

# Raynes Barn



61 Newfields Rd, Exeter, NH 03833

## **Update of earlier Historic Structures Reports For the Town of Exeter, NH**

May 3, 2021

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## Executive Summary

This 2021 Condition Assessment Report Update was undertaken by Bedard Preservation & Restoration LLC at the request of the Town of Exeter Raynes Farm Stewardship Committee, a subcommittee of the Conservation Commission.

This report focused almost entirely on the existing conditions and how to make the appropriate repairs with the associated costs. For a complete baseline documentation, historical photographs and history, please review the 2018 Historic Structures Report Update, Monroe & Whittemore Preservation Co attached to this document. These reports are an update to and supersede the following reports which are available at the Town of Exeter, Planning Department:

2002 Historic Structures Report, Monroe & Whittemore Preservation Co  
2017 Barn Mini-Assessment Report, New Hampshire Preservation Alliance, Ian Blackman

The approximate 50 acre property was purchased in 2002 by Town vote and with help from a grant from the Land and Community Heritage Investment Program (LCHIP).

The Raynes Barn is located at 61 Newfields Road, Exeter, NH.

Built in 1865, this eight-bent, seven-bay barn is approximately forty feet wide and ninety-six feet long and is the largest barn still remaining in the town of Exeter.

The owner at that time, Chase Wiggins, built this barn as component of the Exeter Cattle Market. This barn and property served as a gathering location for cattle being sent from Vermont and Maine to the Brighton, MA stockyard, which provided supplies to the troops during the Civil War.

A granite underpass, still existing today, allowed the cattle to be led under the B & M railroad tracks to the Squamscott River where they were loaded on to barges headed to Brighton, MA.

Completed work on this barn since 2002 includes, clean-out of the barn, increased drainage, a new roof, clapboard and trim replacement as well as significant structural, sill and carrier replacement/repair.

The cost of the recommendations outlined in this report for the exterior and interior of the barn are as follows:

<b>Project Cost (includes exterior and interior work)</b>	<b>\$ 208,000</b> (breakdown pages 31-34)
<b>Contingency @ 10%</b>	<b>20,800</b>
<b>Management Costs/General Conditions @ 10%</b>	<b><u>20,800</u></b>
<b>TOTAL PROJECT COST</b>	<b>\$ 249,600</b>

The Raynes Barn Stewardship Committee should be congratulated for their ongoing stewardship and are looking forward to the increased use of the barn as repairs are completed.

I will make myself available for any review site visit from LCHIP so that I can answer any questions or concerns.

Sincerely,  
Stephen Bedard

Existing Conditions



West Façade (road side)



South Side





East Side



North Side

## Exterior

### Site

With the installation of a catch basin and substantial grading improvements along the north side of the barn (2004) drainage away from the barn has been greatly improved. The soil near the catch basin shows signs of settling and should be back filled again and compacted. There are also several areas that need to be addressed to help keep water out of the basement area and away from the building.



Catch basin and drainage along the north side of the barn



Grading along the north side, to help eliminate the slope/water pressure coming down the hill towards the barn



Water/snow run-off that is not trapped by the catch basin is directed to a culvert a distance away from the east gable end of the barn. The culvert actually travels under the earthen ramp that heads towards the large barn doors on the east gable end.



Culvert under east gable end earthen ramp.

The south side has lower level entrances on either side of the raised ramp area that allowed the cows to enter and exit the building from the two doors from the tie-up section of the barn. The grade from these entrances should be increased away from the lower level openings.



South side with dual lower level entrances

The area of the ramp has brush and trees growing up along the foundation that should be removed.



Western side of south side ramp with brush



Eastern side of south ramp with brush growing along the foundation





Westerly entrance into the lower level area on the south side



Easterly entrance into the lower level area on the south side



While the west gable end does not receive water off of the roof such as the north and south side due, it is still important that any water that might accumulate in this area drain away from the structure/foundation. Snow piled up from drifting and/or from snow plowing the road needs to also be taken into consideration.

Currently, the the ground around the foundation actual pitches towards the building especially on the southerly side of the west gable end.



West façade looking southeast

### **Parking**

Parking around the general barn area appears to be adequate even with the increase of visitors to the site. There are areas to park gaining access from gates below and above the immediate road access to the west gable end. While this westerly access leading directly into the western gable end of the barn is only a few feet off of the main road, it is not recommended that this entrance be utilized as it is dangerously close to traffic.

Additional parking is also available at the adjacent conservation parking lot.

## ADA Access

There is no current, easy ADA access into the barn.

## Foundation

The majority of the foundation is in reasonable condition, given the age of the structure and the many years of water infiltration on the northerly side. The installation of the catch basin with its underground piping on the north side as well as basement catch basins and drains are helping to protect the foundation walls from the future freezing and thawing cycles.

The westerly part of approximately half of the north side of the stone barn foundation is in good condition while the easterly section is in need of re-pointing.



Foundation on north side



Westerly section of north foundation



Easterly section of north foundation

## **Roof**

The asphalt roof appears to be in good condition having been replaced in 2014

## **Clapboards and Trim**

The condition of the clapboards on each the four sides varies depending upon exposure and maintenance.

The clapboards on the west façade facing the road are in good condition as they have received more painting over the years due to the owner’s attention to the side(s) that “people see the most.”

The south side clapboards are in reasonable condition given the fact that the south side is the side that usually gets the most extreme temperature and moisture spikes given the exposure to the sun than all the others sides. Typically this exposure can lead into early clapboard failure.

It appears that a large number of clapboards on the north side have been replaced as evidenced by the different and faded colors of “barn red” used to paint the replacement clapboards.



The clapboards on the east gable end are in the poor condition with this side not being visible from the road as well as the addition of the connection to the later silo.



West façade with minor clapboard damage/loss



South side, westerly section with damaged clapboards, mainly above and below windows





South side, middle section showing damaged and missing clapboards



South side, easterly section showing damaged and missing clapboards with “toothed-in” clapboards in newer red paint





North side of barn showing a minimum of two areas of clapboard replacement as evidenced by the two newer barn red colors, "toothed-in" to the worn and lighter colored original clapboards



North side easterly section with clapboard repairs and damage



North side, middle section of clapboards showing replaced clapboards and plywood covering opening



North side, easterly section showing clapboard replacement



East side with damaged and missing clapboards





East side, northerly section with damaged, missing and replaced clapboards above connector with silo

There are various areas of trim around the whole barn that need repair and/or replacement. Most of the window trim especially on the south side does not have adequate flashing for the top window trim thereby causing damage that will require repair and in some instances replacement.



West Façade, trim on left side of barn door opening



West Façade, trim on right hand side passage door



East side with damaged window and door trim



East/north corner board with deteriorated corner boards

## Windows

The barn window sash is in poor condition due to the lack of paint, missing glazing, deteriorated frames and broken or missing panes. These window sash, with a few exceptions, appear to have been reused from an earlier barn or house. There are also sash that were actually 9 over 6 storm windows for an old 9 over 6 house sash. These storm windows were installed horizontally in the two filled-in walkout basement walls as well as the windows above which are 6 over 6 windows.



## Doors

The large barn doors on the west façade have been replaced and are in good condition but need to have a better securing system on the inside.

The two passage doors on the west façade appear to predate the existing barn and are probably from an earlier structure. The door of the left is probably a late 18<sup>th</sup> century door or early 19<sup>th</sup> century door. These doors are in need of repair and repainting.



West façade passage doors on both sides of the large barn doors



The large barn doors on the east side are in reasonable condition but are in need of repair and appropriate paint. The transom over the doors is also in need of serious attention.



East side, large sliding doors

A modern passage door on the east side was cut in on the southerly side but was never trimmed out.



East side, modern passage door on southerly corner

Both basement level doors appear to be in reasonable condition



South side, westerly door

South side, easterly door

**Paint**

As shown in all of the previous building photographs, the paint on the building is in poor condition.

**Connector and Silo**

The connector and silo located on the east side of the barn were later additions to the property in 1960's. The connector is constructed of wood while the silo is made of inter-locking steel panels with steel banding.



East side, connector and silo

The connector is in reasonable condition having been repaired about twenty years ago with a roof and some siding repairs. The floor, however, is not in good condition and needs to be repaired/replaced



East side, southerly connector side



East side, northerly connector side



The silo is also in reasonable condition considering its age but is in need of work to increase its longevity.



Left to right, south easterly view of silo, connector and barn

## Interior

### Lower level

The lower level of the barn contains the remnants of a milking parlor with stanchions for cows. Cows would enter into one lower level door and exit by the other door. This area is in generally good condition. Drainage was added to help elevate any water issues in the lower level. There are no longer stairs from the lower level to the main floor (street level). These stairs would have typically been along the south-west corner of the barn.



Looking east, lower level milking parlor remnants  
Please note the original granite posts that support the first floor main carriers



## Asbestos

Sheet-good materials nailed to the bottom of the ceiling joists may contain asbestos and should be sampled.

## First floor framing and sills

Along with repairs/replacement to the main carriers of the first floor framing, the sills on the south side were extensively repaired/replaced. While these areas constituted the majority of the problems, there are still issues with the west and east gable ends as well as an original design defect along the sill area of the north wall that still needs to be remedied.

On the west façade, the area where one would enter through the large barn doors indicates that there is a problem with the at least the subfloor but most likely an issue of decay with the west sill. It is likely that this problem also exists on the east side.



West façade, under floor at large barn doors threshold

There is a significant, original design deficiency that has caused problems with the north wall. This deficiency, first starts with an undetermined need by the owner (and/or builder ) to lower the height of the foundation along the north wall (and therefore framework/sills) by approximately 12 inches along about one half of the side of the barn. This lowering of the foundation wall runs easterly from about mid-point of the north side and continues on until it meets the east gable end.

While it is not unusual to see barns that have a feature called “sub-sill” to take advantage of the slope and require less stone work at the above ground level, it doesn’t appear to make much sense with a

steep northern slope behind it as in this scenario. A possible plan was to provide light and ventilation in the northeast corner of the lower level.



East and north corner, with the north wall (white arrow)  
Extending down past the height of the top of the stone foundation  
of the east wall (east, south and west walls are all at the same elevation)



North foundation, sub-sill area about half way along north wall



This design flaw, along with problems related to snow load on the roof and how the building is “tied-together” at the top plate height, has resulted in the sill on the north wall to push in along the north foundation wall as seen below.

Without there being a solid sill (8” x 8”) for the first floor joists to attach to, there are only a few main carrier connections that can keep this wall from kicking-in.



North sill and foundation wall  
(with “arrow” explanation below)

In an effort to keep the foundation wall from continuing to kick into the lower level, two concrete block walls were added to act like buttresses (arrows pointing down). The original blocking under the floor joists (arrow pointing right) has an added piece of framing to tie the floor joist and the framing together (arrow pointing left). The only appropriate connection was in areas in which the main exterior posts are connected to the sill with mortise and tenoned joinery (arrow pointing up).

## Main barn frame

The main barn frame is in reasonable condition with a few exceptions. The spliced “tie beams” that run from the south side of the barn to the north side are attached to the top plates and are also mortise and tenoned over the interior posts. Between the dead load of the rafters, purlins, roof sheathing and roof shingles as well as seasonal snow on the roof, the tie beams keep the building from spreading at the eave height.

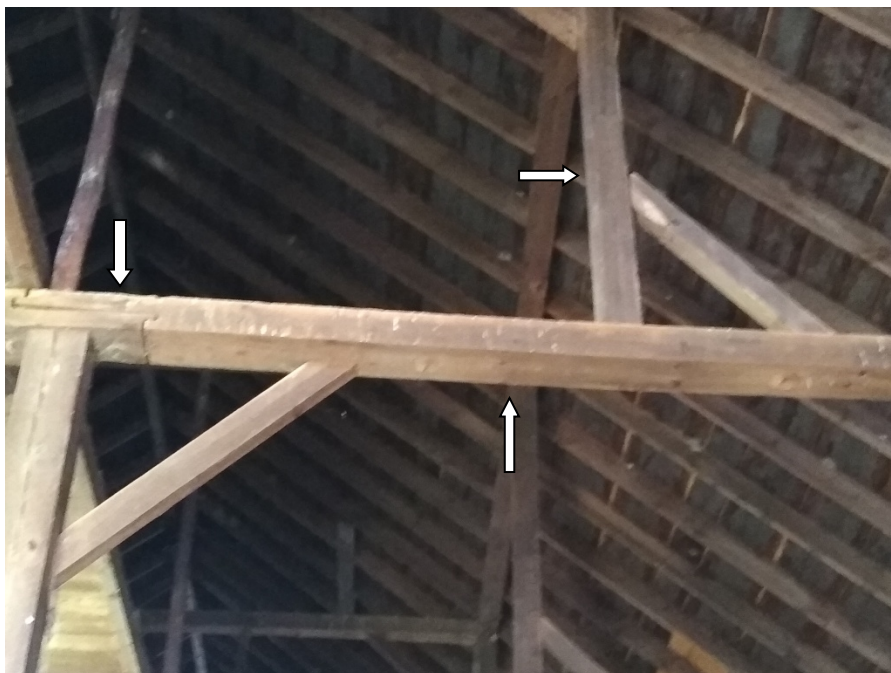
Typically in post and beam construction, the ties are actually one piece and the only areas where the tie can sometimes fail is at the connection to the top plate.

In this later barn, the ties are actually made up in two or three pieces. While the original connection joints (scarf joints) appear to have been made appropriately, the downward pressure on the roof system caused these joints to eventually fail and pull apart.

The addition of a sub-sill on one half of the north wall exacerbated the problem by allowing that section to actual swivel and cause that sill to lean in on the foundation wall.

To make matters worse, there is an auxiliary post that supports the major purlin that is located on top of the tie approximately in the middle of the span between the interior post and the exterior post.

Without adequate support directed to the ground under this post/tie, it has sagged considerably which has increased the pressure on the scarf joint and helped cause it to pull apart.



Northerly section of tie beam  
(downward arrow at scarf joint)  
(right pointing arrow at major support post for major roof purlin)  
(upward arrow at sagging tie beam)



In an effort to keep the barn from spreading at the top plate height, steel cables were added that go from the south side plate all the way across under the tie beam to the north side plate. An additional post was added underneath the post carrying the weight of the major purlin under the roof. This temporary repair appears to be working at this time.



Looking northwesterly, steel cable (upward arrow) added support beam (left hand arrow)

**Electrical System**

A 200 amp service with a new meter box was installed in 2003. The old 100 amp meter box was left for posterity.



West Façade, with old meter box on left and new meter box on right

## Barn floor

The center aisle and the northerly (hay section) of the barn floor are in reasonable condition. The westerly side of the south section however is in need of repair/replacement to allow people to be able to walk in those areas



Barn center aisle looking east



Barn center aisle looking west



## **Recommendations with Costs**

### **Exterior**

#### **Site**

Repair area around northern catch basin  
Increase slope away from lower level south entrances  
Remove brush along south foundation  
Lower elevation in front of west gable end to increase drainage away from building

**Cost \$ 2,600**

#### **ADA Access**

Provide ADA access by allowing cars to drive in the upper and/or lower gates and travel around the barn to the east side. On the east side install a low ramp into the main level of the barn or provide a portable ramp.

**Cost \$ 1,200**

#### **Foundation**

Re-point foundation under sub-sill on the north side, but should be undertaken in conjunction with work on the ties, supports and brackets etc

**Cost \$ 15,000**

#### **Clapboards and trim**

The clapboards and trim should be replaced as needed on a side by side basis with the trim on each side being replaced first before the clapboards are replaced. Clapboards should be carefully “toothed in” unless otherwise mentioned. All trim and clapboards should be back-primed before installation and galvanized nails used throughout. All windows and door headers should be flashed with lead to prevent water infiltration.

Repair the trim on the west side as needed after the sill work mentioned in this report is undertaken. Tooth-in clapboards as needed.

Repair the trim on the south side and then proceed to tooth –in clapboards as needed. The majority of the clapboard replacements will be below and above the first floor windows.

Repair the trim on the east side as needed. Due to the deteriorated condition of the clapboards with more than 50% of the clapboards visibly in need of replacement, replace the existing clapboards with new material (spruce or cedar) to match the existing in size and exposure to the weather. This replacement should be up to the bottoms of the upper level windows at the very least.

Repair the trim on the north side as needed and tooth-in clapboards as needed.

**Cost \$ 48,000**

### **Windows**

Window sash should be repaired as needed. Window sash re-glazed and painted.

**Cost \$ 12,500**

### **Doors**

All of the doors should once again made operable. Repair doors as needed. Install inside fastening hardware for both sets on large barn doors

**Cost \$ 3,500**

### **Paint**

Paint the entire barn after all replacement of the clapboards has been completed. The painting of the barn should include appropriate prepping, priming and then at least one finish coat

**Cost \$ 55,000**

### **Silo and Connector**

#### **Connector**

Repair the connector floor as needed. Install new flashing between the main barn and connector roof as needed. The process should be undertaken with the clapboard replacement on the east side.

**Cost \$ 2,500**



## **Silo**

It is not know at this time the extent of repair to the silo that is needed and also the appropriate method to insure the longevity of the steel panels. Based on the information included in the 2018 Historic Structures Report by the Preservation Co., we have included \$7,000 in the budget for treatment. Any expense above that will be absorbed by the Town of Exeter

**Cost \$ TBD, EST. \$7,000**

## **Interior**

### **Lower Level**

#### **Asbestos**

Have the suspected materials tested. If material is asbestos, have it removed professional by qualified company. If the materials do not contain asbestos, have them removed due to deterioration.

**Cost no asbestos \$ 350 with asbestos \$ 2,500**

### **Stairway**

Build a new code compliant stairway from the lower level to the main barn floor in the south east corner of the lower level. This will allow access again from the lower level to the barn floor so that people do not have to go outside to gain access to the lower level etc.

**Cost \$ 4,000**

### **Brackets**

Fabricate and install brackets on north wall sub sill framing to secure blocking, floor joists and framing together to prevent further damage to the north wall in the area of the sub sill. This work should be done in conjunction with the interior main level ties and supports etc. as well as any north wall foundation work

**Cost \$ 1,200**

### **Repair sills**

Repair sills of east and west gable ends as needed

**Cost \$ 25,000**  
**Main barn level**

Install permanent posts under the area of the tie beam and post under the major purlin on the north side. The new permanent posts need to have adequate support beneath them in the lower level area as well.

After the above work is accomplished, attempt to pull the south and north plates closer together. Fabricate steel brackets to appropriately connect the scarfed tie beam joints together. Remove cables.

**Cost \$ 9,500**

**Main barn floor**

Repair the center aisle and north side of barn as needed. Repair/replace the flooring in the area of the south west side of the barn as needed.

**Cost \$ 6,500**

**Fire Detection and Alarm**

Currently the barn does not have any fire detection and alarm system which would be highly recommended to help protect the barn.

**Cost \$ 12,000**

**Total Project cost**

Sub Total	\$ 208,000
Contingency @ 10%	20,800
Management Fee/General Conditions @ 10%	<u>20,800</u>
<b>TOTAL PROJECT COST</b>	<b>\$ 249,600</b>

### **Recommendations that meet the Secretary of the Interior's Standards**

1. Historical use of the building will continue while providing the community with access.
2. The Historic character will be retained and preserved by not removing any distinctive materials or altering any features, spaces and spatial relationships.
3. No changes will be made that create a false sense of historical development. Only repairs to the existing features are proposed and no conjectural features will be added.
4. Changes to the building that have acquired their own historical significance such as the remnants of the modern milking parlor will not be removed.
5. All distinctive materials, features, finishes, construction techniques or examples of craftsmanship will be maintained. The removal of distinctive items is not contemplated.
6. Deteriorated historic materials will be repaired rather than replaced. Whenever deterioration requires replacement such as the repairs to the clapboards, the minimal amount of replacement will be made by "tooth-ing-out" the clapboards and have them match the old clapboards in size, spacing and color. If needed, replacement of missing features shall always be accomplished by documentation and physical evidence.
7. No chemical or physical treatments are contemplated but if the need arises, the gentlest means possible will be utilized.
8. No archeological resources will be disturbed.
9. A new addition, if contemplated in the distant future, would be constructed so that it is compatible, discernable and subservient.
10. A new addition, if constructed in the distant future, could be removed without disturbing the essential form and integrity of the original structure.



## Supplemental Information

### Secretary of the Interior's Standards

The Standards will be applied taking into consideration the economic and technical feasibility of each project.

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will 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 elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations or related new construction will not destroy historic materials, features and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will 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.

## **Previous Reports**

2002 Historic Structures Report, Monroe & Whittemore Preservation Co  
2017 Barn Mini-Assessment Report, New Hampshire Preservation Alliance, Ian Blackman  
2018 Historic Structures Report Update, Monroe & Whittemore Preservation Co

## **Preservation Briefs**

The following preservation briefs from the National Park Service should be reviewed before work is proposed and/or undertaken:

For re-pointing mortar joints

Brief #2 re-pointing foundations

<https://www.nps.gov/tps/how-to-preserve/briefs/2-repoint-mortar-joints.htm>

For wooden windows

Brief # 9 Wooden Windows

<https://www.nps.gov/tps/how-to-preserve/briefs/9-wooden-windows.htm>

For paint problems

Brief # 10 Paint Problems

<https://www.nps.gov/tps/how-to-preserve/briefs/10-paint-problems.htm>

For increased accessibility

Brief #32 Making Historic Property Accessible

<https://www.nps.gov/tps/how-to-preserve/briefs/32-accessibility.htm>

## **Acknowledgements**

This report would not have been possible without the support and historical research of Kristen Murphy and the Town of Exeter Raynes Barn subcommittee.

All photographs were produced by Bedard Preservation & Restoration LLC