
    - Ensure that site is draining appropriately away from the building envelope.
6. Secure the building and its component features to reduce vandalism or break-ins.
    - Mothballed buildings are often boarded up with exterior grade plywood boards to prevent broken window glass or forced entry.
    - The east double doors should be reinforced with strong locks. Per the Stabilization Drawings, a single door should be added to the west elevation and secured with strong locks.
    - The existing windows can remain until rehabilitation begins and should be boarded up with exterior grade plywood.
    - Motion activated security lights can help to secure the area in the evenings.
7. Provide adequate ventilation to the interior.
    - The interior will require ventilation to prevent mold, rot and insect infestation due to rising humidity levels.
    - Passive, louvered panels should be installed per the Stabilization Drawings.
8. Secure or modify utilities and mechanical systems.
    - An evaluation of required utilities and systems is needed.
    - Generally, utilities should remain off if the building is unoccupied.
9. Develop and implement maintenance and monitoring plan for protection.
    - Regular monitoring for moisture intrusion, including leaks, biological growth on masonry or ponding near the structure.
    - Regular monitoring for evidence of pests should be implemented.
    - Monitoring of interior humidity levels.
    - Regular trimming of landscape.

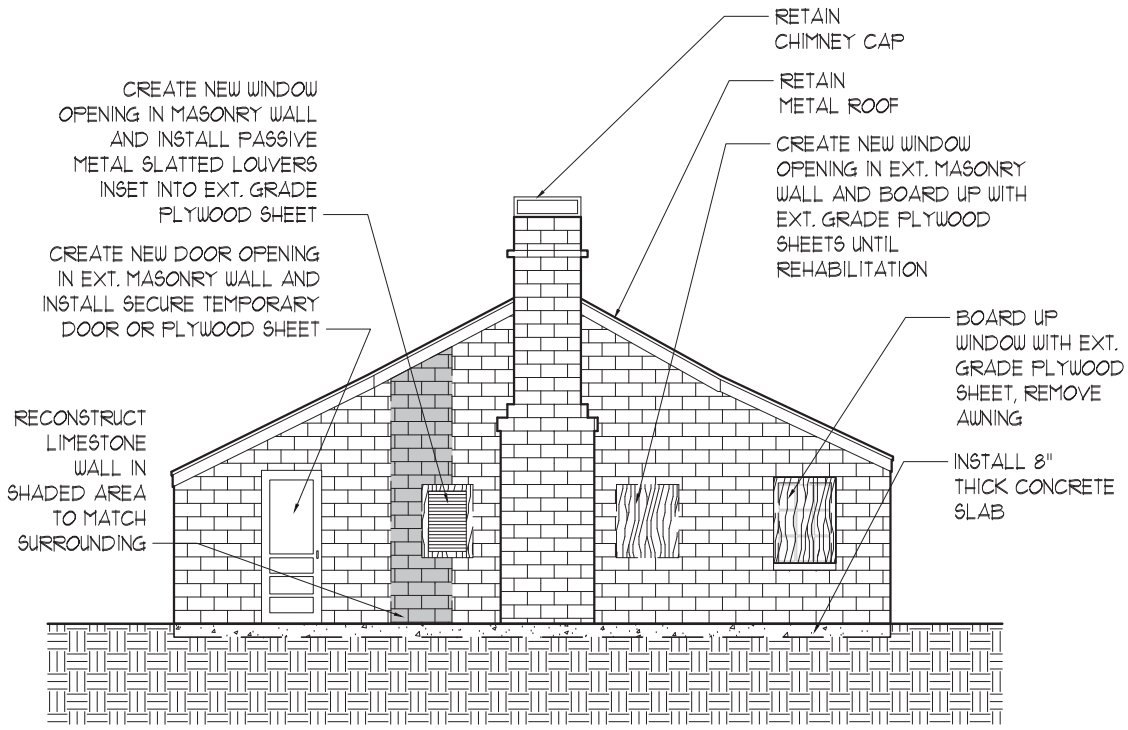
Annotated Elevations - Stabilization Recommendations



Stabilization of Historic East Elevation

NOT FOR CONSTRUCTION

Figure 20. Elevations for Stabilization/Mothballing of East Elevation, after relocation to new site
(Drawing by ARCHITEXAS, 2016)

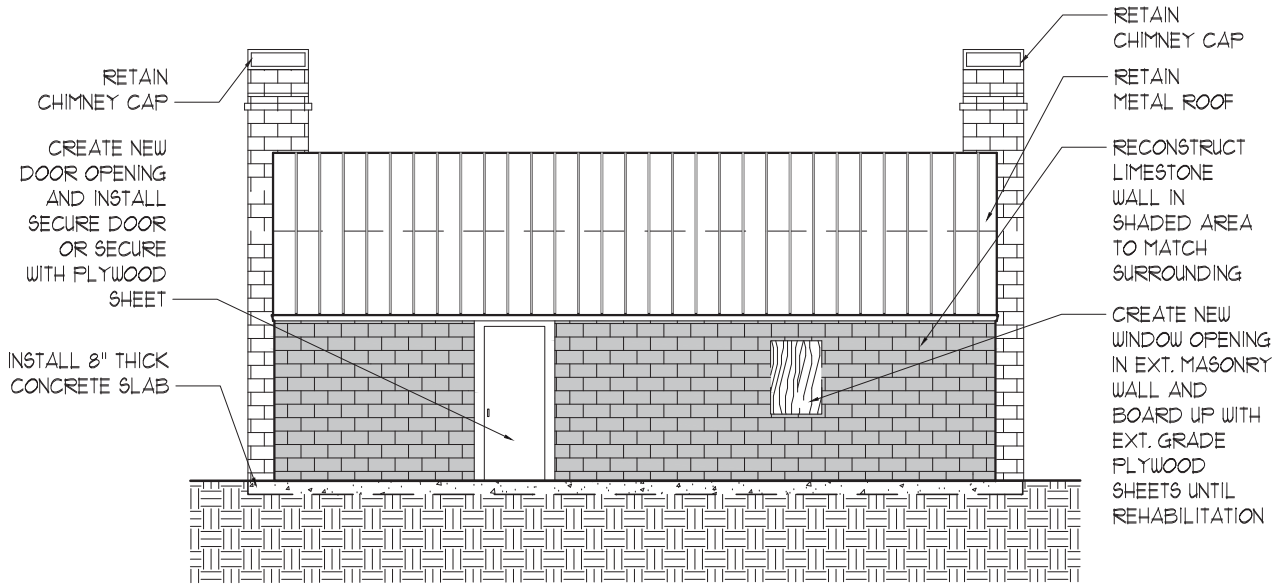


Stabilization of Historic South Elevation

0' 1' 5' 10'

NOT FOR CONSTRUCTION

Figure 21. Elevations for Stabilization/Mothballing of South Elevation, after relocation to new site
(Drawing by ARCHITEXAS, 2016)

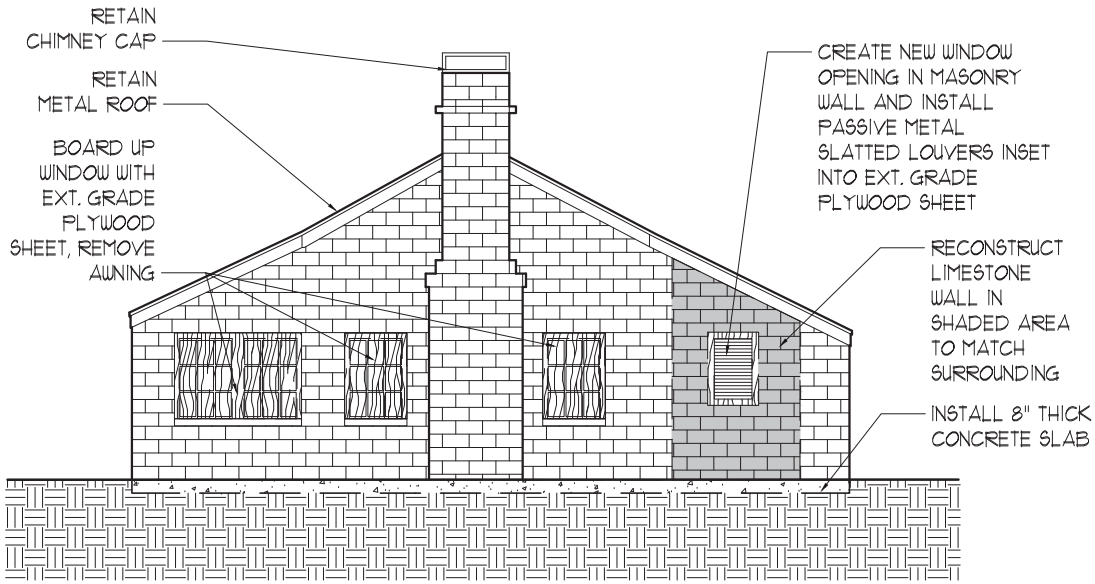


Stabilization of Historic West Elevation

0' 1' 5' 10'

NOT FOR CONSTRUCTION

Figure 22. Elevations for Stabilization/Mothballing of West Elevation, after relocation to new site
(Drawing by ARCHITEXAS, 2016)



Stabilization of Historic North Elevation

NOT FOR CONSTRUCTION

Figure 23. Elevations for Stabilization/Mothballing of North Elevation, after relocation to new site
(Drawing by ARCHITEXAS, 2016)

Rehabilitation of Structure

Once a use has been determined for the Stagecoach Inn, based on funding and programming needs, a basic or full rehabilitation can be undertaken. The scope of a full rehabilitation will be dependent on programming needs and, thus, only a basic rehabilitation has been described and with estimated costs.

1. Site Work
   - Plan and execute the successful integration of the Inn into its new site.
   - Landscape the immediate building site, taking care to keep vegetation at least 12” from the building envelope.
   - Create interpretation tools for the Inn, such as informative signage.
   - * For the Park Site, the Bathing Beach Park architect/planner should be consulted for the site work phase.
2. Masonry
   - Many of the interior mortar joints have been patched with mismatched or inappropriate mortar. Approximately 50% of the mortar joints require a mason to rake out and repoint with a type N mortar. Mortar analysis by an experienced architectural conservator to identify the historic mortar mix is highly recommended in Phase 3.
   - Narrow window and door openings to historic dimensions and patch with masonry, as appropriate.
3. Carpentry
   - Install historically appropriate interior flooring. Historical documentation references cedar floors.
   - Basic framed interior walls and doors can be installed based on functional needs. Two conjectural historical plans have been included on page 46. They are based on historical plans of comparable buildings.
4. Thermal and Moisture Protection
   - Replace the metal roofing with historically appropriate cedar shingle roofing.
   - Repair existing gutters and downspouts.
5. Doors and Windows
   - Install historically appropriate windows. Based on historic photographs and existing wall openings, the dimensions are estimated to be 2’-2” wide by 3’-4” high with a 6” frame around the exterior.
   - Install historically appropriate doors. Based on historic photographs and existing wall openings, the west and south doors are estimated to be 3’ wide by 7’ high and the east double doors are estimated to be 5’ wide by 7’ high.
6. Finishes
   - Finish/stain the flooring.
   - Paint the partition walls, window trim/sashes and doors.
7. Additional Items
   - Implement an integrated pest control system.
   - Update mechanical and electrical systems, as necessary.

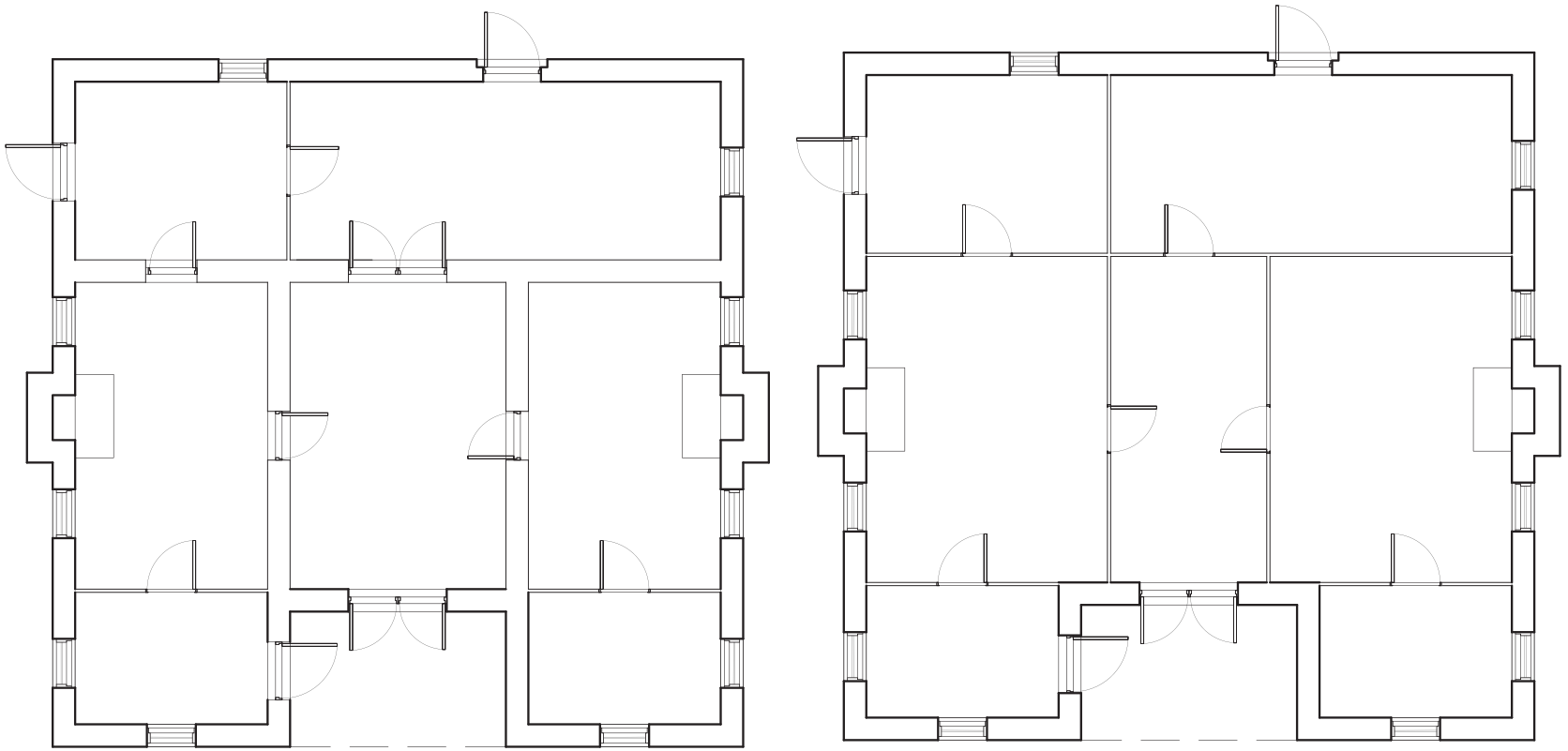
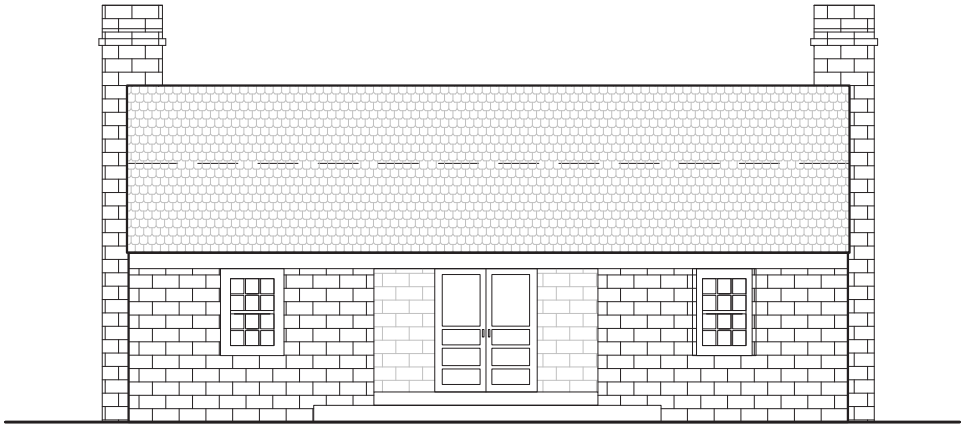


Figure 24. Conjectural Historical Floor Plans
(Drawing by ARCHITEXAS, 2016)

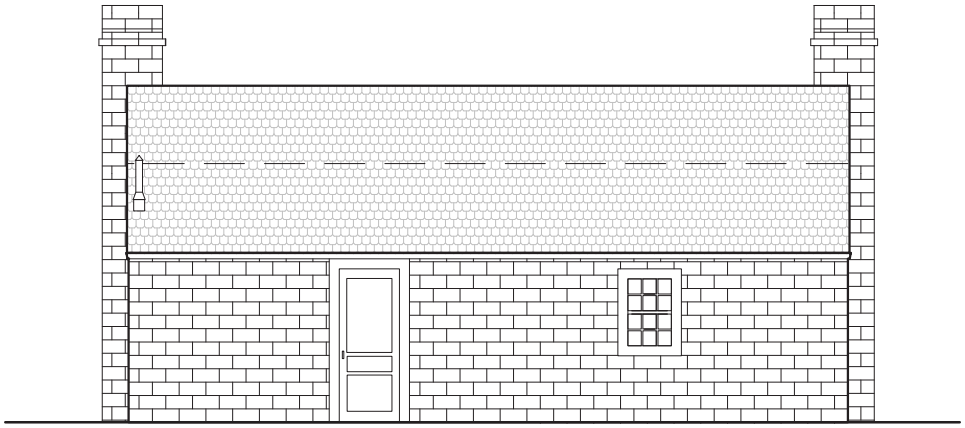
Full Rehabilitation of Structure

To fully rehabilitate the Stagecoach Inn and most accurately depict the proposed period of significance, several additional steps should be undertaken. Many of these will depend on the long-term owner and determined use of the structure.

1. Replace gutters with historically appropriate half-round gutters only on the west elevation.
2. Interpret the evidence of an opening to the south of the main entrance doors. The use of the structure may dictate the interpretation of this element.
3. Interpret the interior plan. There are comparable buildings in Round Rock with masonry interior walls; however, there is no evidence on the interior masonry walls at the Stagecoach Inn or of detached walls. During relocation, evidence of wall footings under the floor slab may be revealed. Because the plan is entirely conjectural, programming may dictate the final interior configuration and wall type.
4. Restore the fireplaces and reconstruct historically appropriate wood mantels.
5. The original roof structure was most likely a pole and rafter system typical of 19th century construction in Texas. There is no evidence of the original structure and a reconstruction will depend on the building use.
6. Reconstruct flue at northwest corner of roof.



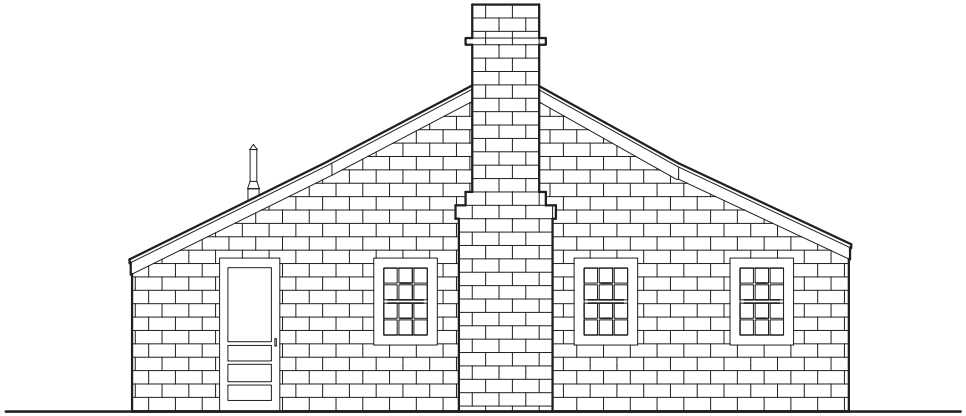
Historic East Elevation



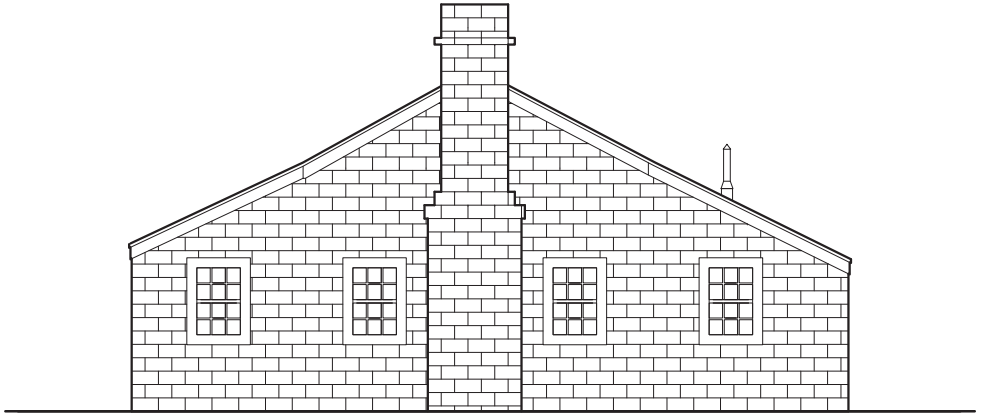
Historic West Elevation

NOT FOR CONSTRUCTION

Figure 25. Historic Building Elevations, East and West
(Drawing by ARCHITEXAS, 2016)



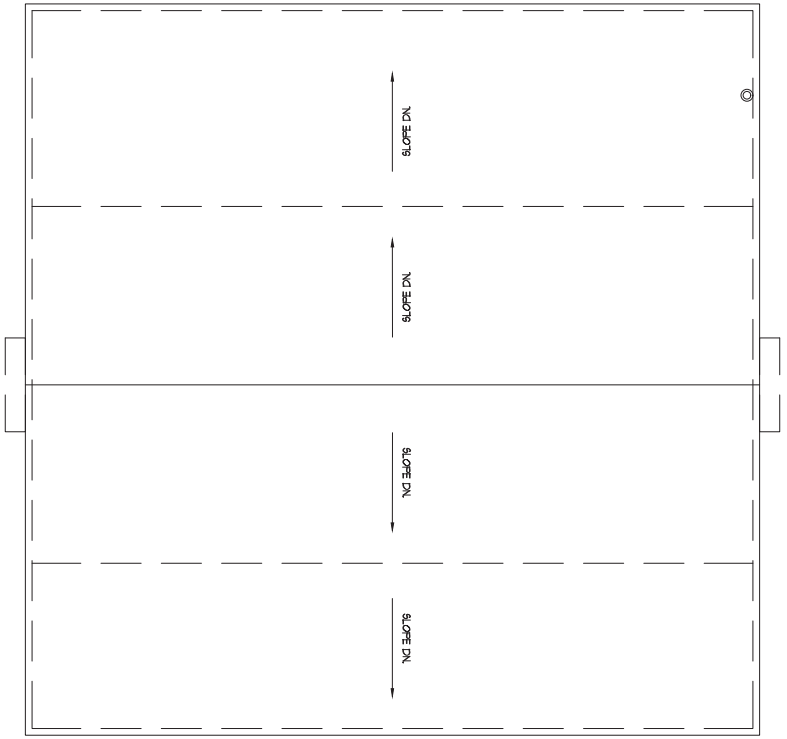
Historic South Elevation



Historic North Elevation

NOT FOR CONSTRUCTION

Figure 26. Historic Building Elevations, North and South
(Drawing by ARCHITEXAS, 2016)



Historic Roof Plan

Figure 27. Historic Roof Plan
(Drawing by ARCHITEXAS, 2016)

IV
Stagecoach Inn Structure

Methodology for Analysis

Existing Conditions Analysis & Recommendations

Existing Plans & Elevations

Methodology for Analysis

The ARCHITEXAS team conducted an investigation and evaluation of the existing exterior and interior conditions of the Stagecoach Inn. The inspection was done to note deficiencies, assess the condition of deterioration to damaged exterior envelope building elements and to provide preservation recommendations and a budget estimate to assist the City of Round Rock with initiating and completing a relocation and rehabilitation of the historic structure.

The conditions of the building envelope were assessed from the exterior by visually reviewing the exterior envelope, windows, roof, and site. The exterior materials were visually assessed from the ground, with the use of binoculars where necessary for the upper portions of the building. The conditions of the building interior, including the finishes, floor, and fixtures, were assessed visually.

The inspection, evaluation and recommendations were conducted based on a format that was established by the National Park Service and has been utilized as a standard system of inspecting and evaluating the condition of National Historic Landmark Buildings.

Definitions

The findings of the investigation are organized into three general categories, Description/Construction, Existing Condition, and Recommendations. The following definitions were used to classify each building condition according to one of three categories.

GOOD: The element is structurally sound and performing its intended purpose, and there are few cosmetic imperfections. Repair is not needed or only minor routine maintenance is required.

FAIR: The element shows early signs of wear, failure or deterioration but remains generally structurally sound and is performing its intended purpose. A failure of a sub-component may have occurred. Replacement of up to 25 percent of the element or replacement of a subcomponent may be required.

POOR: The element is no longer performing its intended purpose, is missing, or has deterioration or damage affecting more than 25 percent of the element. The element may show signs of imminent failure. Major repair or replacement is required.

Existing Conditions Analysis & Recommendations

ELEMENT TYPE

I. SITE

Stacked rock wall at south side

Vegetation and mature trees at east side

Large stones at entryway of east side

Historic photograph showing stone porch at east side

ANALYSIS

Description/Construction:

The Stagecoach Inn is located at the northeast corner of the Commons development at the corner of Round Rock Avenue and Chisholm Trail Road. The site is generally sloping towards the northeast.

Mature deciduous trees and ground cover are located around the perimeter of the building. There is a semi-circle dry stacked limestone wall to the south of the building, and paths constructed of inset rough cut pavers lead to all entrances. Based on historic photographs, the landscaping does not appear to be historic to the period of significance. Most of the landscape walls date from 1907 to 1932.

In front of the main east doors, there is a 14'- 6 1/2" wide by 8' - 1/2" deep stone platform.

Existing Condition:

The dry stacked wall, pavers and front entry are in good condition.

Recommendations:

Many of the trees will need to be removed for access to prepare the building for relocation and for the road improvements.

Depending on the new location, the dry stacked wall could be salvaged and reassembled at the discretion of the City of Round Rock. The pavers are set in a bed of concrete and will not be practical to relocate.

The large stones in front of the east door should be salvaged and moved with the building. Historic photographs show a stone platform in front of this entry and the size of the stones and the large size of the stones indicate that they may be historic.

ELEMENT TYPE

ANALYSIS

II. BUILDING EXTERIOR

1. Exterior Wall Assembly

Change in stone from historic building (left) to new addition (right) at north side

Description/Construction:

The exterior wall of the Stagecoach Inn is constructed of a roughly coursed 1'-2" thick wall of limestone set in a light-beige mortar. The limestone was quarried from the hill on which the building stands and many of the blocks retain original tooling marks. There are limestone fireplaces centered at the gabled ends of the historic structure constructed with the same rough coursing of stone.

The limestone blocks used for the additions are a different size, in general thinner, than the historic building.

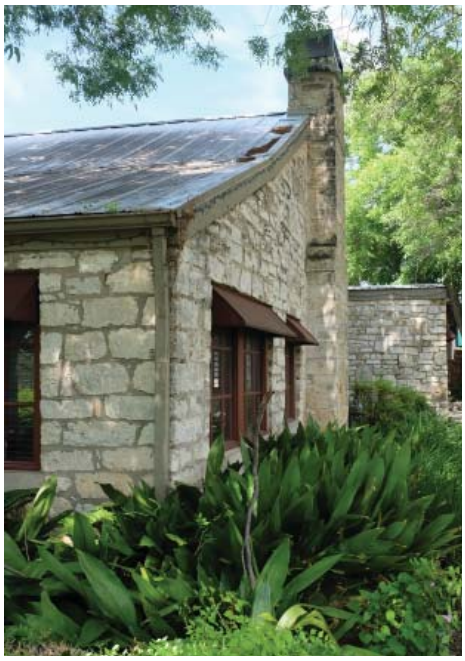
Existing Condition:

The original limestone walls appear to be in good condition. The mortar varies in color and is generally spread over the face of the limestone blocks at the mortar joints.

Recommendations:

The limestone on the additions should be surveyed and evaluated to determine if any was repurposed from demolished historical exterior walls. Any new limestone from the additions should be demolished. It is recommended that a qualified architectural conservator conduct mortar analysis to determine the color and composition of the original mortar for repointing. Generally, a type N mortar is appropriate for exterior limestone.

2. Roof Construction & Drainage



Painted gutters and downspouts at northeast corner

Description/Construction:

Each section of the structure (the historic building, additions and south wing) have a side-gabled, standing seam metal roof of varied heights. The historic structure has a broken gable with extending shed roof towards the west. Historic photographs show a wood shingled roof and it appears that the roof was wood until 1994 when the metal roof was installed. It was postulated in 1994 that the slope of the shed roof was too shallow for a wood shingle roof.

There are painted gutters and downspouts along the perimeter of the building.

Existing Condition:

The roof and drainage system are currently in good condition.

Recommendations:

Ultimately, it is recommended that the roof over the historic structure be replaced with a wood shingle roof. The metal roof on the additions should be demolished with the additions. The main metal roof can remain on the historic building during relocation.

ELEMENT TYPE

ANALYSIS

3. Exterior Door Assembly

Original door opening with modern doors at east elevation; Dotted red outline of possible historic door at left

Description/Construction:

The main entrance is through a set of double doors at the east side of the building. There are single doors at the north and south additions, and two single doors at the west side of the building. The east door is the only original opening and none of the doors appears to be historic.

Existing Condition:

The existing doors are on good condition. Historic photographs show single doors at the west and south sides of the building. These doors were removed when additions were added. There is an outline in the masonry of a single door opening to the south of the main doors.

Recommendations:

It is recommended that all of the door openings be restored when the building is stabilized after relocation. The new doors should be historically appropriate. In historic photographs, it appears that there may have been screen doors; although the historic doors are difficult to clearly see in photographs. The outlined door opening south of the entryway may be interpreted as historic and reconstructed.

4. Exterior Window Assembly

New double casement windows

Description/Construction:

The Stagecoach Inn has fixed wood windows that were installed in 1994. There are three (3) nine-lite windows and six (6) double nine-lite windows. The windows on the north and east side of the building have red awnings over them. At the west side of the building, there is a set of seven (7) fixed wood ribbon windows.

Existing Condition:

The windows are in good condition. Although some of the new window openings are in the same place as the original, none of the windows or the size of the window openings are original. There is evidence of an infilled window opening on the interior of the historic south wall.

Recommendations:

From historic photographs, it appears that originally there were ten (10) wood six-over-six windows approximately 2'-4" wide by 3'-4" high (see Historic Floor Plans on page 46). It is recommended that the historic windows be reconstructed for the building during the full rehabilitation. Initially after the relocation, original window openings should be reinstated when walls are reconstructed. Temporary exterior grade plywood can cover the openings until resources are available for new windows. The existing windows can remain until the full rehabilitation.

ELEMENT TYPE

5. Additions

South additions

North and west additions

ANALYSIS

Description/Construction:

Additions have been added to the north, south and west sides of the building. The historic west exterior wall has been replaced with what appears to be a partition wall, and two window openings on the historic south exterior wall were enclosed.

There are small entry additions to the north and south ends of the building. The additions have limestone walls with distinctly different coursing from the historic structure. At the north end of the building, there is a distinct line between the historic roughly coursed limestone and uncut limestone on the addition exterior wall.

Existing Condition:

The additions are in good condition.

Recommendations:

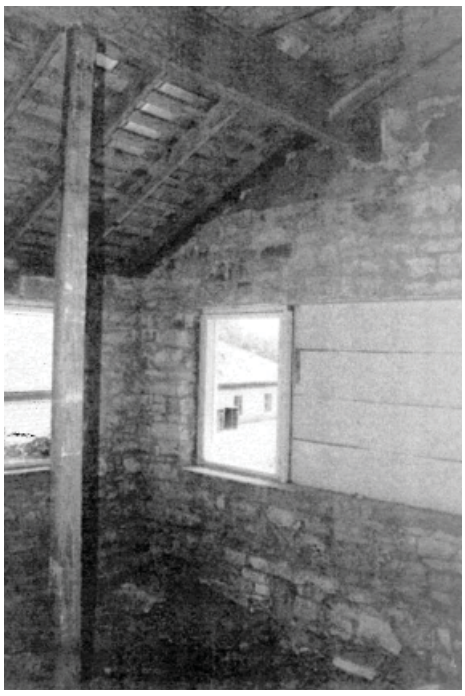
The additions are not original and should be demolished. The interior west wall and the partition wall in the south room do not appear to contain original masonry, but the existing masonry can be selectively salvaged and repurposed for the reconstruction. The west interior wall is gone and can be stabilized with a steel wide flange beam and temporary wall bracing.

ELEMENT TYPE

III. BUILDING INTERIOR
1. Interior Walls, Ceiling & Finishes

Exposed steel I-beam, looking southwest

Exposed roof construction at southeast corner of main room



1990s Restoration showing roof construction
(Source: City of Round Rock)

ANALYSIS

Description/Construction:

The majority of the interior walls are exposed limestone and the partition walls are painted gyp board. The vaulted ceilings and duct work are also clad in painted gyp board.

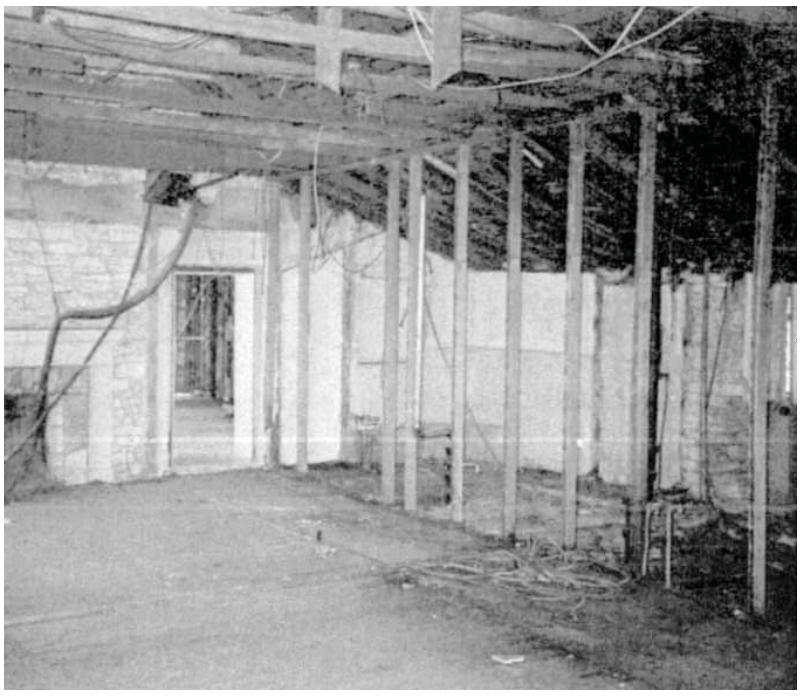
The broken gable of the roof structure is supported at the west side of the room with a steel I-beam and at the east side of the room with a wooden box beam resting on the two extruding masonry walls flanking the main doors.

Existing Condition:

The interior walls and finishes are worn but are in overall good condition. Upon selective removal of the gyp board, the exposed roof structure appears modern and no historical material was visible; however, the roof pitch does appear to be consistent with the historic roof.

Recommendations:

The modern roof construction can be maintained during the move and after relocation. The building most likely originally had a pole and rafter roof construction. Historical documentation mentions beams made of hand-hewn oak. The historic roof construction is beyond the scope of this report and its reconstruction is depending on future programming needs and interpretation philosophies, as they are determined.



1990s Restoration showing roof construction
(Source: City of Round Rock)

ELEMENT TYPE

2. Flooring

Interior carpet at south elevation

1990s Restoration showing removal of flooring
(Source: City of Round Rock)

ANALYSIS

Description/Construction:

The interior is currently covered in a dark carpet. The original floors were cedar, hauled from Brenham in an ox-cart. This flooring was either replaced or covered with oak flooring in the 1950s. Since then, a concrete floor has replaced and reportedly the wood flooring and carpet installed on top of it.

Existing Condition:

The carpet is in poor condition. Photographs from the 1990s renovation appear to show that the wood flooring was completely removed.

Recommendations:

Any existing original or early wood flooring will not be salvageable underneath the concrete slab due to cost and likelihood of the wood having been removed prior to the concrete.

A photograph from 1994 shows a masonry floor that has been demolished prior to pouring concrete. Most likely the wood flooring was removed at this point.

During rehabilitation, cedar flooring should be installed throughout the interior.

ELEMENT TYPE

ANALYSIS

3. Fireplaces

North fireplace with painted mantel and chipped masonry

South fireplace with red lines indicating the outline of an early mantel

Description/Construction:

There are fireplaces at the north and south ends of the historic structure. Modern painted wood mantels are affixed above them.

Existing Condition:

The fireplaces are in fair condition. There is a large chipped stone at the north mantel. There appear to be indications in the mortar joints of where an earlier mantel may have been.

Recommendations:

After relocation, the modern mantels should be removed and eventually replaced with a historically appropriate piece. The fireplaces require cleaning. Metal chimney caps should be placed and maintained on the top of the chimney stacks to avoid water and pest intrusion.

4. Mill Work, Furniture & Fixtures

Built-in bar at south side of historic building

Description/Construction:

There is a variety of furniture and fixtures within the building from its time as a restaurant in the 2000s.

Existing Condition:

The furniture and fixtures are in fair condition.

Recommendations:

All furniture, fixtures and modern mill work should be removed from the structure.

Existing Plans & Elevations

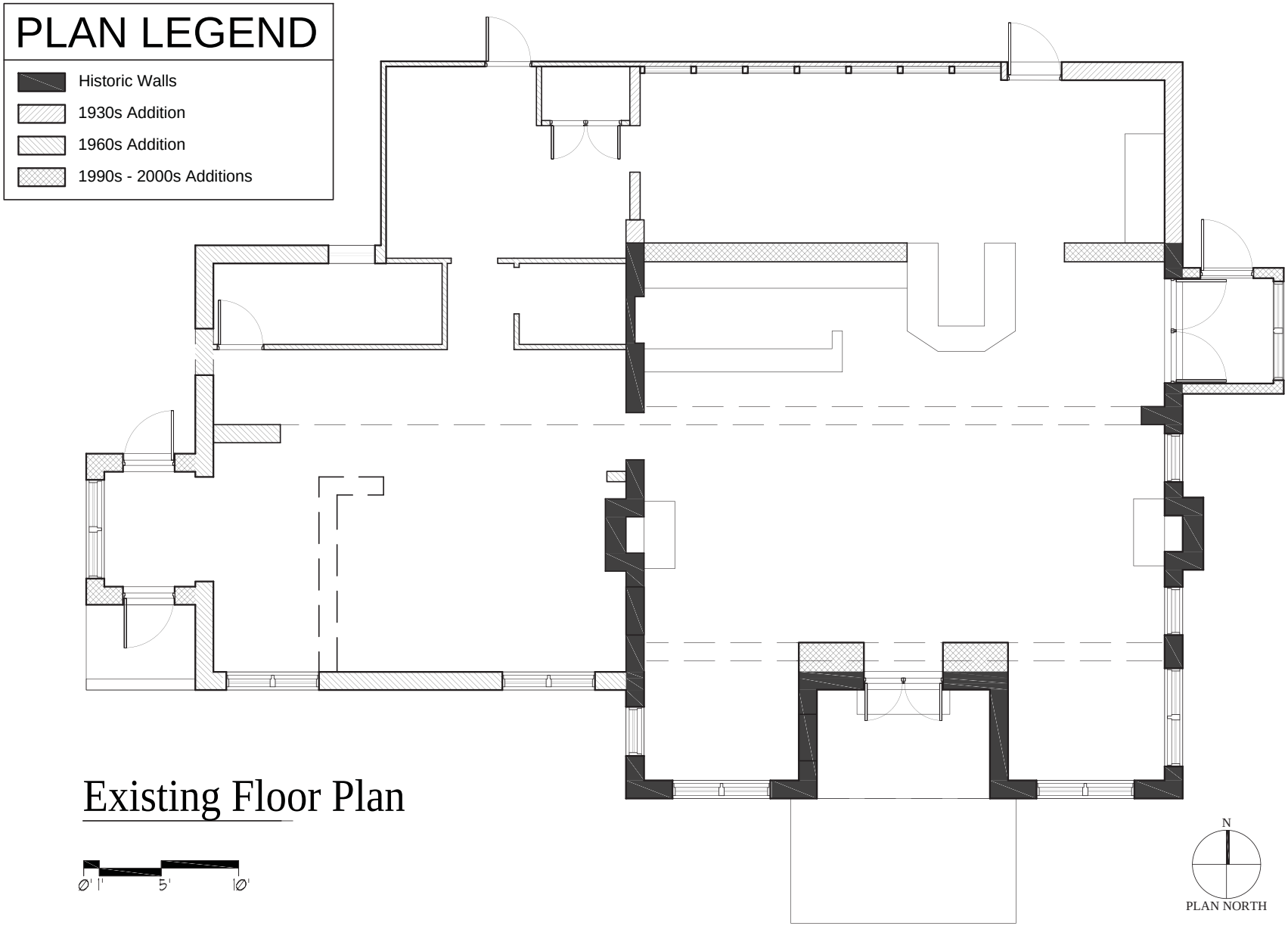
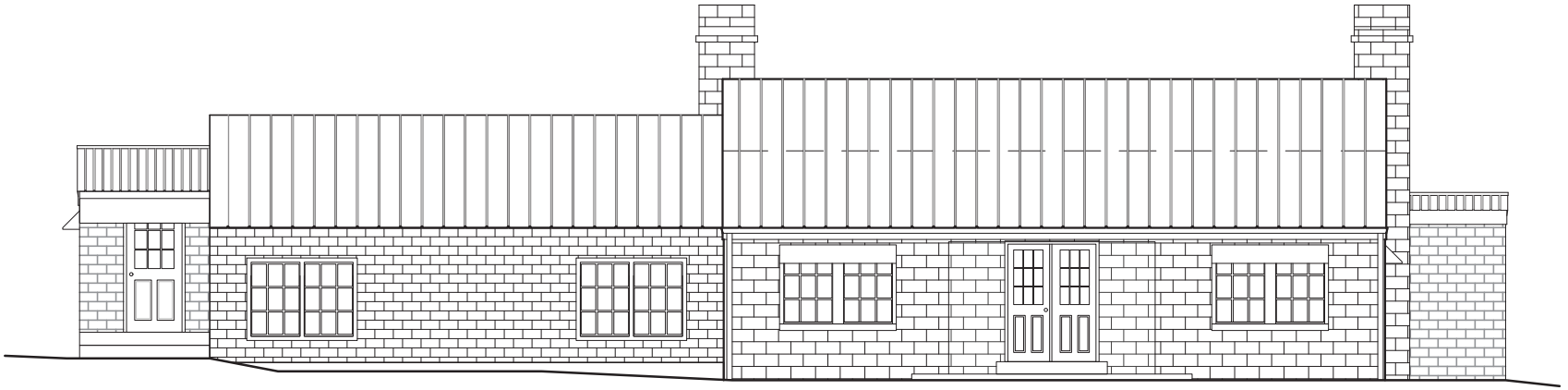
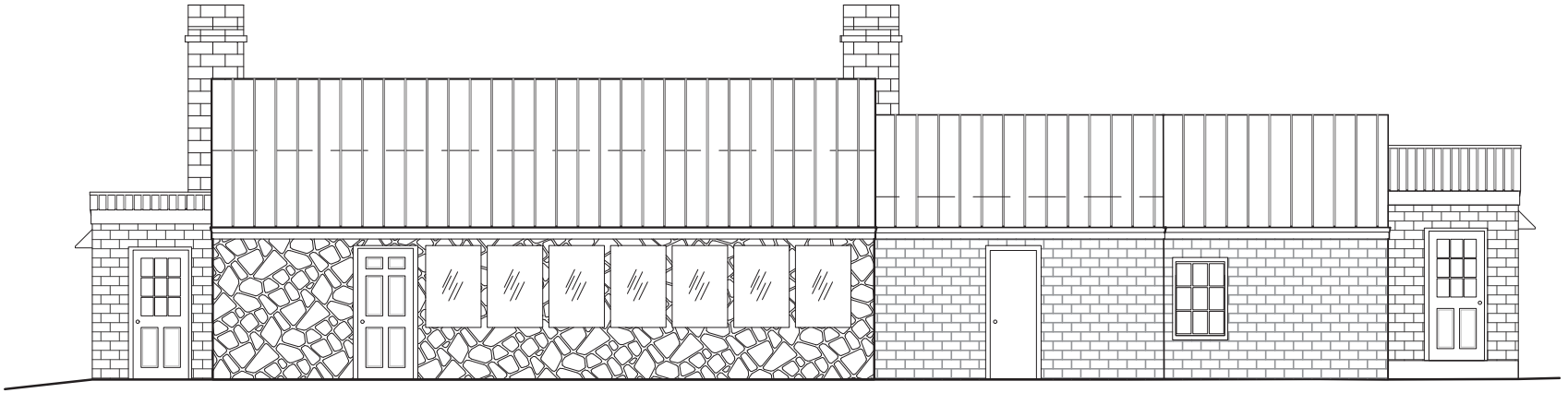


Figure 28. Existing Floor Plan, indicating historic walls
(Drawing by ARCHITEXAS, 2016)

Figure 29. Existing Roof Plan
(Drawing by ARCHITEXAS, 2016)



Existing East Elevation

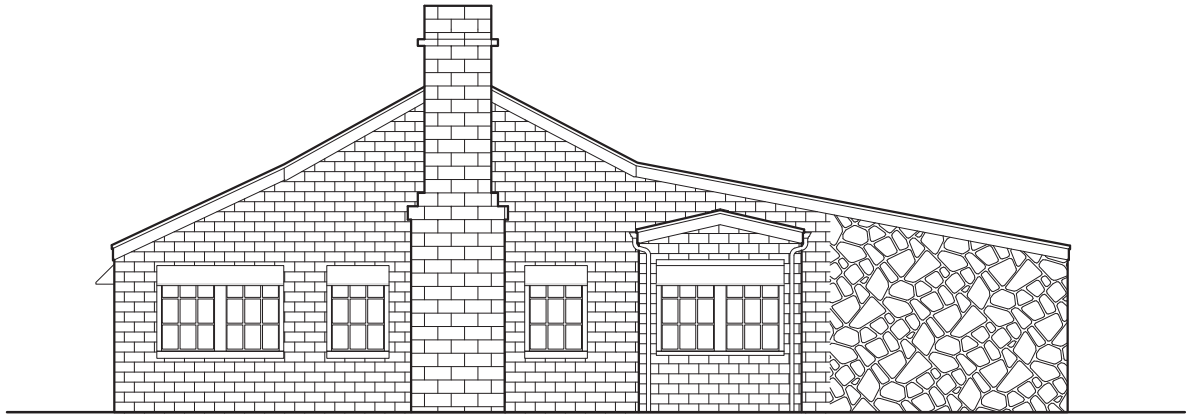


Existing West Elevation

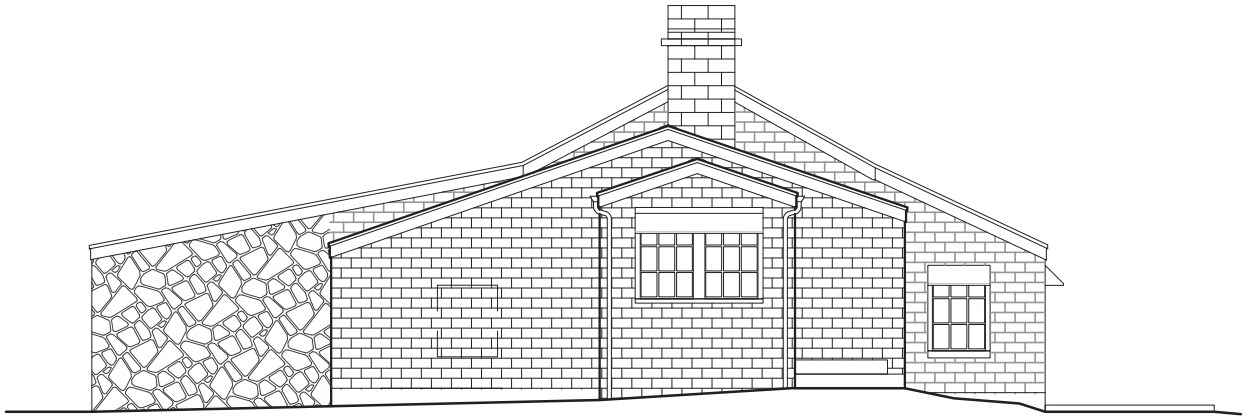
0' 1' 5' 10'

NOT FOR CONSTRUCTION

Figure 30. Existing Elevations, East and West
(Drawing by ARCHITEXAS, 2016)



Existing North Elevation



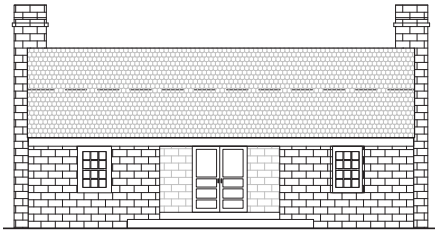
Existing South Elevation

0' 1' 5' 10'

NOT FOR CONSTRUCTION

Figure 31. Existing Elevations, North and South
(Drawing by ARCHITEXAS, 2016)

V
Appendix



Secretary of the Interior's Standards for Rehabilitation

NPS Preservation Brief 31: Mothballing Historic Building

Relevant Historic Research Findings

Relevant Historic Plans

Sources

Glossary of Historical Building Terms

Secretary of the Interior's Standards for the Rehabilitation of Historic Structures

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

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

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

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

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

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

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

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

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

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

NPS Preservation Brief 31: Mothballing Historic Buildings

31 PRESERVATION BRIEFS

Mothballing Historic Buildings

Sharon C. Park, AIA

U.S. Department of the Interior
National Park Service
Cultural Resources
Heritage Preservation Services

When all means of finding a productive use for a historic building have been exhausted or when funds are not currently available to put a deteriorating structure into a useable condition, it may be necessary to close up the building temporarily to protect it from the weather as well as to secure it from vandalism. This process, known as mothballing, can be a necessary and effective means of protecting the building while planning the property's future, or raising money for a preservation, rehabilitation or restoration project. If a vacant property has been declared unsafe by building officials, stabilization and mothballing may be the only way to protect it from demolition.

This Preservation Brief focuses on the steps needed to "de-activate" a property for an extended period of time. The project team will usually consist of an architect, historian, preservation specialist, sometimes a structural engineer, and a contractor. Mothballing should not be done without careful planning to ensure that needed physical repairs are made prior to securing the building. The steps discussed in this Brief can protect buildings for periods of up to ten years; long-term success will also depend on continued, although somewhat limited, monitoring and maintenance. For all but the simplest projects, hiring a team of preservation specialists is recommended to assess the specific needs of the structure and to develop an effective mothballing program.

A vacant historic building cannot survive indefinitely in a boarded-up condition, and so even marginal interim uses where there is regular activity and monitoring, such as a caretaker residence or non-flammable storage, are generally preferable to mothballing. In a few limited cases when the vacant building is in good condition and in a location where it can be watched and checked regularly, closing and locking the door, setting heat levels at just above freezing, and securing the windows may provide sufficient protection for a period of a few years. But if long-term mothballing is the only remaining option, it must be done properly (see fig. 1 & 2). This will require stabilization of the exterior, properly designed security protection, generally some form of interior ventilation - either through mechanical or natural air exchange systems - and continued maintenance and surveillance monitoring.

Figure 1. Proper mothballing treatment: This building has been successfully mothballed for 10 years because the roof and walls were repaired and structurally stabilized, ventilation louvers were added, and the property is maintained. Photo: Charles E. Fisher, NPS.

Comprehensive mothballing programs are generally expensive and may cost 10% or more of a modest rehabilitation budget. However, the money spent on well-planned protective measures will seem small when amortized over the life of the resource. Regardless of the location and condition of the property or the funding available, the following 9 steps are involved in properly mothballing a building:

Figure 2. Improper treatment: Boarding up without adequate ventilation, lack of maintenance, and neglect of this property have accelerated deterioration. Photo; NPS file.

Documentation

1. Document the architectural and historical significance of the building.
2. Prepare a condition assessment of the building.

Stabilization

3. Structurally stabilize the building, based on a professional condition assessment.
4. Exterminate or control pests, including termites and rodents.
5. Protect the exterior from moisture penetration.

Mothballing

6. Secure the building and its component features to reduce vandalism or break-ins.
7. Provide adequate ventilation to the interior.
8. Secure or modify utilities and mechanical systems.
9. Develop and implement a maintenance and monitoring plan for protection.

These steps will be discussed in sequence below. Documentation and stabilization are critical components of the process and should not be skipped over. Mothballing measures should not result in permanent damage, and so each treatment should be weighed in terms of its reversibility and its overall benefit.

Documentation

Documenting the historical significance and physical condition of the property will provide information necessary for setting priorities and allocating funds. The project team should be cautious when first entering the structure if it has been vacant or is deteriorated. It may be advisable to shore temporarily areas appearing to be structurally unsound until the condition of the structure can be fully assessed (see fig. 3). If pigeon or bat droppings, friable asbestos or other health hazards are present, precautions must be taken to wear the appropriate safety equipment when first inspecting the building. Consideration should be given to hiring a firm specializing in hazardous waste removal if these highly toxic elements are found in the building.

Documenting and recording the building. Documenting a building's history is important because evidence of its true age and architectural significance may not be readily evident. The owner should check with the State Historic Preservation Office or local preservation commission for assistance in researching the building. If the building has never been researched for listing in the National Register of Historic Places or other historic registers, then, at a minimum, the following should be determined:

- The overall historical significance of the property and dates of construction;
- the chronology of alterations or additions and their approximate dates; and,
- types of building materials, construction techniques, and any unusual detailing or regional variations of craftsmanship.

Old photographs can be helpful in identifying early or original features that might be hidden under modern materials. On a walk-through, the architect, historian, or preservation specialist should identify the architecturally significant elements of the building, both inside and out (see fig.4).

Figure 3. Buildings seriously damaged by storms or deterioration may need to be braced before architectural evaluations can be made. Jethro Coffin House. Photo: John Milner Architects.

Figure 4. Documenting the building's history, preparing schematic plans, and assessing the condition of the building will provide necessary information on which to set priorities for stabilization and repair prior to securing the building. Photo: Frederick Lindstrom, HABS.

By understanding the history of the resource, significant elements, even though deteriorated, may be spared the trash pile. For that reason alone, any materials removed from the building or site as part of the stabilization effort should be carefully scrutinized and, if appearing historic, should be photographed, tagged with a number, inventioried, and safely stored, preferably in the building, for later retrieval (see fig. 5).

A site plan and schematic building floor plans can be used to note important information for use when the building is eventually preserved, restored, or rehabilitated. Each room should be given a number and notations added to the plans regarding the removal of important features to storage or recording physical treatments undertaken as part of the stabilization or repair.

Because a mothballing project may extend over a long period of time, with many different people involved, clear records should be kept and a building file established. Copies of all important data, plans, photographs, and lists of consultants or contractors who have worked on the property should be added to the file as the job progresses.

Figure 5. Loose or detached elements should be identified, tagged and stored, preferably on site. Photo: NPS files.

Recording all actions taken on the building will be helpful in the future.

The project coordinator should keep the building file updated and give duplicate copies to the owner. A list of emergency numbers, including the number of the key holder, should be kept at the entrance to the building or on a security gate, in a transparent vinyl sleeve.

Preparing a condition assessment of the building. A condition assessment can provide the owner with an accurate overview of the current condition of the property. If the building is deteriorated or if there are significant interior architectural elements that will need special protection during the mothballing years, undertaking a condition assessment is highly recommended, but it need not be exhaustive.

A modified condition assessment, prepared by an architect or preservation specialist, and in some case a structural engineer, will help set priorities for repairs necessary to stabilize the property for both the short and long-term. It will evaluate the age and condition of the following major elements: foundations; structural systems; exterior materials; roofs and gutters; exterior porches and steps; interior finishes; staircases; plumbing, electrical, mechanical systems; special features such as chimneys; and site drainage.

To record existing conditions of the building and site, it will be necessary to clean debris from the building and to remove unwanted or overgrown vegetation to expose foundations. The interior should be emptied of its furnishing (unless provisions are made for mothballing these as well), all debris removed, and the interior swept with a broom. Building materials too deteriorated to repair, or which have come detached, such as moldings, balusters, and decorative plaster, and which can be used to guide later preservation work, should be tagged, labeled and saved.

Photographs or a videotape of the exterior and all interior spaces of the resource will provide an invaluable record of "as is" conditions. If a videotape is made, oral commentary can be provided on the significance of each space and architectural feature. If 35mm photographic prints or slides are made, they should be numbered, dated, and appropriately identified. Photographs should be cross-referenced with the room numbers on the schematic plans. A systematic method for photographing should be developed; for example, photograph each wall in a room and then take a corner shot to get floor and ceiling portions in the picture. Photograph any unusual details as well as examples of each window and door type.

For historic buildings, the great advantage of a condition assessment is that architectural features, both on the exterior as well as the interior, can be rated on a scale of their importance to the integrity and significance of the building. Those features of the highest priority should receive preference when repairs or protection measures are outlined as part of the mothballing process. Potential problems with protecting these features should be identified so that appropriate interim solutions can be selected. For example, if a building has always been heated and if murals, decorative plaster walls, or examples of patterned wall paper are identified as highly significant, then special care should be taken to regulate the interior climate and to monitor it adequately during the

mothballing years. This might require retaining electrical service to provide minimal heat in winter, fan exhaust in summer, and humidity controls for the interior.

Stabilization

Stabilization as part of a mothballing project involves correcting deficiencies to slow down the deterioration of the building while it is vacant. Weakened structural members that might fail altogether in the forthcoming years must be braced or reinforced; insects and other pests removed and discouraged from returning; and the building protected from moisture damage both by weatherizing the exterior envelope and by handling water run-off on the site. Even if a modified use or caretaker services can eventually be found for the building, the following steps should be addressed.

Structurally stabilizing the building. While bracing may have been required to make the building temporarily safe for inspection, the condition assessment may reveal areas of hidden structural damage. Roofs, foundations, walls, interior framing, porches and dormers all have structural components that may need added reinforcement. Structural stabilization by a qualified contractor should be done under the direction of a structural engineer or a preservation specialist to ensure that the added weight of the reinforcement can be sustained by the building and that the new members do not harm historic finishes (see fig. 6). Any major vertical post added during the stabilization should be properly supported and, if necessary, taken to the ground and underpinned.

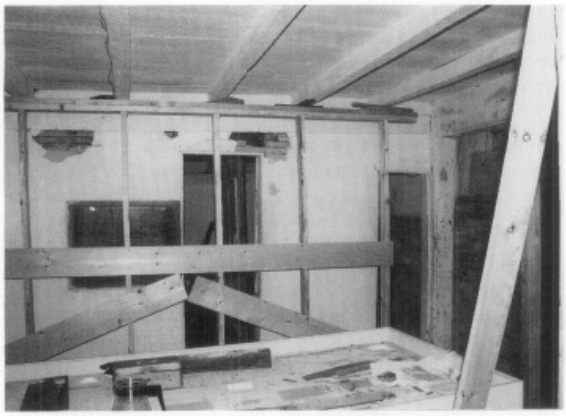


Figure 6. Interior bracing which will last the duration of the mothballing will protect weakened structural members. Jethro Coffin House. Photo: John Milner Architects.

If the building is in a northern climate, then the roof framing must be able to hold substantial snow loads. Bracing the roof at the ridge and mid-points should be considered if sagging is apparent. Likewise, interior framing around stair openings or under long ceiling spans should be investigated. Underpinning or bracing structural piers weakened by poor drainage patterns may be a good precaution as well. Damage caused by insects, moisture, or from other causes should be repaired or reinforced and, if possible, the source of the damage removed. If features such as porches and dormers are so severely deteriorated that they must be removed, they should be documented, photographed, and portions salvaged for storage prior to removal.

If the building is in a southern or humid climate and termites or other insects are a particular problem, the foundation and floor framing should be inspected to ensure that there are no major structural weaknesses. This can usually be done by observation from the crawl space or basement. For those structures where this is not possible, it may be advisable to lift selective floor boards to expose the floor framing. If there is evidence of pest damage, particularly termites, active colonies should be treated and the structural members reinforced or replaced, if necessary.

Controlling pests. Pests can be numerous and include squirrels, raccoons, bats, mice, rats, snakes, termites, moths, beetles, ants, bees and wasps, pigeons, and other birds. Termites, beetles, and carpenter ants destroy wood. Mice, too, gnaw wood as well as plaster, insulation, and electrical wires. Pigeon and bat droppings not only damage wood finishes but create a serious and sometimes deadly health hazard.

If the property is infested with animals or insects, it is important to get them out and to seal off their access to the building. If necessary, exterminate and remove any nests or hatching colonies. Chimney flues may be closed off with exterior grade plywood caps, properly ventilated, or protected with framed wire screens. Existing vents, grills, and louvers in attics and crawl spaces should be screened with bug mesh or heavy duty wire, depending on the type of pest being controlled. It may be advantageous to have damp or infected wood treated with insecticides (as permitted by each state) or preservatives, such as borate, to slow the rate of deterioration during the time that the building is not in use.

Securing the exterior envelope from moisture penetration. It is important to protect the exterior envelope from moisture penetration before securing the building. Leaks from deteriorated or damaged roofing, from around windows and doors, or through deteriorated materials, as well as ground moisture from improper site run-off or rising damp at foundations, can cause long-term damage to interior finishes and structural systems. Any serious deficiencies on the exterior, identified in the condition assessment, should be addressed.

To the greatest extent possible, these weatherization efforts should not harm historic materials. The project budget may not allow deteriorated features to be fully repaired or replaced in-kind. Non-historic or modern materials may be used to cover historic surfaces temporarily, but these treatments should not destroy valuable evidence necessary for future preservation work. Temporary modifications should be as visually compatible as possible with the historic building.

Roofs are often the most vulnerable elements on the building exterior and yet in some ways they are the easiest element to stabilize for the long term, if done correctly. "Quick fix" solutions, such as tar patches on slate roofs, should be avoided as they will generally fail within a year or so and may accelerate damage by trapping moisture. They are difficult to undo later when more permanent repairs are undertaken. Use of a tarpaulin over a leaking roof should be thought of only as a very temporary

Figure 7. Non-historic materials are appropriate for mothballing projects when they are used to protect historic evidence remaining for future preservation. This lightweight aluminum channel frame and roofing covers the historic wooden shingle roof. Galvanized mesh panels secure the window openings from intrusion by raccoons and other unwanted guests. Photo: Williamsport Preservation Training Center, NPS.

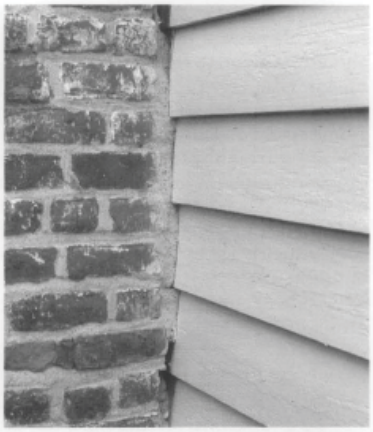


Figure 8. Appropriate mortar mixes should be used when masonry repairs are undertaken. In this case, a soft lime based mortar is used as an infill between the brick and wooden elements. When full repairs are made during the restoration phase, this soft mortar can easily be removed and missing bricks replaced.

emergency repair because it is often blown off by the wind in a subsequent storm.

If the existing historic roof needs moderate repairs to make it last an additional ten years, then these repairs should be undertaken as a first priority. Replacing cracked or missing shingles and tiles, securing loose flashing, and reanchoring gutters and downspouts can often be done by a local roofing contractor. If the roof is in poor condition, but the historic materials and configuration are important, a new temporary roof, such as a lightweight aluminum channel system over the existing, might be considered (see fig. 7). If the roofing is so deteriorated that it must be replaced and a lightweight aluminum system is not affordable, various inexpensive options might be considered. These include covering the existing deteriorated roof with galvanized corrugated metal roofing panels, or 90 lb. rolled roofing, or a rubberized membrane (refer back to cover photo). These alternatives should leave as much of the historic sheathing and roofing in place as evidence for later preservation treatments.

For masonry repairs, appropriate preservation approaches are essential. For example, if repointing deteriorated brick chimneys or walls is necessary to prevent serious moisture penetration while the building is mothballed, the mortar should match the historic mortar in composition, color, and tooling. The use of hard portland cement mortars or vapor-impermeable waterproof coatings are not appropriate solutions as they can cause extensive damage and are not reversible treatments (see fig. 8).

For wood siding that is deteriorated, repairs necessary to keep out moisture should be made; repainting is generally warranted. Cracks around windows and doors can be beneficial in providing ventilation to the interior and so should only be caulked if needed to keep out bugs and moisture. For very deteriorated wall surfaces on wooden frame structures, it may be necessary to sheathe in plywood panels, but care should be taken to minimize installation damage by planning the location of the nailing or screw patterns or by installing panels over a frame of battens (see fig. 9). Generally, however, it is better to repair deteriorated features than to cover them over.

Foundation damage may occur if water does not drain away from the building. Run-off from gutters and downspouts should be directed far away from the foundation wall by using long flexible extender pipes equal in length to twice the depth of the basement or crawl space. If underground drains are susceptible to clogging, it is recommended that the downspouts be disconnected from the drain boot and attached to flexible piping. If gutters and downspouts are in bad condition, replace them with inexpensive aluminum units.

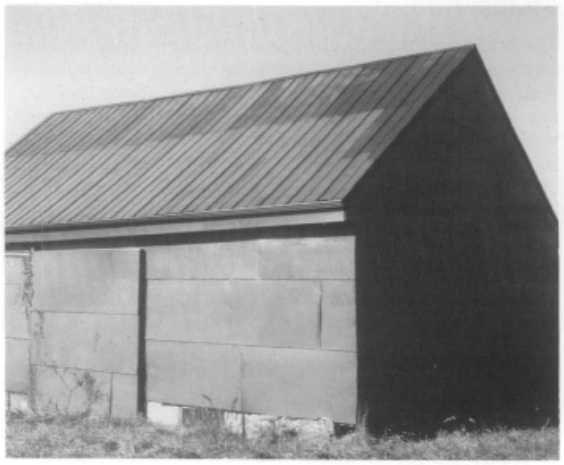


Figure 9. Severely deteriorated wooden siding on a farm building has been covered over with painted plywood panels as a temporary measure to eliminate moisture penetration to the interior. Foundation vents and loose floor boards allow air to circulate inside.

If there are no significant landscape or exposed archeological elements around the foundation, consideration should be given to regrading the site if there is a documented drainage problem (see fig. 10). If building up the grade, use a fiber mesh membrane to separate the new soil from the old and slope the new soil 6 to 8 feet (200 cm-266 cm) away from the foundation making sure not to cover up the dampcourse layer or come into contact with skirting boards. To keep vegetation under control, put down a layer of 6 mil black polyethylene sheeting or fiber mesh matting covered with a 2"-4" (5-10 cm.) of washed gravel. If the building suffers a serious rising damp problem, it may be advisable to eliminate the plastic sheeting to avoid trapping ground moisture against foundations.

Figure 10. Regrading around the Booker Tenement at Colonial Williamsburg has protected the masonary foundation wall from excessive damp. This building has been successfully mothballed for over 10 years. Note the attic and basement vents, the temporary stairs, and the informative sign interpreting the history of this building.

Mothballing

The actual mothballing effort involves controlling the long-term deterioration of the building while it is unoccupied as well as finding methods to protect it from sudden loss by fire or vandalism. This requires securing the building from unwanted entry, providing adequate ventilation to the interior, and shutting down or modifying existing utilities. Once the building is de-activated or secured, the long-term success will depend on periodic maintenance and surveillance monitoring.

Securing the building from vandals, break-ins, and natural disasters. Securing the building from sudden loss is a critical aspect of mothballing. Because historic buildings are irreplaceable, it is vital that vulnerable entry points are sealed. If the building is located where fire and security service is available then it is highly recommeded that some form of monitoring or alarm devices be used.

To protect decorative features, such as mantels, lighting fixtures, copper downspouts, iron roof cresting, or stained glass windows from theft or vandalism, it may be advisable to temporarily remove them to a more secure location if they cannot be adequately protected within the structure.

Mothballed buildings are usually boarded up, particularly on the first floor and basement, to protect fragile glass windows from breaking and to reinforce entry points (see fig. 11). Infill materials for closing door and window openings include plywood, corrugated panels, metal grates, chain fencing, metal grills, and cinder or cement blocks (see fig. 12). The method of installation should not result in the destruction of the opening and all associated sash, doors, and frames should be protected or stored for future reuse.

Figure 11. Urban buildings often need additional protection from unwanted entry and graffiti. This commercial building uses painted plywood panels to cover expansive glass storefronts and chain link fencing is applied on top of the panels. The upper windows on the street sides have been covered and painted to resemble 19th century sash. Photo: Thomas Jester, NPS.

Generally exterior doors are reinforced and provided with strong locks, but if weak historic doors would be damaged or disfigured by adding reinforcement or new locks, they may be removed temporarily and replaced with secure modern doors (see fig. 13). Alternatively, security gates in a new metal frame can be installed within existing door openings, much like a storm door, leaving the historic door in place. If plywood panels are installed over door openings, they should be screwed in place, as opposed to nailed, to avoid crowbar damage each time the panel is removed. This also reduces pounding vibrations from hammers and eliminates new nail holes each time the panel is replaced.

For windows, the most common security feature is the closure of the openings; this may be achieved with wooden or pre-formed panels or, as needed, with metal sheets or concrete blocks. Plywood panels, properly installed to protect wooden frames and properly ventilated, are the preferred treatment from a preservation standpoint.

There are a number of ways to set insert plywood panels into windows openings to avoid damage to frame and sash (see fig. 14). One common method is to bring the upper and lower sash of a double hung unit to the mid-point of the opening and then to install pre-cut plywood panels using long carriage bolts anchored into horizontal wooden bracing, or strong backs, on the inside face of the window. Another means is to build new wooden blocking frames set into deeply recessed openings, for example in an industrial mill or warehouse, and then to affix the plywood panel to

the blocking frame. If sash must be removed prior to installing panels, they should be labeled and stored safely within the building.

Plywood panels are usually 1/2"-3/4" (1.25-1.875 cm.) thick and made of exterior grade stock, such as CDX, or marine grade plywood. They should be painted to protect them from delamination and to provide a neater appearance. These panels may be painted to resemble operable windows or treated decoratively (see fig. 15). With extra attention to detail, the plywood panels can be

Figure 12. First floor openings have been filled with cinderblocks and doors, window sash and frames have been removed for safe keeping. Note the security light over the windows and the use of a security metal door with heavy duty locks. Photo: H. Ward Jandl, NPS.

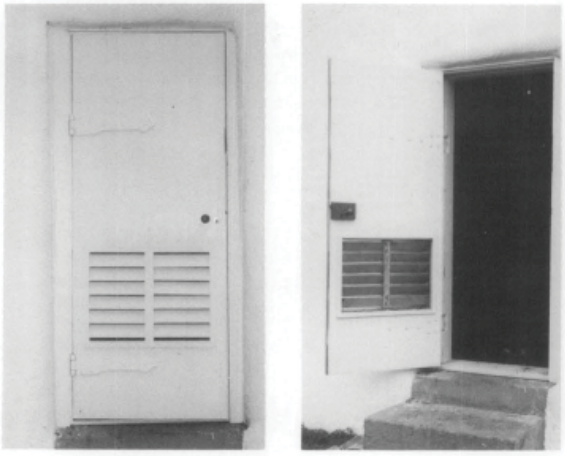


Figure 13. If historic doors would be damaged by adding extra locks, they should be removed and stored and new security doors added. At this lighthouse, the historic door has been replaced with a new door (seen both inside and outside) with an inset vent and new deadbolt locks. The heavy historic hinges have not been damaged. Photo: Williamsport Preservation Training Center, NPS.

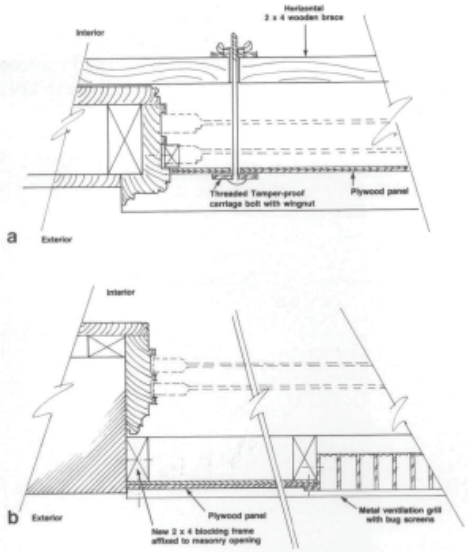


Figure 14. A: Plan detail showing plywood security panel anchored with carriage bolts through to the inside horizontal bracing, or strong backs. B: Plan detail showing section of plywood window panel attached to a new pressure treated wood frame set within the masonry opening. Ventilation should be included whenever possible or necessary.

Figure 15. Painting trompe l'oeil scenes on plywood panels is a neighborhood friendly device. In addition, the small sign at the bottom left corner gives information for contacting the organization responsible for the care of the mothballed building. Photo: Lee H. Nelson, FAIA.

trimmed out with muntin strips to give a shadow line simulating multi-lite windows. This level of detail is a good indication that the building is protected and valued by the owner and the community.

If the building has shutters, simply close the shutters and secure them from the interior (see fig. 16). If the building had shutters historically, but they are missing, it may be appropriate to install new shutters, even in a modern material, and secure them in the closed position. Louvered shutters will help with interior ventilation if the sash are propped open behind the shutters.

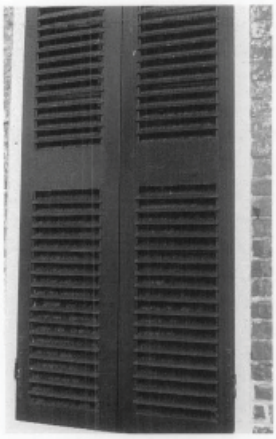


Figure 16. Historic louvered shutters make excellent security closures with passive ventilation.

There is some benefit from keeping windows unboarded if security is not a problem. The building will appear to be occupied, and the natural air leakage around the windows will assist in ventilating the interior. The presence of natural light will also help when periodic inspections are made. Rigid polycarbonate clear storm glazing panels may be placed on the window exterior to protect against glass breakage. Because the sun's ultraviolet rays can cause fading of floor finishes and wall surfaces, filtering pull shades or inexpensive curtains may be options for reducing this type of deterioration for significant interiors. Some acrylic sheeting comes with built-in ultraviolet filters.

Securing the building from catastrophic destruction from fire, lightning, or arson will require additional security devices. Lightning rods properly grounded should be a first consideration if the building is in an area susceptible to lightning storms. A high security fence should also be installed if the property cannot be monitored closely. These interventions do not require a power source for operation. Since many buildings will not maintain electrical power, there are some devices available using battery packs, such as intrusion alarms, security lighting, and smoke detectors which through audible horn alarms can alert nearby neighbors. These battery packs must be replaced every 3 months to 2 years, depending on type and usage. In combination with a cellular phone, they can also provide some level of direct communication with police and fire departments.

If at all possible, new temporary electric service should be provided to the building (see fig. 17). Generally a telephone

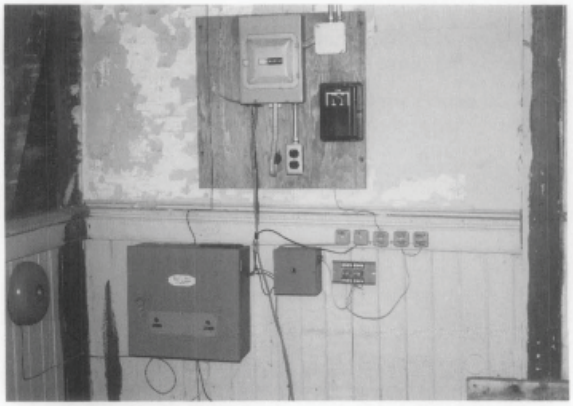


Figure 17. Security systems are very important for mothballed buildings if they are located where fire and security services are available. A temporary electric service with battery back-up has been installed in this building. Intrusion alarms and ionization smoke/fire detectors are wired directly to the nearby security service.

line is needed as well. A hard wired security system for intrusion and a combination rate-of-rise and smoke detector can send an immediate signal for help directly to the fire department and security service. Depending on whether or not heat will be maintained in the building, the security system should be designed accordingly. Some systems cannot work below 32°F (0°C). Exterior lighting set on a timer, photo electric sensor, or a motion/infra-red detection device provides additional security.

Providing adequate ventilation to the interior. Once the exterior has been made weathertight and secure, it is essential to provide adequate air exchange throughout the building. Without adequate air exchange, humidity may rise to unsafe levels, and mold, rot, and insect infestation are likely to thrive (see fig. 18). The needs of each historic resource must be individually evaluated because there are so many variables that affect the performance of each interior space once the building has been secured. A

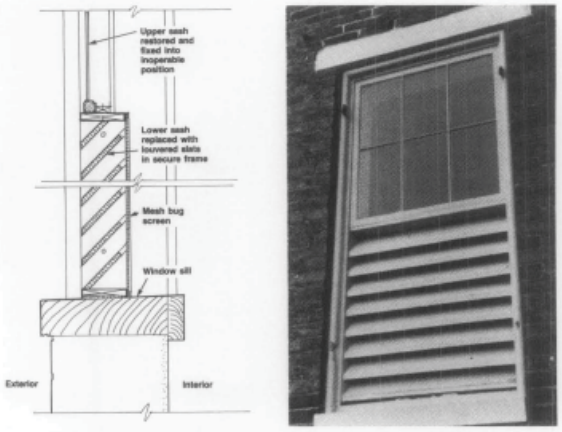


Figure 18. Heavy duty wooden slated louvers were custom fabricated to replace the deteriorated lower sash. The upper sash were rebuilt to retain the historic appearance and to allow light into this vacant historic building. Refer back to Fig. 1 for a view of the building. Photo: Charles E. Fisher, NPS. Drawing by Thomas Vitanza.

mechanical engineer or a specialist in interior climates should be consulted, particularly for buildings with intact and significant interiors. In some circumstances, providing heat during the winter, even at a minimal 45° F (7°C), and utilizing forced-fan ventilation in summer will be recommended and will require retaining electrical service. For masonry buildings it is often helpful to keep the interior temperature above the spring dew point to avoid damaging condensation. In most buildings it is the need for summer ventilation that outweighs the winter requirements.

Many old buildings are inherently leaky due to loose-fitting windows and floorboards and the lack of insulation. The level of air exchange needed for each building, however, will vary according to geographic location, the building's construction, and its general size and configuration.

There are four critical climate zones when looking at the type and amount of interior ventilation needed for a closed up building: hot and dry (southwestern states); cold and damp (Pacific northwest and northeastern states); temperate and humid (Mid-Atlantic states, coastal areas); and hot and humid (southern states and the tropics). (See fig. 19 for a chart outlining guidance on ventilation.)

Once closed up, a building interior will still be affected by the temperature and humidity of the exterior. Without proper ventilation, moisture from condensation may occur and cause damage by wetting plaster, peeling paint, staining woodwork, warping floors, and in some cases even causing freeze thaw damage to plaster. If moist conditions persist in a property, structural damage can result from rot or returning insects attracted to moist conditions. Poorly mothballed masonry buildings, particularly in damp and humid zones have been so damaged on the interior with just one year of unventilated closure that none of the interior finishes were salvageable when the buildings were rehabilitated.

The absolute minimum air exchange for most mothballed buildings consists of one to four air exchanges every hour; one or two air exchanges per hour in winter and often twice that amount in summer. Even this minimal exchange may foster mold and mildew in damp climates, and so monitoring the property during the stabilization period and after the building has been secured will provide useful information on the effectiveness of the ventilation solution.

There is no exact science for how much ventilation should be provided for each building. There are, however, some general rules of thumb. Buildings, such as adobe structures, located in hot and arid climates may need no additional ventilation if they have been well weatherized and no moisture is penetrating the interior. Also frame buildings with natural cracks and fissures for air infiltration may have a natural air exchange rate of 3 or 4 per hour, and so in arid as well as temperate climates may need no additional ventilation once secured. The most difficult

VENTILATION GUIDANCE CHART

CLIMATE	AIR EXCHANGES		VENTILATION				
Temperature and Humidity	Winter air exchange per hour	Summer air exchange per hour	Frame Buildings passive louvering % of openings louvered winter	Frame Buildings passive louvering % of openings louvered summer	Masonry Buildings passive louvering % of openings louvered winter	Masonry Buildings passive louvering % of openings louvered summer	Masonry Buildings fan combination one fan + % louvered summer
hot and dry Southwestern areas	less than 1	less than 1	N/A	N/A	N/A	N/A	N/A
cold and damp Northeastern & Pacific northwestern areas	1	2-3	5%	10%	10%	30%	20%
temperate/humid Mid-Atlantic & coastal areas	2	3-4	10%	20%	20%	40%	30%
hot and humid Southern states & tropical areas	3	4 or more	20%	30%	40% or more	80%	40% or more

Figure 19. This is a general guide for the amount of louvering which might be expected for a medium size residential structure with an average amount of windows, attic, and crawl space ventilation. There is currently research being done on effective air exchanges, but each project should be evaluated individually. It will be noticed from the chart that summer louvering requirements can be reduced with the use of an exhaust fan. Masonry buildings need more ventilation than frame buidings. Chart prepared by Sharon C. Park, AIA and Ernest A. Conrad, PE.

buildings to adequately ventilate without resorting to extensive louvering and/or mechanical exhaust fan systems are masonry buildings in humid climates. Even with basement and attic vent grills, a masonry building many not have more than one air exchange an hour. This is generally unacceptable for summer conditions. For these buildings, almost every window opening will need to be fitted out with some type of passive, louvered ventilation.

Depending on the size, plan configuration, and ceiling heights of a building, it is often necessary to have louvered opening equivalent to 5%-10% of the square footage of each floor. For example, in a humid climate, a typical 20'x30' (6.1m x 9.1m) brick residence with 600 sq. ft.(55.5 sq.m) of floor space and a typical number of windows, may need 30-60 sq. ft.(2.75sq.m-5.5 sq. m) of louvered openings per floor. With each window measuring 3'x5'(.9m x 1.5 m) or 15 sq. ft. (1.3 sq.m), the equivalent of 2 to 4 windows per floor may need full window louvers.

Small pre-formed louvers set into a plywood panel or small slit-type registers at the base of inset panels generally cannot provide enough ventilation in most moist climates to offset condensation, but this approach is certainly better than no louvers at all. Louvers should be located to give cross ventilation, interior doors should be fixed ajar at least 4" (10cm) to allow air to circulate, and hatches to the attic should be left open.

Monitoring devices which can record internal temperature and humidity levels can be invaluable in determining if the internal climate is remaining stable. These units can be powered by portable battery packs or can be wired into electric service with data downloaded into laptop computers periodically (see fig. 20). This can also give long-term information throughout the mothballing years. If it is determined that there are inadequate air exchanges to keep interior moisture levels under control, additional passive ventilation can be increased, or, if there is electric service, mechanical exhaust fans can be installed. One fan in a small to medium sized building can reduce the amount of louvering substantially.

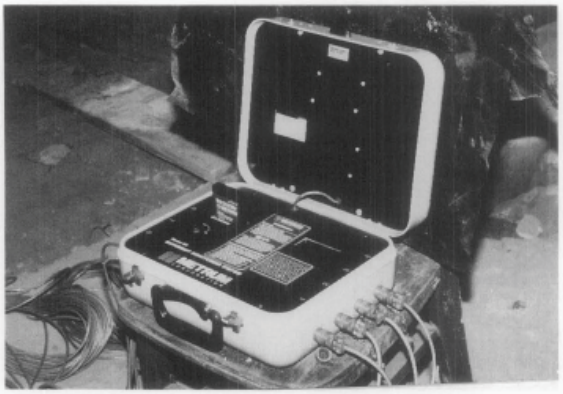


Figure 20. Portable monitors used to record temperature and humidity conditions in historic buildings during mothballing can help identify ventilation needs. This data can be downloaded directly into a lap top computer on site. These monitors are especially helpful over the long term for buildings with significant historic interiors or which are remaining furnished. If interiors are remaining damp or humid, additional ventilation should be added or the source of moisture controlled.

If electric fans are used, study the environmental conditions of each property and determine if the fans should be controlled by thermostats or automatic timers. Humidistats, designed for enclosed climate control systems, generally are difficult to adapt for open mothballing conditions. How the system will draw in or exhaust air is also important. It may be determined that it is best to bring dry air in from the attic or upper levels and force it out through lower basement windows (see fig. 21). If the basement is damp, it may be best to zone it from the rest of the building and exhaust its air separately. Additionally, less humid day air is preferred over damper night air, and this can be controlled with a timer switch mounted to the fan.

The type of ventilation should not undermine the security of the building. The most secure installations use custom-made grills well anchored to the window frame, often set in plywood security panels. Some vents are formed using heavy millwork louvers set into existing window openings (refer back to fig.18). For buildings where security is not a primary issue, where the interior is modest, and where there has been no heat for a long time, it may be possible to use lightweight galvanized metal grills in the window openings (refer back to fig.7). A cost effective grill can be made from the expanded metal mesh lath used by plasterers and installed so that the mesh fins shed rainwater to the exterior.

Securing mechanical systems and utilities. At the outset, it is important to determine which utilities and services, such as electrical or telephone lines, are kept and which are cut off. As long as these services will not constitute a fire

Figure 21. This electric thermostat/humidistat mounted in the attic vent controls a modified ducted air/fan system. The unit uses temporary exposed sheet metal ducts to pull air through the building and exhaust it out of the basement. For over ten years this fan system in combination with 18" x 18" preformed louvers in selective windows has kept the interior dry and with good air exchanges.

hazard, it is advisable to retain those which will help protect the property. Since the electrical needs will be limited in a vacant building, it is best to install a new temporary electric line and panel (100 amp) so that all the wiring is new and exposed. This will be much safer for the building, and allows easy access for reading the meter (see fig. 22).

Most heating systems are shut down in long term mothballing. For furnaces fueled by oil, there are two choices for dealing with the tank. Either it must be filled to the top with oil to eliminate condensation or it should be drained. If it remains empty for more than a year, it will likely rust and not be reusable. Most tanks are drained if a newer type of system is envisioned when the building is put back into service. Gas systems with open flames should be turned off unless there is regular maintenance and frequent surveillance of the property. Gas lines are shut off by the utility company.

If a hot water radiator system is retained for low levels of heat, it generally must be modified to be a self-contained system and the water supply is capped at the meter. This recirculating system protects the property from extensive damage from burst pipes. Water is replaced with a water/glycol mix and the reserve tank must also be filled with this mixture. This keeps the modified system from freezing, if there is a power failure. If water service is cut off, pipes should be drained. Sewerage systems will require special care as sewer gas is explosive. Either the traps must be filled with glycol or the sewer line should be capped off at the building line.

Figure 22. All systems except temporary electric have been shut off at this residence which has been mothballed over 20 years. An electric meter and 100 amp panel box have been set on a plywood panel at the front of the building. It is used for interior lighting and various alarm systems. The building, however, is showing signs of moisture problems with efflorescent stains on the masonry indicating the need for gutter maintenance and additional ventilation for the interior. The vegetation on the walls, although picturesque, traps moisture and is damaging to the masonry. Photo: H. Ward Jandl, NPS.

Developing a maintenance and monitoring plan. While every effort may have been made to stabilize the property and to slow the deterioration of materials, natural disasters, storms, undetected leaks, and unwanted intrusion can still occur. A regular schedule for surveillance, maintenance, and monitoring should be established: (See fig. 23 for maintenance chart).

MAINTENANCE CHART

periodic
- ❑ regular drive by surveillance
- ❑ check attic during storms if possible

monthly walk arounds
- ❑ check entrances
- ❑ check window panes for breakage
- ❑ mowing as required
- ❑ check for graffiti or vandalism

enter every 3 months to air out
- ❑ check for musty air
- ❑ check for moisture damage
- ❑ check battery packs and monitoring equipment
- ❑ check light bulbs
- ❑ check for evidence of pest intrusion

every 6 months; spring and fall
- ❑ site clean-up; pruning and trimming
- ❑ gutter and downspout check
- ❑ check crawlspace for pests
- ❑ clean out storm drains

every 12 months
- ❑ maintenance contract inspections for equipment/utilities
- ❑ check roof for loose or missing shingles
- ❑ termite and pest inspection/treatment
- ❑ exterior materials spot repair and touch up painting
- ❑ remove bird droppings or other stains from exterior
- ❑ check and update building file

Figure 23. Maintenance Chart. Many of the tasks on the maintenance chart can be done by volunteer help or service contracts. Regular visits to the site will help detect intrusion, storm damage, or poor water drainage.

The fire and police departments should be notified that the property will be vacant. A walk-through visit to familiarize these officials with the building's location, construction materials, and overall plan may be invaluable if they are called on in the future.

The optimum schedule for surveillance visits to the property will depend on the location of the property and the number of people who can assist with these activities. The more frequent the visits to check the property, the sooner that water leaks or break-ins will be noticed. Also, the more frequently the building is entered, the better the air exchange. By keeping the site clear and the building in good repair, the community will know that the building has not been abandoned (see fig. 24). The involvement of neighbors and community groups in caring for the property can ensure its protection from a variety of catastrophic circumstances.

The owner may utilize volunteers and service companies to undertake the work outlined in the maintenance chart.

Service companies on a maintenance contract can provide yard, maintenance, and inspection services, and their reports or itemized bills reflecting work undertaken should be added to update the building file.

Figure 24. Once mothballed, a property must still be monitored and maintained. The openings in this historic barn has been modified with a combination of wood louvers and metal mesh panels which require little maintenance. The grounds are regularly mowed, even inside the chain link security fence. Photo: Williamsport Preservation Training Center, NPS.

Components of a Mothballing Project

Document: Brearley House, New Jersey; 2½ story center hall plan house contains a high degree of integrity of circa 1761 materials and significant early 19th century additions. Deterioration was attributable to leaking roof, unstable masonry at gables and chimneys, deteriorating attic windows, poor site drainage, and partially detached gutters. Mothballing efforts are required for approximately 7-10 years.

Stabilize: Remove bat droppings from attic using great caution. Secure historic chimneys and gable ends with plywood panels. Do not take historic chimneys down. Reroof with asphalt shingles and reattach or add new gutters and downspouts. Add extenders to downspouts. Add bug screens to any ventilation areas. Add soil around foundation and slope to gain positive drain; do not excavate as this will disturb archeological evidence.

Mothball: Install security fence around the property. Secure doors and windows with plywood panels (½" exterior grade). Install preformed metal grills in basement and attic openings. Add surface mounted wiring for ionization smoke and fire detection with direct wire to police and fire departments. Shut off heat and drain pipes. Add window exhaust fan set on a thermostatic control. Provide for periodic monitoring and maintenance of the property.

Figure 25. Above is a summary of the tasks that were necessary in order to protect this significant property while restoration funds are raised. Photographs: Michael Mills; Ford Farewell Mills Gatsch Architects.

a. A view showing the exterior of the house in its mothballed condition.

b. Plywood panels stabilize the chimneys. Note the gable vents.

c. The exhaust fan has tamper-proof housing.

MOTHBALLING CHECKLIST

Mothballing Checklist In reviewing mothballing plans, the following checklist may help to ensure that work items are not inadvertently omitted.	Yes	No	Date of action or comment.
Moisture • Is the roof watertight? • Do the gutters retain their proper pitch and are they clean? • Are downspout joints intact? • Are drains unobstructed? • Are windows and doors and their frames in good condition? • Are masonry walls in good condition to seal out moisture? • Is wood siding in good condition? • Is site properly graded for water run-off? • Is vegetation cleared from around the building foundation to avoid trapping moisture?			
Pests • Have nests/pests been removed from the building's interior and eaves? • Are adequate screens in place to guard against pests? • Has the building been inspected and treated for termites, carpenter ants, and rodents? • If toxic droppings from bats and pigeons are present, has a special company been brought in for its disposal?			
Housekeeping • Have the following been removed from the interior: trash, hazardous materials such as inflammable liquids, poisons, and paints and canned goods that could freeze and burst? • Is the interior broom-clean? • Have furnishings been removed to a safe location? • If furnishings are remaining in the building, are they properly protected from dust, pests, ultraviolet light, and other potentially harmful problems? • Have significant architectural elements that have become detached from the building been labeled and stored in a safe place? • Is there a building file?			
Security • Have fire and police departments been notified that the building will be mothballed? • Are smoke and fire detectors in working order? • Are the exterior doors and windows securely fastened? • Are plans in place to monitor the building on a regular basis? • Are the keys to the building in a secure but accessible location? • Are the grounds being kept from becoming overgrown?			
Utilities • Have utility companies disconnected/shut off or fully inspected water, gas, and electric lines? • If the building will not remain heated, have water pipes been drained and glycol added? • If the electricity is to be left on, is the wiring in safe condition?			
Ventilation • Have steps been taken to ensure proper ventilation of the building? • Have interior doors been left open for ventilation purposes? • Has the secured building been checked within the last 3 months for interior dampness or excessive humidity?			

Figure 26.. MOTHBALL CHECKLIST. This checklist will give the building owner or manager a handy reference guide to items that should be addressed when mothballing a historic building. Prepared by H. Ward Jandl, NPS.

Conclusion

Providing temporary protection and stabilization for vacant historic buildings can arrest deterioration and buy the owner valuable time to raise money for preservation or to find a compatible use for the property. A well planned mothballing project involves documenting the history and condition of the building, stabilizing the structure to slow down its deterioration, and finally mothballing the structure to secure it (See fig. 25). The three highest priorities for the building while it is mothballed are 1) to protect the building from sudden loss, 2) to weatherize and maintain the property to stop moisture penetration, and 3) to control the humidity levels inside once the building has been secured. See Mothballing Checklist Figure 26.

While issues regarding mothballing may seem simple, the variables and intricacies of possible solutions make the decision-making process very important. Each building must be individually evaluated prior to mothballing. In addition, a variety of professional services as well as volunteer assistance are needed for careful planning and repair, sensitively designed protection measures, follow-up security surveillance, and cyclical maintenance (see fig. 27).

In planning for the future of the building, complete and systematic records must be kept and generous funds allocated for mothballing. This will ensure that the historic property will be in stable condition for its eventual preservation, rehabilitation, or restoration.

Figure 27. This residential building blends into its neighborhood even though all the windows have been covered over and the front steps are missing. The grounds are maintained and the special attention to decoratively painting the window panels shows that the property is being well cared for until it can be rehabilitated. Photo: Ohio Historical Society.

Acknowledgements

This publication has been prepared pursuant to the National Historic Preservation Act of 1966, as amended, which directs the Secretary of the Interior to develop and make available information concerning historic properties. Comments on the usefulness of this publication may be directed to H. Ward Jandl, Deputy Chief, Preservation Assistance Division, National Park Service, P.O. Box 37127, Washington, D.C. 20013-7127. This publication is not copyrighted and can be reproduced without penalty. Normal procedures for credit to the author and the National Park Service are appreciated.

The author, Sharon C. Park, Senior Historical Architect, Preservation Assistance Division, National Park Service, would like to acknowledge the assistance of the following individuals in the preparation and review of this publication. H. Ward Jandl served as the technical editor and assisted with producing this Preservation Brief. In addition the following persons have provided invaluable information and illustrations: Ernest A. Conrad, PE; Doug Hicks, NPS Williamsport Preservation Training Center; Thomas C. Taylor, Colonial Williamsburg; Karen Gordon, Seattle Urban Conservation Office; Kevin B. Stoops, Seattle Department of Parks and Recreation; Michael Mills, AIA; Christine Henry, architect, Mary Beth Hirsch, Ohio Historical Society. Thanks also to Preservation Assistance Division staff members Michael J. Auer, Anne E. Grimmer, Kay D. Weeks, Timothy A. Buehner, and Jean Travers, and to the numerous staff members of the NPS Regional offices who submitted comments.

All photographs and drawings are by the author unless otherwise noted.

Cover photograph: Mothballing of this historic house involved a new membrane roof covering over the historic roof and slatted window covers for security and ventilation. Photo: Williamsport Preservation Training Center, NPS.

ISSN: 0885-7016
September 1993

Further Reading

Cotton, J. Randall. "Mothballing Buildings." *The Old House Journal*. July/August, 1993.

Fisher, Charles E. and Thomas A. Vitanza. "Temporary Window Vents in Unoccupied Historic Buildings." Preservation Tech Note (Windows, No. 10). Washington, DC: National Park Service, 1985.

Frazier Associates. "Mothballing Historic Buildings." Preserving Prince William, 2. County of Prince William, VA, 1990.

Michell, Eleanor. *Emergency Repairs for Historic Buildings*. London: Butterworth Architecture, 1988.

"Mothballing Vacant Buildings," *An Anti-Arson Kit for Preservation and Neighborhood Action*. Washington, DC: Federal Emergency Management Agency, 1982.

Nelson, Lee H. *Preservation Briefs 17. Architectural character-Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character*. Washington, DC: Government Printing Office, 1988.

Solon, Thomas E. "Security Panels for the Foster-Armstrong House." *Association for Preservation Technology Bulletin*. Vol XVI no. 3 & 4, 1984. (note the design of the panels, but be aware that additional louvering may be needed on other projects).

Relevant Historic Research Findings (prepared by the City of Round Rock)

Introduction

Located near the Round Rock, where Chisholm Trail crosses Round Rock Avenue, the Harris Stagecoach Inn is a remaining part of Round Rock's earliest founding. It was built before the settlement was named Round Rock, and even before Williamson County was established. John J. Harris built the Stagecoach Inn over five years, from 1848-1853, making it one of the three oldest surviving buildings in Round Rock (the others are the 1849 Harris-Ross house and the 1853 McNabb-Quick house). The property became a Registered Texas Historical Landmark (RTHL) in 1963, less than a year after the landmark program was established.

Round Rock grew to serve travelers along one of the state's most important north-south roads, with regular stagecoach services from Brownsville to Salado and from San Antonio, Texas, to Helena, Arkansas. The Inn served mainly as a horse-changing station and rest stop, since it was close enough to Austin that overnight lodging was usually only necessary during bad weather or when the creek was too high. Mrs. Susannah Elizabeth Tisdale Harris was proud that every room had its own feather bed, courtesy of the flock of geese they kept. A neighbor recollected that the geese would honk loudly when the stagecoach was about a mile away, alerting the townspeople to meet the stage and see if they had received any mail.

The Inn was in operation for 30 years, until the International & Great Northern Railroad extended a line into Williamson County, drawing travelers and merchants to the depot and the new town around it. The Inn became a tavern, then a residence for about a century, and then a residence from the mid-1990s to 2012.

Historic Significance/Context

The Stagecoach Inn is a remaining part of Round Rock's founding period, soon after Texas became part of the United States in 1845. Statehood opened a flood of newcomers intending to settle. Jacob Harrell, Austin's first blacksmith and second mayor, had a headright where the major north-south road between Austin and Dallas crossed Brushy Creek. There is good, if not conclusive, evidence that this was the Military Road laid out by Col. William Cooke in 1840-41 along the western frontier of the Republic of Texas.

In 1848 Harrell moved his blacksmith shop to his headright and began selling parts of it. He did not design a townsite with regular blocks and streets, but simply sold off acreage along the road and creek as needed. The creek crossing was a natural location for businesses that served travelers, such as inns, liveries, and blacksmiths. It also became a commercial center for the local population, where they could receive mail and trade cotton, grain and hides for other merchandise.

John J. Harris was one of Harrell's first buyers, who began building the Inn in 1848 and completed it in 1853, about the time that the City of Round Rock got its name. Two stagecoach lines soon began regular service through Round Rock, the Brownsville-Salado Line and a line that went from San Antonio to Arkansas. The stagecoach lines established stops every 18 miles or so where the coach could change horse teams and travelers could rest and eat.

Harris' Stagecoach Inn was atop a small hill on the south side of Brushy Creek, facing the stagecoach road. John and Susannah Harris were gracious hosts who served hot meals, such as chicken and dumplings, rather than the more common hard tack fare. They kept a flock of geese to supply feathers for beds and pillows. The geese would honk loudly when a stagecoach was near, and townspeople would come to meet the stage and see if they had mail. Because the stop was close to Austin, overnight accommodations were usually only necessary in bad weather or when the creek was high – in which case guests might stay several days.

Importance of the Military Road/Chisholm Trail

The importance of the road to the settlement of Round Rock cannot be understated. Without its use as a long-distance route it would not have emerged as a commercial center. Early buildings either faced south for thermal comfort, or faced the road for commercial reasons (the Stagecoach Inn faced the road to the east). This context changed as transportation systems evolved. When New Round Rock was built around the railroad depot just to the east, Round Rock Avenue was built as a direct route from the depot to Old Round Rock, meeting what would be Chisholm Trial Road just north of the Stagecoach Inn. Although the railroad drew commercial activity away from Old Round Rock, Chisholm trial Road was still the primary north-south road between Austin and Georgetown. Gradually the part of Chisholm Trail south of Brushy Creek became less used as more travelers turned east on Round Rock Avenue and used Mays to cross Lake Creek by the depot. The northern part of Chisholm Trail road and the bridge by the Round Rock were not completely bypassed until Mays Street was extended north over Brushy Creek as part of State Highway 81 in the mid-1930s. By this time the Stagecoach Inn had long lost its commercial frontage and had been a residence for half a century.

Early Round Rock Architecture

The buildings of Old Round Rock, including the Stagecoach Inn, may be described as “pre-railroad” – a period after the pioneer era when settlers built their own rough cabins, but before the railroads made a wide variety of building materials easily available. Pre-railroad building forms were dictated by tradition and climate rather than fashion; modest homes generally didn’t have a particular architectural “style” until pattern books and standardized lumber were widely available.

Pre-railroad buildings were constructed by skilled masons and carpenters (often itinerant) from materials sourced nearby. Limestone was abundant in the Round Rock area, as were large (if not particularly tall or straight) trees, and there was a sawmill on the south side of the creek. Manufactured materials were available but expensive to transport, so their use tended was often limited to lightweight and/or decorative items such as nails, window glass, hardware, and paint. Carpenters routinely built windows and doors themselves. Plank and log buildings were also common in early Round Rock, but only the stone buildings have survived.

The stone in the Stagecoach Inn was quarried directly from the hill on which it stands. Most of the stone for the earliest buildings was quarried from the hill and from the creek bed – the wagon ruts there are related to quarrying and rather than general transport.

The Stagecoach Inn is also notable in that its original 36 by 36 foot structure is significantly larger than the other surviving buildings in Old Round Rock, with tall gable end walls, two large chimneys, and ten double-hung windows. The next building of similar size, the Owens House (St. Charles Hotel) was not built until the late 1860s. Harris made a significant investment in the future of the community to commission a building that would take five years to build.

Building Alterations/Previous Restoration Efforts

Although there have been a number of additions to the Inn over the years, its owners have made a consistent effort to avoid major exterior changes. The original part of the Inn is side-gabled with a large chimney at each gable end, and a slight witch’s hat flare to the roof in the front and back. The stone was quarried from the hill on which it stands, and beams were of hand-hewn oak. The earliest photos of the building show a shake roof and 6-over-6 double-hung windows.

According to the family of former owners, the Inn originally had a dogtrot plan, and the center breezeway was closed in by the Harris family sometime before B.C. Richards purchased it 1907. The floors of the resulting entrance hall were of cedar that had been hauled from Brenham by ox-cart. The floors were apparently in good condition when they were covered with oak flooring in the early 1950s.

The B.C. Richards family made few alterations to the property other than building extensive landscape walls of dry-stacked limestone (Richards operated a small quarry downhill from the house). Richards sold the house to author Donald Joseph, who apparently modernized the interior but did not change the exterior. Joseph sold the property back to the Richards family in the 1930s. At some time during either Joseph's or the second Richards family's ownership, a shed addition was built across the back of the Inn to add rooms with indoor plumbing, and the window openings in the front rooms were widened for new multi-paned casement windows.

Descendants of the B. C. Richards family (who owned the Inn from 1907 to around 1930) recall that when RM 620 was established it was originally routed on the south side of the Inn. The Richards family had objected, because the road would separate them from a neighboring relative that the children frequently visited. If RM 620 had been routed to the south as planned, the Inn might not now be in jeopardy.

The next owners were Don and Laura Davol, who were associated with the "Army Colony," a group of retired officers who were attracted by Round Rock's old west heritage, and purchased and restored several of its early buildings, which would otherwise probably been lost. The Austin Heritage Society sponsored a "Round Rock Pilgrimage" home tour featuring these buildings, headlined by the Stagecoach Inn. The Inn and several others of these homes were some of the first properties to be designated as Registered Texas Historic Landmarks when the program was created in 1963.

Sometime between 1965 and 1971 the Davol family made an addition to the south end of the house, aligned to the rear wall of the original structure. The approximately 22 by 28 foot addition was a simple side gable, with exposed rafters inside. They made an effort not to disturb the original structure, accessing the room through an existing doorway (they may have changed its shape to an arch) and using similar stone and windows on the addition. The roof of the earlier addition along the back was also extended to make a carport behind the new addition.

The City adopted its historic preservation ordinance in 1979, and the Inn was designated as a local historic landmark in 1980.

Between 1984 and 1988, Laura Davol redeveloped the 3.29 acre property as "The Commons," a retail and office complex designed to complement the Inn. This made the property commercially viable, but the Inn's context was somewhat compromised, as it became one in a complex of similar buildings rather than a single, prominent building on a rise. The part of Chisholm Trail Road south of RM 620 had long fallen into disuse, so rather than fronting on the main north-south road, the Inn had a side frontage on RM 620.

In 1989 the City became a Certified Local Government (CLG) and agreed to adopt local preservation ordinances based on the Secretary of the Interior's Standards for the Treatment of Historic Properties. The city would not adopt these design guidelines until 2000.

In 1992 the city hired a consultant to survey and inventory its historic resources and determine what properties would merit historic designation. The historical significance of the Stagecoach Inn was described as: "this building is one of the

most well-preserved stagecoach stops remaining in the state, and is a reminder of Round Rock's past importance as a stop on the Chisholm Trail and other stage roads."

In 1994 the Inn needed repair, and the new owner asked the HPC for permission to install a metal roof, and to replace the windows with fixed, single-lite windows, which the HPC approved. The historic medallion and plaque had been lost for several years and neither the owner nor the HPC realized that the building also needed state review. In May 1995 the project architect noticed the state designation, and sent drawings to the Texas Historical Commission (THC) architect, explaining why a metal roof was necessary and offering to install new windows if the THC could provide a picture of the original ones.

The THC architect replied that if the owner had been interested in restoration, the THC would have recommended that the new roof be wooden or wood-colored composition shingle, restricting the metal roofing to the addition if it was necessary. Instead of the single-light windows, either the 1930s casement windows should have been restored, replaced with matching units, or the original 6-over-6 wooden sash windows could have been installed (although since the double-hung windows were smaller it would have required reconstructing the stone openings).

In March 1996 the State Marker Review Board met and voted to de-designate the Stagecoach Inn because it "…has undergone a number of exterior alterations which render it ineligible for RTHL designation. The THC's …staff worked with the building owner to try to offer alternative renovation plans, but eventually it was decided that changes required by the owner would not allow the retention of the designation. The historical marker had been missing from the property for a number of years."

In October 2000 the City adopted the Design Standards for Historic Commercial and Residential Properties, based on the Secretary of the Interior's Standards. These guidelines would have offered the HPC better guidance when it approved the 1994 alterations.

Relevant Historic Plans

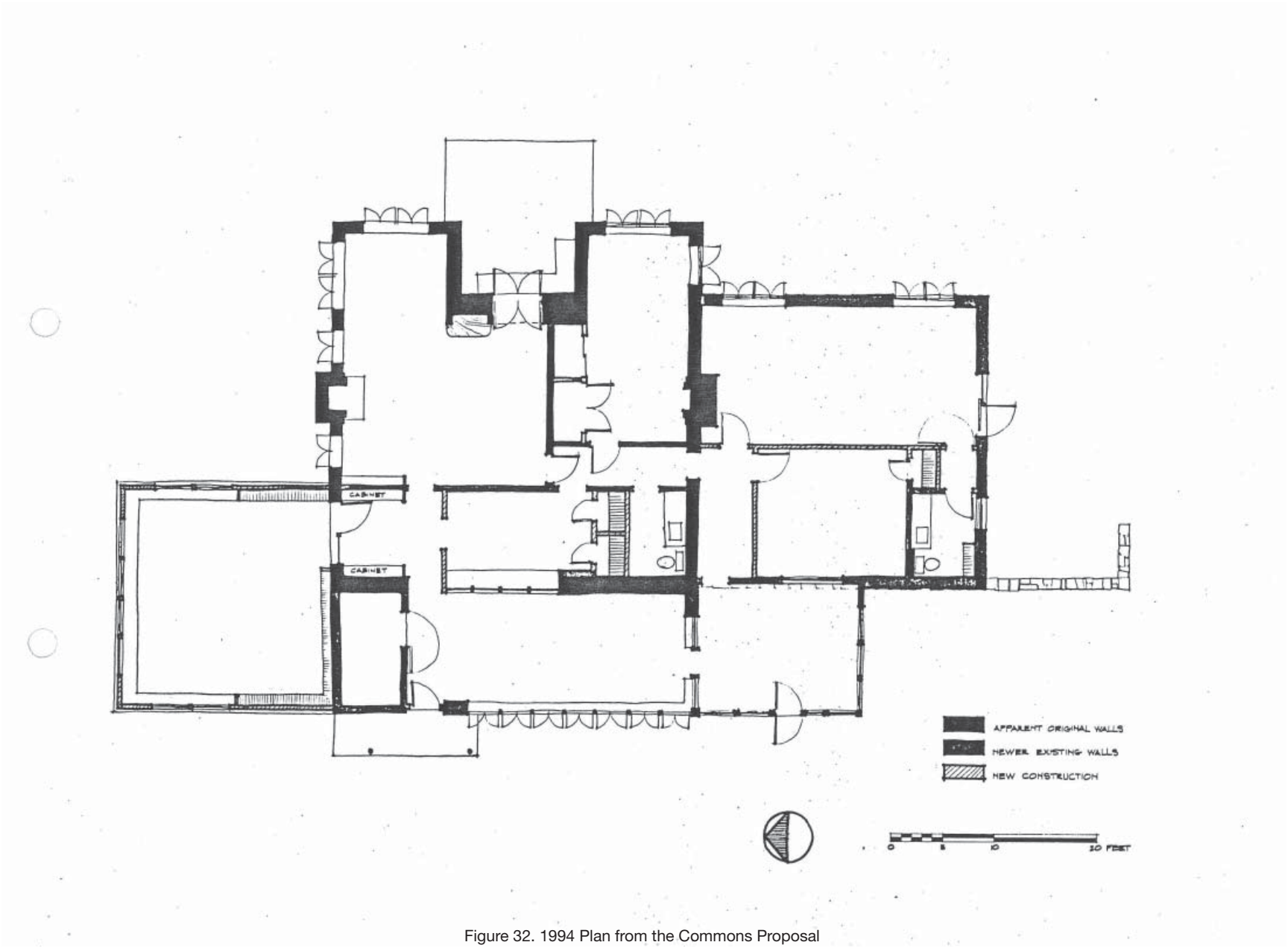


Figure 32. 1994 Plan from the Commons Proposal
(Source: City of Round Rock)

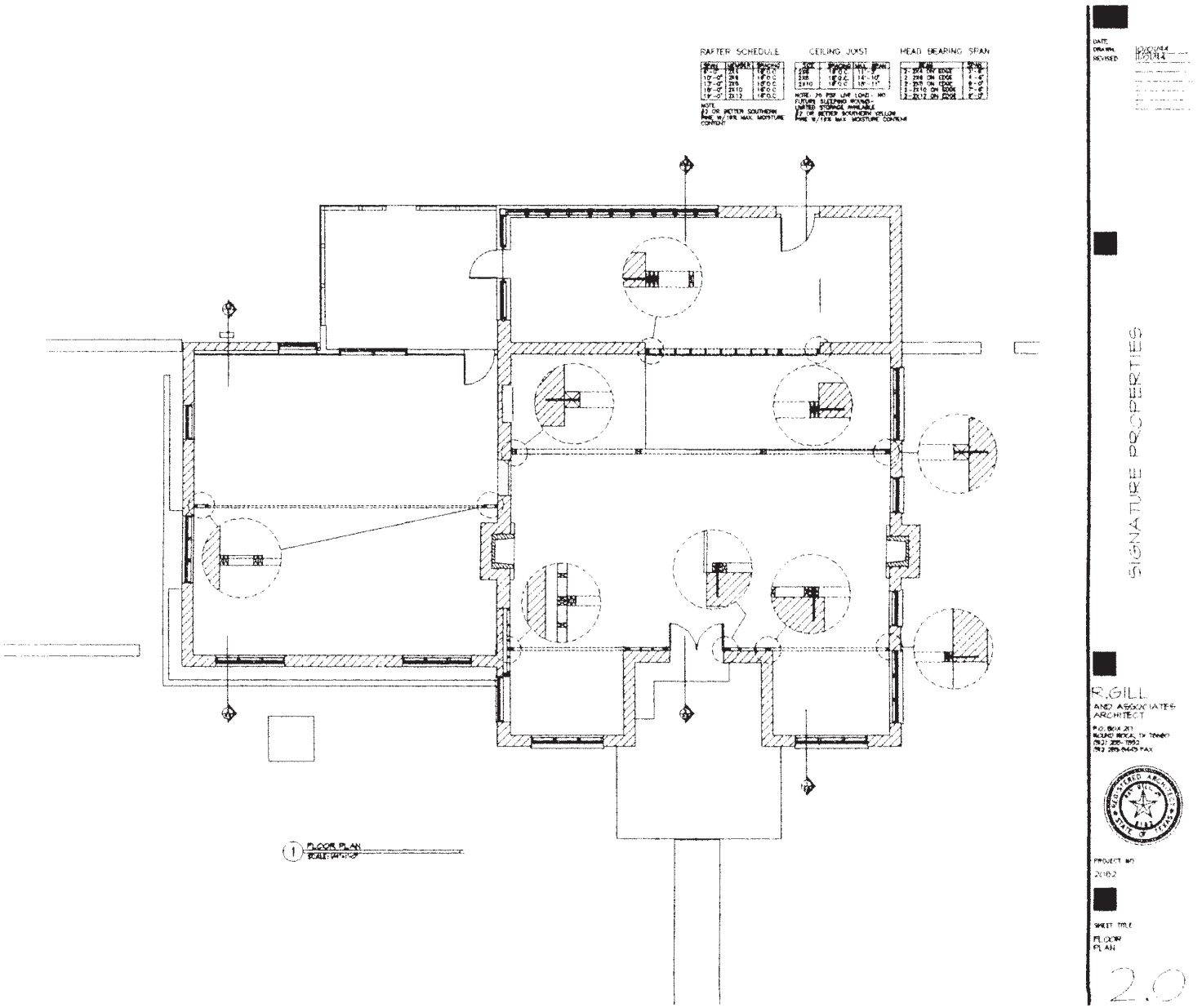


Figure 33. 1994 Gill Renovation Plan
(Source: City of Round Rock)

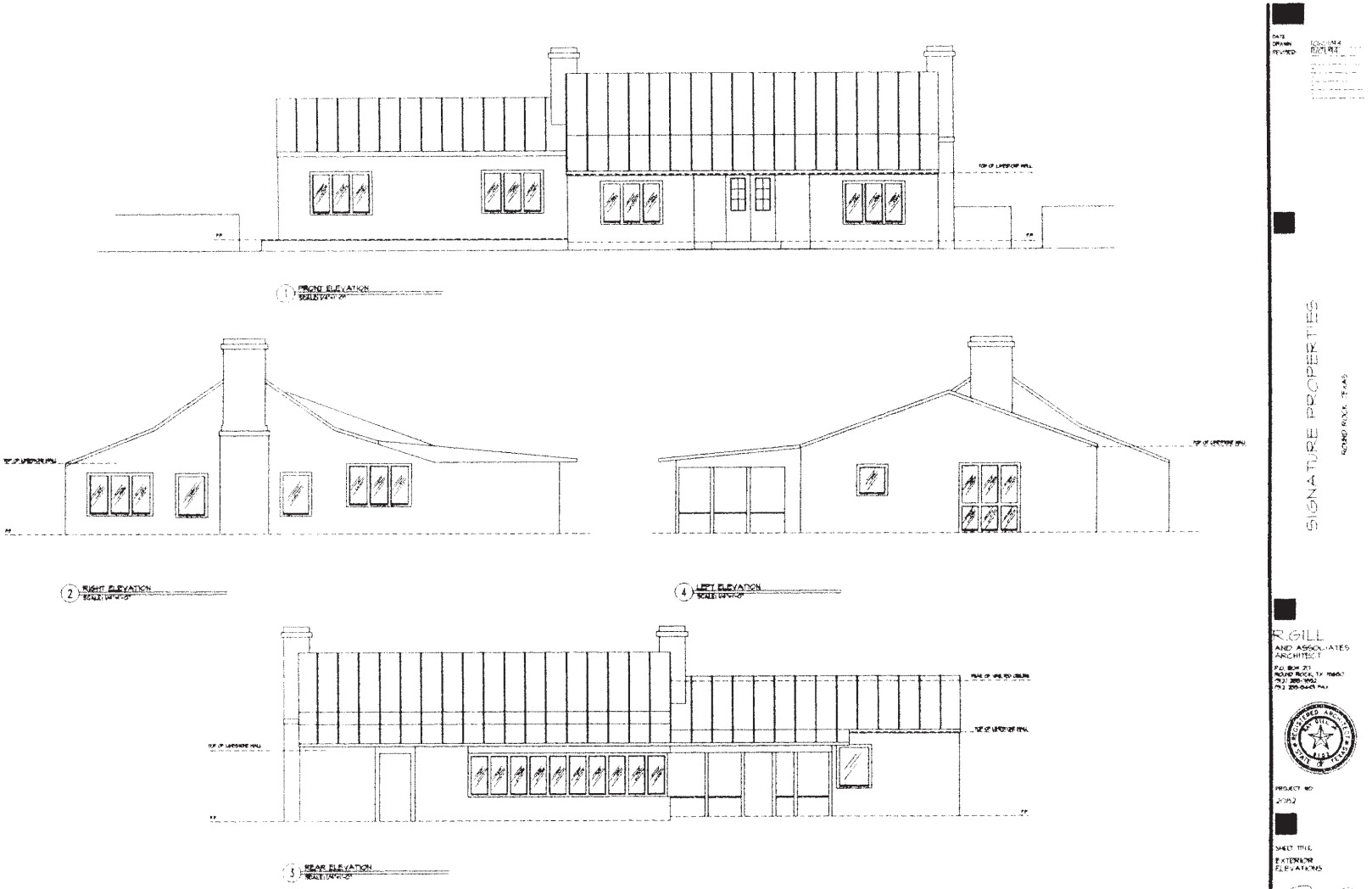


Figure 34. 1994 Gill Renovation Elevations
(Source: City of Round Rock)

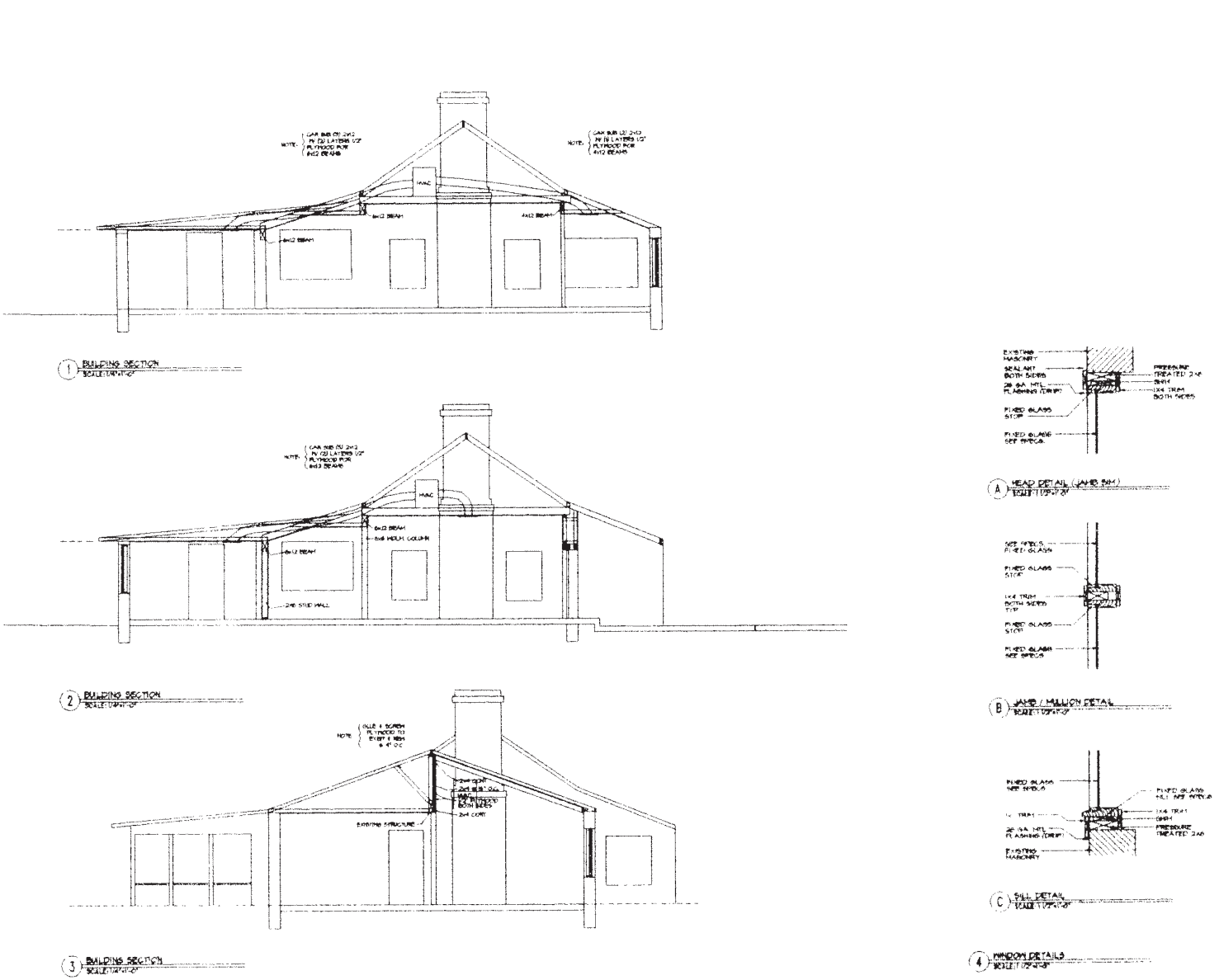


Figure 35. 1994 Gill Renovation Sections
(Source: City of Round Rock)

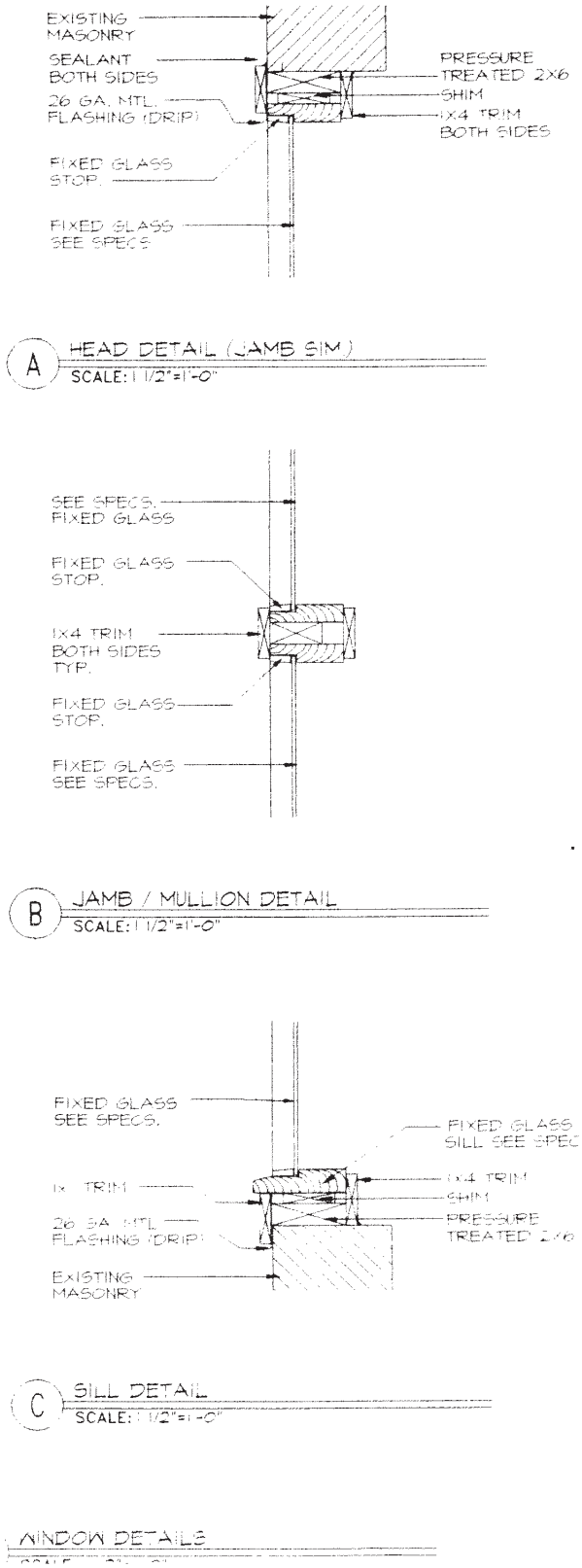


Figure 36. 1994 Gill Renovation Details
(Source: City of Round Rock)

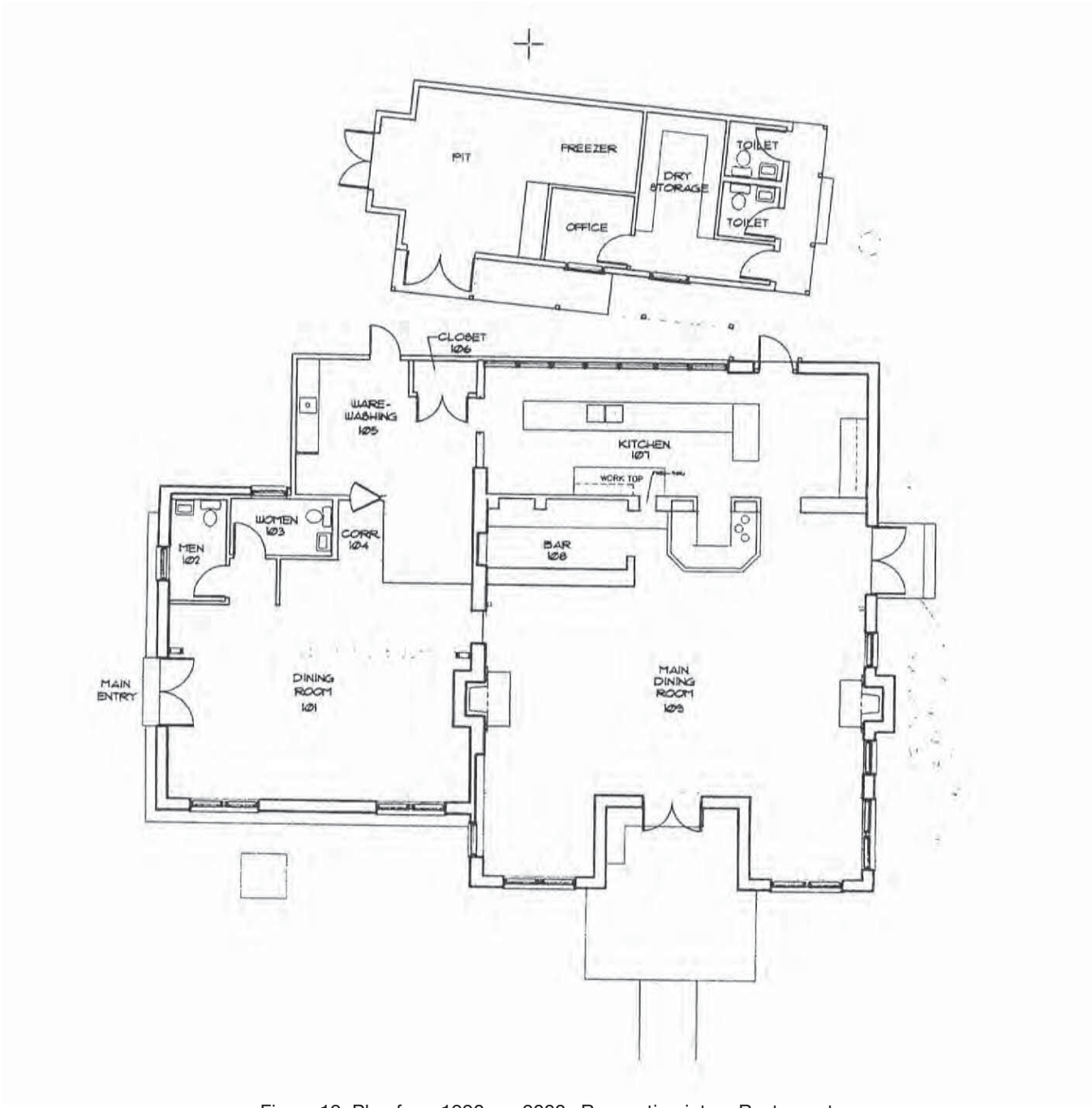


Figure 19. Plan from 1990s or 2000s Renovation into a Restaurant

Figure 37. Plan from 1990s or 200s Renovation into Restaurant
(Source: City of Round Rock)

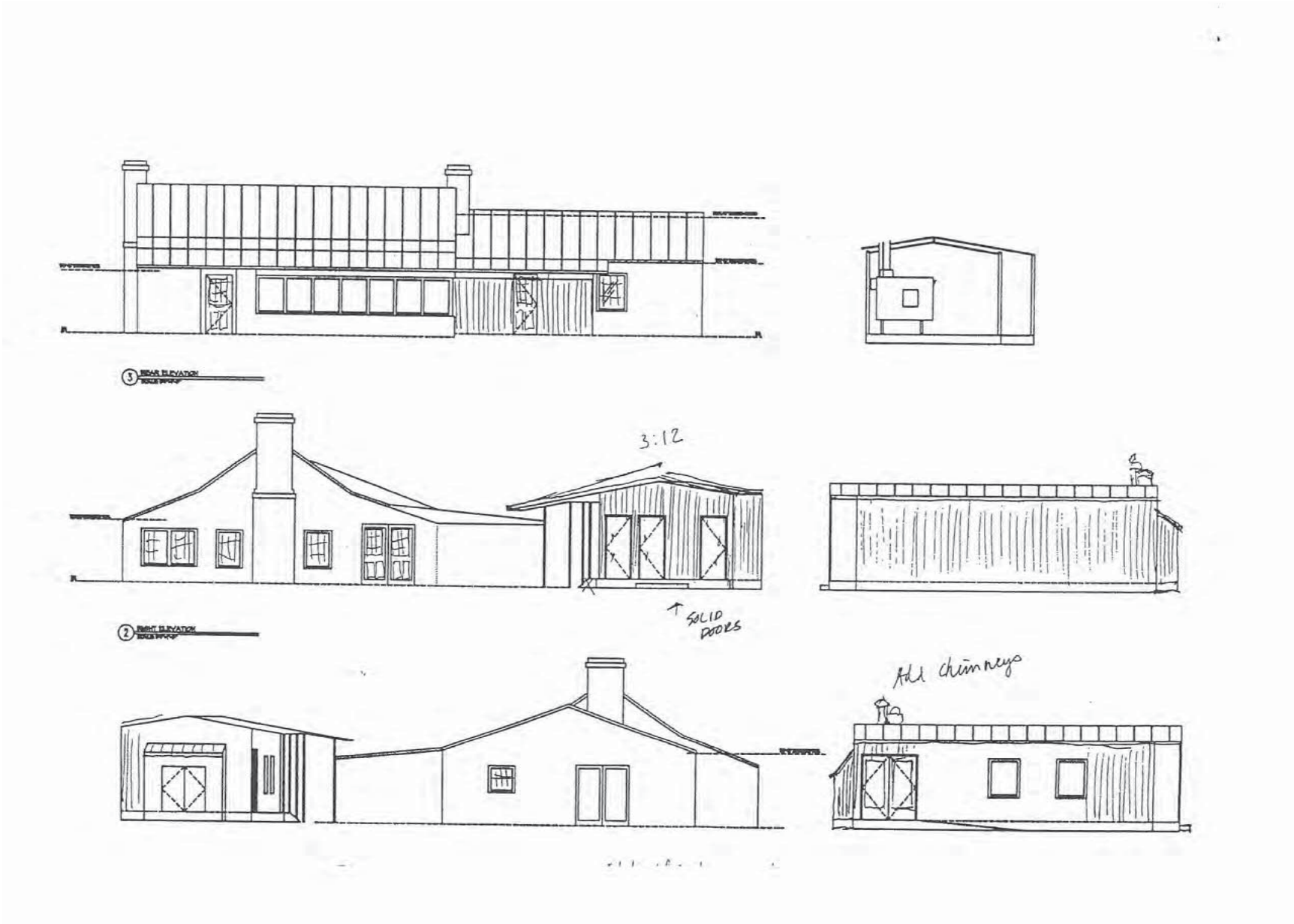


Figure 38. Elevations from 1990s or 200s Renovation into Restaurant
(Source: City of Round Rock)

Sources

Charles, John Obed. *Moving Historic Buildings*. Washington: US Government Office, 1979.

Department of the Interior. *The Preservation of Historic Architecture: The US Government's Official Guidelines for Preserving Historic Homes*. Guilford, Connecticut: the Lyon's Press, 2004.

Erlichman, Howard J. *Camino del Norte: How a Series of Watering Holes, Fords, and Dirt Trails Evolved into Interstate 35 in Texas.* College Station, TX: Texas A&M University Press, 2006.

Halley, Mabel Christie. The Round Rock Stage Coach Inn. [Publication unclear but appears to have been scanned from a magazine or newsletter of the period], 1956.

Handbook of Texas Online, Seymour V. Connor, "Harrell, Jacob M.," Uploaded on June 15, 2010. Published by the Texas State Historical Association. Accessed August 23, 2016, http://www.tshaonline.org/handbook/online/articles/fha77.

Jackier, Diane Alyssa (2001). *Moving Historic Structures: The Washington Street Urban Renewal Project*. (Masters Thesis). University of Pennsylvania, Philadelphia, PA.

Makemson, W.K. *Historical Sketch of First Settlement and Organization of Williamson County and Constitution of Old Settlers Association*, 1904.

McAlester, Virginia Savage. *A Field Guide to American Houses: the Definitive Guide to Identifying and Understanding America's Domestic Architecture, Second Edition.* New York: Alfred A. Knopf, 2014

Paravalos, Peters. *Moving a House with Preservation in Mind*. Lanham: Altamira Press, 2006.

Park, Sharon C. "Preservation Brief 31: Mothballing Historic Buildings." National Park Service website. Accessed August 1, 2016. https://www.nps.gov/tps/how-to-preserve/briefs.htm.

Scarbrough, Clara Stearns. *Land of Good Water, Takachue Pouetsu: A Williamson County, Texas, History.* Georgetown, TX: Williamson County Sun Publishers, 1973, revised 1990.

Scarbrough, Linda. *Road, River, and Ol' Boy Politics: A Texas County's Path from Farm to Supersuburb.* Austin: Texas State Historical Association, 2005.

Smith, C. Lynn. "Historic Structure Report: the Sansom House" and Thompson & DiGesualdo, 1985: "Historical Round Rock Texas" pages 184, 188, 234-239, 2000.

Thompson, Karen R. and Jane H. DiGesualdo. *Historical Round Rock Texas.* Austin, TX: Eakin Press, 1985.

Glossary of Historical Building Terms

Glossary of Terms

Abat-son: large louvers in a belfry designed to direct the sound of church bells towards the ground.

Absorption: the amount of water a brick will soak up. The percentage of absorption for a piece of brick is measured by subtracting its dry weight from its wet weight, dividing the difference by the dry weight.

Altar: the table in a Christian church which is used as the focus of a religious ritual.

Anchor: a metal clamp fastened to the outside of a wall, or between two materials, and used to tie elements together.

Apron: a piece of interior trim found below the stool of a window. Also used to describe paneling found on the exterior of a building.

Astragal: a bead, which is usually half round, with a fillet on one or both sides. Term is often used to describe the classical molding consisting of a small convex molding decorated with a string of beads or bead-and-reel shapes. Also, a member, or combination of members, fixed to one of a pair of doors or casement windows to cover the joint between the meeting stiles and to close the clearance gap.

Awning Window: type of window in which the sash projects outward, hinged on top.

Baluster: one of a number of short vertical members, often circular in section, used to support a stair handrail or coping.

Balustrade: a series of short pillars or other uprights connected on top by coping or a handrail and usually on the bottom by a bottom rail; found on staircases, balconies, and porches.

Base: the lowest portion of a column or other architectural structure.

Basement Window: window with wood or metal in-swinging sash hinged at either the top or bottom.

Beaded Board: a tongue-and-groove wood finish material consisting of usually 4" or 6" boards with a milled bead along the centerline and along the edge adjoining the tongue. Commonly used for porch ceilings and for wainscots in mid 19th to early 20th century housing.

Bearing Wall: a wall that supports more than its own weight, such as a roof or floor.

Belfry: a roof at the top of the tower, which holds the bell itself.

Belt Course: a horizontal board across or around a building; usually a flat wood member with a molding beneath.

Blistering: a condition, usually found on sandstone and sometimes on granite, which involves swelling accompanied by the rupturing of a thin uniform skin both across and parallel to the bedding plane; often leads to greater surface peeling (exfoliation, delamination or spalling).

Bond: the systematic lapping pattern of brick masonry construction; or the adhesion between items, such as that between plaster and masonry.

Botonee: a cross with arms terminating in the form of a trefoil.

Box Gutter (also K-type or Ogee Gutter): at the eaves of a building, a metal trough with a nearly square or rectangular cross-section to catch rainwater and carry it off. May be suspended from the cornice, incorporated into the cornice, or inlaid in the roof surface near the bottom edge.

Box-head Window: a window made so that the sash can slide vertically into the wall space above the head.

Bracket: any overhanging member projecting from a wall or column serving to support any overlying member.

Cantilever: a projecting bracket used for carrying the cornice or the extended eaves of a building. Also, a structural member which projects beyond its supporting wall or column.

Capital: the upper decorated portion of a pilaster or column which is supporting an entablature.

Casing: finished visible framework around a window or door.

Cast Iron: Iron with too high a carbon content to be classified as steel.

Cast Stone: precast concrete components made with a high degree of quality and precision; also called “artificial stone.”

Caulking: the weather-resistant sealing of a joint by filling the void or crack with a permanently elastic material.

Chamfer: a bevel or cant, such as a small splay at the external angle of a masonry wall. Also, an oblique surface produced by beveling an edge or corner.

Cladding: a material used as the exterior wall enclosure of a building.

Column: a circular upright member; usually slightly tapering. Designed to carry an entablature or other load, but is also used ornamentally in isolation.

Conservation: the careful preservation and protection of a natural or cultural resource through planned management to prevent exploitation, destruction or neglect.

Consolidation: a process carried out in an effort to strengthen masonry, particularly natural stone and concrete. The process generally involves the application of an inorganic substance or the injection of some type of a chemically-curable monomer or clear silicone polymer. Silicon surface coatings, wax or other water-repellent coatings are also often tried as consolidants.

Coping: a covering on top of a wall, usually of metal or masonry.

Corbel: a stepped configuration as in masonry, formed by the projection of successive horizontal courses.

Cornerstone: a stone which is located near the base of a corner in a building and displays information recording the dedicatory ceremonies, and in some instances containing or capping a vault in which contemporary memorabilia are preserved; a foundation stone.

Cornice: a decorative element projecting from a wall, forming a horizontal division which crowns an architectural composition.

Corrosion: the surface deterioration of metal created by the chemical reaction of the metal with moisture, oxygen, or a chemical substance.

Coupled Window (also double window): two windows separated by a mullion.

Course: a horizontal band of masonry.

Crenellation: a parapet with alternating solid parts and openings, especially used in medieval European architecture along the top of a fortified wall through which arrows or other weapons can be shot.

Cresting: the ornamental work forming the top of a wall or screen, or the decorative railing which runs along the ridge of a roof; oftentimes perforated as well as decorated.

Cricket: a small false roof or a canted part of a roof to throw off water from behind an obstacle such as a chimney.

Crown Molding a continuous decorative band located on the extreme top edge of an exterior wall or in the area of transition between wall and ceiling.

Cupola: a dome-shaped roof on a circular base, often set on the ridge of a roof.

Dentils: small square blocks located on cornices, moldings and other features; usually found in series.

Door Frame: structure, surrounding door opening, to which the door is hinged.

Door Sill: the lower horizontal member of a door frame.

Double Glazed Window: a window with two layers of glass, often with an air space between the panes, primarily for insulating purposes.

Double-hung Window: windows in which both the upper and lower sash operate vertically.

Downspout: a pipe carrying water from the gutters to the ground or the sewer connection.

Drip Cap: projecting horizontal molding located above doors, windows, and archways which causes water to drip beyond the outside of the frame.

Dutchman Repair: process which involves replacing a small area of damaged stone or wood with a new unit consisting of the same or a matching material. The replacement can be wedged in place or secured with an adhesive.

Eave: the portion of roof projecting beyond the walls.

Engaged Column: a column that is in direct contact with a wall, but has at least half of its diameter projecting beyond the surface of that wall.

Epoxy patch: an epoxy based compound applied in paste or putty form to repair, extend, or fill structural and decorative wood. Liquid forms may also be applied to strengthen or harden deteriorated wood."

Facade: an exterior face or elevation of a building.

Fanlight Window: a semicircular window over a door or window with bars that spread out from the center.

Fascia: any flat horizontal member or molding with little projection, as the bands into which the architraves of Ionic and Corinthian entablatures are divided. Also any narrow vertical surface which is projected or cantilevered or supported on any element other than a wall below.

Fenestration: the arrangement of windows and other openings on the exterior of a building.

Finial: a formal ornament which caps a canopy, gable, pinnacle, or other architectural feature.

Fixed Window: a window in which the sash does not open or operate.

Flashing: sheet-metal weather protection placed over a joint between different building materials, or between parts of a building, in such a manner that water is prevented from entering the joint.

Flat Arch: an arch with a flat intrados.

Flat Seam Metal Roof: a roof composed of sheet metal roofing with seams that are formed flat against the surface of the roof.

Footing: the part of a foundation that is widened in order to spread the load from the building across a broader area of soil.

Gable: the triangular segment of an exterior wall on a building that has a ridged roof.

Glazed Door: a door with glass comprising all or almost all of its surface.

Glazed Panel Door: a door made up of vertical and horizontal wood members or rails with sunken panels and a window.

Glazed Sheathed/Flush Door: a flat door, usually comprised of a thin-ply surface over internal structural members, with a window; can have solid or hollow core type.

Glazing: glass and its installation.

Hip: the angle formed at the junction of two sloping roof surfaces.

Hip Roof (hipped roof): a roof consisting of four pitched surfaces.

Historic Architect: an architect meeting the Secretary of Interior's minimum professional qualifications in historic architecture including a professional degree in architecture or a state license to practice architecture and at least one year of study in architectural preservation, American architectural history, preservation planning, or closely related field; or at least one year of full-time professional experience on historic preservation projects.

Integrity: the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric period.

Italianate: an architectural style characterized by multiple stories; low-pitched roof

with widely overhanging eaves with decorative brackets beneath; tall, narrow windows, often curved or arched above; windows frequently with elaborate crowns, usually of inverted U shape. Buildings of this style are often topped with a square cupola or tower.

Joist: one of a series of parallel timber beams which are used to support floor and ceiling loads and which are also supported by larger beams, girders, or bearing walls; the widest dimension is vertically oriented. ”

Keystone: stone with a wedge shape located at the center of an arch.

Lancet: a tall, narrow window with a pointed arch at the top. Resembles a lance and popular in Gothic architecture.

Limestone: a sedimentary rock consisting of calcium carbonate, magnesium carbonate, or both.

Lintel: a horizontal structural member, usually made of wood, stone, or steel, that supports a load over an opening. This can be exposed or obscured by wall covering.

Louver: small lantern or other opening used for ventilating attics or other spaces; often has wood slats.

Masonry: historically, stone or fired-clay units usually bonded with mortar; in modern terms, items such as concrete blocks are also called masonry.

Molding: a continuous decorative band used on the interior or exterior of a building as an ornamental device or to obscure the joint formed when two surfaces meet.

Mullion: vertical member dividing a window or other opening into two or more lights.

Muntin: a secondary framing member which secures panes within a window, glazed door, or window wall. Also, an intermediate vertical member dividing the panels of a door.

National Register of Historic Places: the official list of the Nation’s cultural resources which have been determined to be worthy of preservation. Properties listed include districts, sites, buildings, structures and objects that are significant in American history, architecture, archeology, engineering, and culture.

Ogee Arch: a pointed arch composed of reversed curves, the lower concave and the upper convex.

Panel Door: a door made up of vertical and horizontal wood members or rails with sunken panels.

Panel Window: a form of picture window consisting of several sash or fixed glazes separated by crossbars, mullions, or both.

Parting Strip: a vertical strip of wood separating the sashes of a window.

Pier: an isolated column of masonry or concrete, generally having a low ratio of height to width.

Pillars: upright members used to support superstructures.

Plinth: a square or rectangular base for column, pilaster, or door framing; a solid monumental base to support a statue or memorial; or a recognizable base of an external wall. Also in reference to the base courses of a building collectively, if so treated as to give the appearance of a platform.

Pointing: forming and tooling of joints after the masonry units have been laid for the purpose of protecting against weather and improving appearance.

Portland Cement: a type of cement which forms a very hard, dense mortar with low porosity.

Preservation: the act or process of applying measures to sustain the existing form, integrity, and material of a building or structure, and the existing form and vegetative cover of a site. It may include initial stabilization work, where necessary, as well as ongoing maintenance of the historic building materials.

Primer: first coat of paint applied on a bare material.

Reconstruction: the act or process of reproducing by new construction the exact form and detail of a vanished building, structure, or object, or a part thereof, as it appeared at a specific period of time.

Recorded Texas Historic Landmark (RTHL): resources designated by the Texas Historical Commission under Texas Government Code, Chapter 442, as worthy of preservation for their architectural integrity and historical associations. The highest honor the state can bestow on historic structures in Texas.

Rehabilitation: the act or process of returning a property to a state of utility through repair or alteration which makes possible an efficient contemporary use while preserving those portions or features of the property which are significant to its historical, architectural, and cultural values.

Repointing: the filling and tooling of open joints between bricks.

Restoration: the act or process of accurately recovering the form and details of a property and its setting as it appeared at a particular period of time by means of the removal of later work or by the replacement of missing earlier work.

Retaining Wall: a freestanding or laterally braced wall that bears against an earth or other fill surface and resists lateral and other forces from the material in contact with the side of the wall.

Ridge: the horizontal line created by the junction of the upper edges of two sloping roof surfaces.

Ridgecap: a covering of metal, wood, shingle, or any similar material which is used to cover the ridge of a roof.

Rising Damp: ground water that travels upward through a masonry wall by natural capillary action. Often indicated on the wall by an actual “tide line”.

Round-head Window: a window with a rounded or arched top member.

Rubble Masonry: stone masonry built with rough stones of irregular shapes and sizes.

Sash: the framework into which the panes of a window are set.

Score: the formation of a notch or groove in a smooth surface to create a pattern or line as in ashlar masonry.

Soft-burnt Brick (soft brick): brick fired at low temperatures, producing units of low compressive strength and high absorption.

Spalls (spalling): sheets of masonry separated from the surface by the action of water inside the masonry. Water soaking into the masonry causes spalling when temperatures change, thus forcing the surface to expand and pop off in pieces.

Splash Block: a concrete or plastic precast block which diverts water at the bottom of a downspout.

Stabilization: the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

Standing Seam Metal Roof: a sheet metal roof with seams that project at right angles to the plane of the roof.

State Archeological Landmark (SAL): designation made by a vote of the Texas Historical Commission (THC) in order to protect an archeological site or historic structure under the Texas Antiquities Code. Designation places the resource in a statewide inventory of significant sites which allows long range protection planning for the cultural heritage of Texas. It also provides that a designated resource cannot be removed, altered, destroyed, salvaged, or excavated without a permit from the THC.

Stile: one of the vertical structural members of a frame, such as the outer edge of a door or a window sash.

Striking: the finishing of a joint with any of a variety of tools.

Tooling: forming a masonry joint to a particular shape.

Transom: a window unit above a door.

Trefoil: a decorative motif having three lobes, like a clover leaf.

Triglyphs: the three vertical bands which alternate with the metopes on a Doric frieze or its derivatives.

Trim: edging or framing of openings and other features on a facade or indoors. Often of a different color and material than that of the adjacent wall surface.

Veneer: a decorative layer of brick, wood, or other material which provides a cover for inferior structural material and gives an improved appearance at a low cost.

Waterproofing: the act or process of making something impervious to water.

Weather Stripping: piece of metal, wood or other material installed around a door or window opening to protect against air infiltration and moisture penetration.

Window: an opening in a wall, primarily to provide light or ventilation. See also Awning Window, Austral Window, Bay Window, Bow Window, Box-Head Window, Bull's Eye Window, Combination Window, Cameo Window, Casement Window, Chicago Window, Clerestory Window, Coupled Window, Continuous Window, Double Glazed Window, Double-hung Window, False Window, Fixed Window, French Window, Fanlight Window, Gable Sash Window, Hopper Window, Industrial Window, Jalousie Window, Lattice Window, Oriel Window, Palladian Window, Panel Window, Projected Window, Pivoted Window, Round-head Window, Ribbon Window, Single-hung Window, Sliding Window, Stacked Window Unit, Triple Window, Triple Glazed Window, Triple-hung Window, Transom.

Window Frame: frame set in wall to receive and hold a window and its hardware.

Window Sill: lower, usually projecting, lip of a window frame.