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July 19, 2023

Chuck Reid
Director of Land Stewardship
PO Box 715, New Paltz, NY 12561
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RE: Brook Farm Rehabilitation Project
Existing Barn Inspections

Dear Chuck,

On July 6, 2023, we performed a condition inspection of four (4) barns located at the Brook Farm Site. For the purposes of this report the barns have been given a numerical designation as seen on the attached sketch plan. The following is a summary of the inspection findings for each barn, as well as general recommendations for the structures moving forward.

Barn 1:

Barn 1 is approximately 36' x 24' in area. The structure is single-story with a lower level that that was previously used for agricultural storage. The roof is framed with 2x6 rafters at ±24" on-center. The main level consists of three bents containing hand-hewn lumber and a floor system comprised of 2x10 sawn lumber joists that are supported by beams of varying size and shape. There is no exterior sheathing on any of the barn's walls; vertical plank siding is on each wall. The foundation make-up is highly variable; consisting of one concrete wall poured adjacent to a stone rubble wall, two wood framed walls, and one partial height concrete wall with a wood framed cripple wall above. See Photograph 1 for an overall view of Barn 1.

Roof Level:

- The existing rafters appear undersized for the snow loads they encounter. In addition to this, no ridge member or collar ties are present in the roof which may lead to instability under loading.
- It appears that the original roof was constructed with skip sheathing and cedar shakes. The original roof can be seen from the underside, and it exhibits moderate deterioration throughout. The original roof has been covered with a standing seam metal roof, which is also exhibiting moderate deterioration and rusting.

Main Level:

- The three bents that make up the main level vary in their condition. The Southern bent is in fair condition, the middle bent is in poor condition, and the

Northern bent is in very poor condition. See Photograph 2 for an overall view of the Southern and middle bent.

- The connections at the middle bent have failed. A large split exists on the top of the Eastern post. See Photograph 3.
- The Western wall contains a large barn door for approximately half the length of the building. This door is no longer functioning and has been affixed shut. This wall, and the three other walls contain very limited lateral bracing. See Photograph 4.
- The Northern wall is in extremely poor condition. The wall has experienced lateral movement of approximately 12" due to being pulled outwards by the adjacent pole barn. Holes in the siding have contributed to significant deterioration and cracking of the main members in the bent. See Photographs 5 and 6.
- Approximately 20% of the floor decking is highly deteriorated and is a hazard to anyone walking on it. The remaining 80% of floor decking is soft and exhibits a large amount of deflection under pedestrian load.

Foundation Level:

- No foundation elements appear to be founded below the frost line, making the building subject to seasonal movement.
- The sill plates on each wall are heavily deteriorated due to moisture from being in contact with the ground. The same deterioration is also exhibited on wall studs throughout the foundation. See Photographs 7 & 8.
- Generally, all foundation walls and interior support columns are in poor condition. Differential settlement and significant deterioration is evident throughout.

Barn 2:

Barn 2 is approximately 24' x 24' in area. The structure is single-story with a walk-up attic and a lower level that was previously used to house livestock. The roof, floors, and walls on both levels are wood framed. The quality of lumber in the barn varies drastically (both hand hewn lumber and sawn lumber are present), indicating that this building has been significantly modified since its original construction. Generally, the building is in very poor condition. See Photograph 9 for an overall view of Barn 2.

Roof level:

- The existing rafters are undersized and over-spaced for the loads they encounter. Several of the rafters exhibit significant deflection and deterioration due to previously repaired roof leaks. See Photograph 10.
- It appears that the original roofing consisted of plank skip-sheathing and cedar shakes. This roofing exhibits a high level of deterioration and has been patched over with corrugated metal roofing. See Photograph 10.

Main Level:

- The central beam supporting the attic floor exhibits a significant amount of deflection and the support connections at both ends are failing. See Photographs 11 & 12.
- There are sections of wall where the sheathing has fallen off. The remaining wall sheathing throughout the barn is highly deteriorated. This exposure to the elements has also caused heavy deterioration to the wall studs which in some cases are crumbling and have lost some of their cross sectional area. This is leading to a high degree of instability in the overall structure. See Photographs 13 & 14.

Foundation Level:

- The western side of the barn is partially supported on a stone retaining wall. This wall is composed of large stones, but no mortar, drainage, or tie-back system is present. The wall shows clear signs of settlement and lateral movement. A support beam was located just inside the stone retaining wall and has completely failed, likely due to deterioration from exposure to moisture. See Photograph 15 for these conditions.
- No foundation elements appear to be founded below the frost line, making the building subject to seasonal movement. The barn is supported on wood posts that are in direct contact with the ground. Due to deterioration from the moisture of the ground, several of the support posts have either receded from the ground or settled to the point of separation from the beams. See Photograph 16.

Barn 3:

Barn 3 is approximately 33’ x 20’ in area. The structure is single-story with a walk-up attic and an exposed lower level that is open on three sides. The roof, floors, and walls are wood framed. The North side of the building appears to be an addition that was constructed separately from the original building. Like Barn 2, the quality of lumber in the barn varies drastically (both hand hewn lumber and sawn lumber are present), indicating that this building has been significantly modified since its original construction. See Photograph 17 for an overall view of Barn 3.

Roof Level:

- It appears that the original roofing consisted of plank skip-sheathing and cedar shakes. This roofing exhibits a high level of deterioration and has been patched over with corrugated metal roofing. See Photograph 18.
- The rafters in both sections of the barn appear over-stressed for the loads they encounter, significant deflection is visible.

Main Level:

- The exterior wall sheathing is heavily deteriorated throughout the building (particularly towards the bottom of the walls).
- The wood sills at grade level show extensive deterioration. On the West side of the building, the sills have crumbled and settled significantly. The soil at this location is eroding and creating a gap between the stone retaining wall and the building, which is a safety concern for any member of the public walking near the building. See Photograph 19.

Foundation Level:

- The western side of Barn 3 is founded on a stone retaining wall. The North end of this wall has failed and caused a substantial amount of settlement to the building. See Photograph 20.
- The remainder of the foundation consists of tapered concrete piers, some of which were formed with metal garbage cans. None of the existing piers appear to be founded below the frost line, making them subject to seasonal movement.
- The piers are generally in poor condition, showing lateral displacement, cracking, and a lack of connection to the wooden support columns. See Photographs 21 & 22.

Barn 4:

Barn 4 is a single-story structure with a lofted attic space. The roof and walls are constructed with sawn lumber. Generally, the building is in very poor condition. See Photograph 23 for an overall view of Barn 4.

Roof Level:

- The existing gable roof is poor condition. The rafters are undersized and there is no ridge member to facilitate a rafter connection.
- Plank sheathing was visible from the underside of the roof, which exhibited moderate deterioration. Corrugated metal roofing was visible from the exterior.

Main Level:

- The entire rear end of the building has either collapsed or was demolished and left in ruins. It appears that there was a wood framed shed roof and wood framed walls in this location. See Photograph 24. The collapse of the rear portion of the building has left the remaining portion in a state of instability.

Foundation Level:

- There is no evidence of a true foundation in this barn. The wood sill plates are in direct contact with the ground and crumble when touched. See Photograph 25. The barn has settled significantly into the ground because of this. The exposure to moisture has also deteriorated the bottom of all remaining wall studs, which contributes to the instability to the structure.

General Conclusions & Recommendations:

In general, Barns 2, 3, and 4 are in a severely deteriorated state. By today's standards, the original construction methods of these barns would be considered unacceptable. The construction methods used, combined with long term exposure to the elements has led these building to become unstable and potentially hazardous to the public. As they sit, these structures represent a liability to the Mohonk Preserve.

Repairing these barns to a safe condition that complies with today's construction standards would require an extraordinary amount of labor and capital. This process would essentially entail completely removing each structure and rebuilding it in a more robust manner. The cost of this project, combined with the understanding that the Mohonk Preserve does not have a use-case for these buildings leads us to conclude that the most suitable course of action is to demolish these buildings and not rebuild them.

Barn 1 is also in a severely deteriorated state. It is understood however, that the Mohonk Preserve is interested in exploring options to rehabilitate this structure in-place. Considering the degree of instability that this structure exhibits, this will be a very challenging project. It is my opinion that this structure will need to receive an entirely new foundation that is founded below the local frost line and capable of supporting the loads above. This will require the entire superstructure be lifted off the existing foundation and temporarily supported while the new, properly designed elements can be constructed. We recommend an experienced house moving/lifting company be employed, for the lifting, temporary support, and resetting of the building; such as Larmon House Movers.

A large impediment to performing this foundation replacement is that the upper portion of the building is currently too unstable to lift. Several items would need to be resolved before the building could be lifted; including but not limited to the following list:

- Significant repairs to key structural connections
- The reframing of ±50% of the walls
- Installation of exterior sheathing
- Installation of a substantial amount of lateral bracing

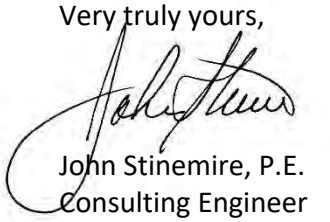
Another impediment to this operation is that the adjacent pole barn is connected to Barn 1 and appears to be supporting the southern wall. It is our understanding that this adjacent pole barn is slated to be demolished. Prior to the pole barn being demolished, the southern wall of Barn 1 would need to be carefully shored, repaired, and isolated from the pole barn.

It is our opinion that the cost of performing this renovation and turning Barn 1 into a useable structure *will be greater* than the cost of completely demolishing the building and reconstructing an unconditioned, agricultural style building in kind at the same location.

This report is based on a field inspection of the exposed structural components only and represents the observation of conditions found at the time of inspection. Areas that were concealed or inaccessible at the time of inspection and that could not be visually observed are not covered as part of this inspection. This is a condition inspection only and does not include any conclusions regarding load capacity or overall structural design capabilities of the subject buildings.

Should you have any questions please contact me.

Very truly yours,



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BROOK FARM SITE SKETCH

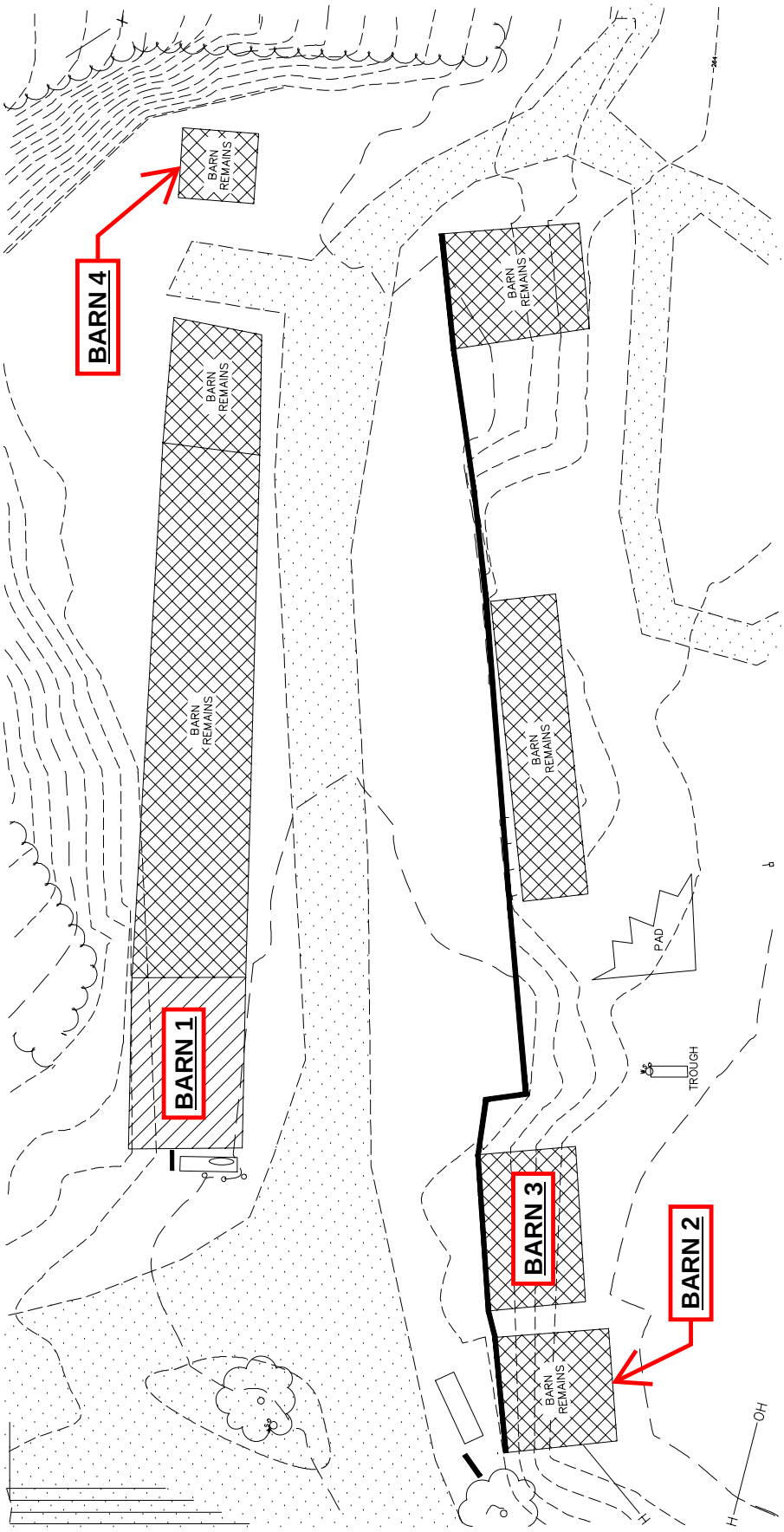

Photo 1-Barn 1:
Overall exterior view of Barn 1.

Photo 2-Barn 1:
View of Southern and middle bents.

Photo 3-Barn 1:
View of crack in Eastern post of the middle bent in Barn 1. The lower connection at this bent has also failed.

Photo 4-Barn 1:
View of Western wall with non-functioning door. All walls at this level contain little-to-no lateral bracing.

Photo 5-Barn 1:
View of significant movement and deterioration in the Northern bent.

Photo 6-Barn 1:
Exterior view of lateral movement to the North. The adjacent pole barn has pulled the northern wall of Barn 1 outward.

Photo 7-Barn 1:
View of deteriorated sill plate in Barn 1. This has caused significant settlement to the building.

Photo 8_Barn 1:
View of wall studs significantly deteriorated an no longer in contact with the sill plate or the ground.

Photo 9-Barn 2:
Overall view of Barn #2 from the lower side.

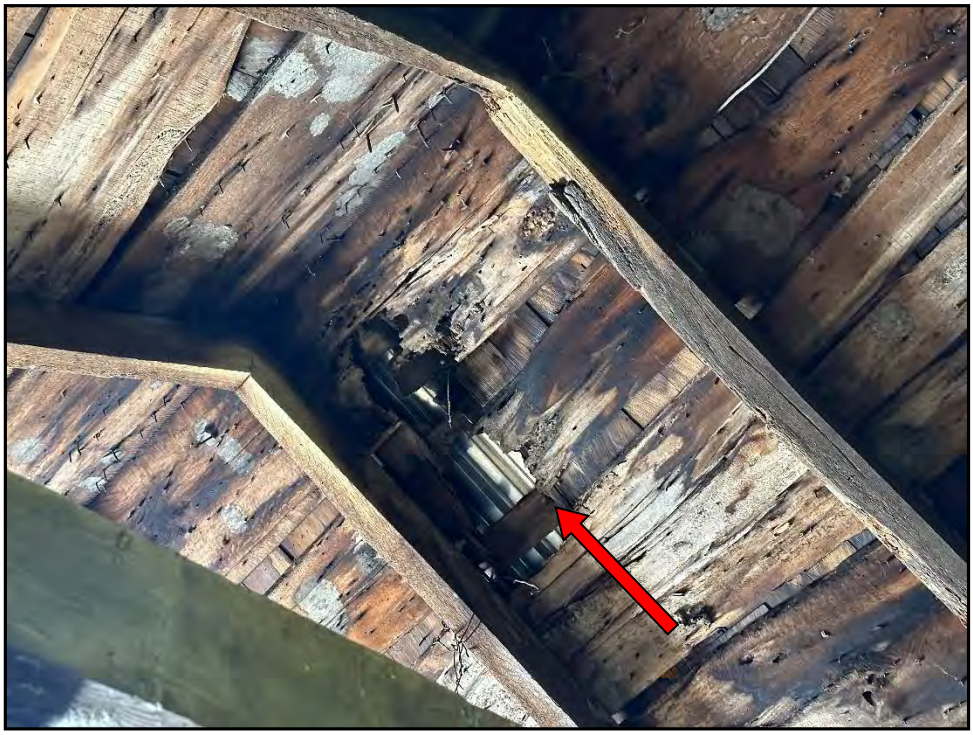

Photo 10-Barn 2:
View of undersized rafters with no ridge board in Barn 2. Significant deflection is present and some rafters show signs of section loss.
Also view of highly deteriorated roof sheathing that has been covered with corrugated metal roofing. This condition is typical throughout.

Photo 11-Barn 2:
View of Barn 2 support beam exhibiting significant deflection.

Photo 12-Barn 2:
View of failing main support beam connection.

Photo 13-Barn 2:
View of wall with missing sheathing. This has allowed the building to be subject to rain, snow, and sun exposure.

Photo 14-Barn 2:
View of wall stud exposed to a gap in sheathing. Stud is crumbling and has lost ±30% of its section.

Photo 15-Barn 2:
View of stone retaining wall with no mortar and visible gaps. View of edge support beam that has dynamically failed.

Photo 16-Barn 2:
View of highly deteriorated corner support post. The post is no longer in contact with the ground. This level of deterioration is typical throughout.

Photo 17-Barn 3:
Overall View of Barn 3.

Photo 18-Barn 3:
View of highly deteriorated roof sheathing.

Photo 19-Barn 3:
View of erosion at the deteriorated sill of Barn 3. This is creating a gap between the stone retaining wall and the wall of the barn.

Photo 20-Barn 3:
View of stone retaining wall at Barn 3. The wall has failed and caused significant settlement to the building.

Photo 21-Barn 3:
View of failing concrete pier. Framing above this location is essentially unsupported.

Photo 22-Barn 3:
View of cracked concrete pier.

Photo 23-Barn 4:
Overall view of Barn 4.

Photo 24-Barn 4:
View of collapsed portion on rear side of Barn 4.

Photo 25-Barn 4:
View of heavily deteriorated sill plate at Barn 4.