

MBP

**Potomac Horse Center
North Potomac, Maryland
Facility Condition Assessment Report**

November 22, 2023



Prepared for
M-NCPPC/Montgomery County Parks
8301 Turkey Thicket Drive, 2nd Floor
Gaithersburg, MD 20879

J23159.001



November 22, 2023

The Maryland-National Capital Park and Planning Commission (M-NCPPC)
Public Affairs & Community Partnerships Division
Montgomery Parks
9500 Brunett Avenue
Silver Spring, Maryland 20901

Attention: Mike Moxley
Project Manager 2

Reference: **Potomac Horse Center**
Facilities Condition Assessment – Final Report
North Potomac, Maryland

Dear Mr. Moxley,

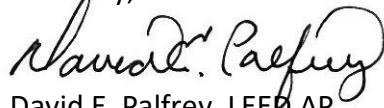
MBP is pleased to provide this facility condition assessment of the structural and life-safety systems of the 11 buildings and ancillary structures including one private residence, one dormitory, two arenas, four barns, three storage buildings, and the general condition of the paved roadways, parking areas, and stormwater drainage features at the Potomac Horse Center.

MBP performed our services in accordance with the scope of work and procedures outlined in our approved proposal dated August 3, 2023, and associated with Purchase Order 553618 dated August 29, 2023.

The report includes a summary of our field observations together with our projection of capital expenditures that are anticipated to be necessary in order for the Maryland-National Capital Park and Planning Commission (M-NCPPC) to maintain its facilities in an operational condition with a high level of reliability.

We appreciate the opportunity to continue our relationship with M-NCPPC. Please feel free to contact me at dpalfrey@mbpce.com or 703-895-7766 if you have any questions or require additional information.

Sincerely,


David E. Palfrey, LEED AP
Senior Project Manager

Enclosure

cc: Project File J23159.001

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A. Executive Summary

MBP, with our subconsultants, GHD (Life Safety) and SGH (Structural), conducted a limited survey of existing conditions at the Potomac Horse Center (PHC) located at 14211 Quince Orchard Road, North Potomac, Maryland for the Maryland-National Capital Park and Planning Commission (M-NCPPC or Client). MBP completed the survey of the 11 buildings and ancillary structures, including the farmhouse, red brick house, one dormitory, two arenas, four barns, three storage buildings, and the general condition of the paved roadways, parking areas, and stormwater drainage features. See the aerial photographs showing facility layout below.

It was reported to us that three structures did not require our review at the time of our site visit. The structures included: Dormitory One (to be demolished), Sawdust Storage Barn (to be demolished), and the Mary's Trailer (to be removed).





The survey and assessment included the following components:

- Mechanical (HVAC), Electrical, Plumbing, and Life Safety (MEPLS) – Observed the condition and age of these related building systems and commented on their condition, visible deficiencies, and sufficiency for their intended use.
- Roofing Systems – Observed the current condition of the roofing systems, accessories, and details. Observed flashing and penetration details for condition and conformance with accepted practice. Such observations were based on those conditions that could be

observed from the ground. Exploration, testing, roof cores, or man-lift or swing-stage drops for up-close observations were not included.

- Building Exterior Elements – Observed the current condition of the building envelope, including the exterior walls, windows, and door systems. Such observations were based on those conditions that could be observed from the ground.
- Structural Systems – Observed and evaluated the primary and ancillary structures for signs of distress.
- Interior – Evaluated the condition of interior finishes, floors, wall coverings, ceilings, doors/openings, lighting, corridors, restrooms, and common areas through visual observation.
- Site – Observed visible elements by non-destructive methods on the site surface. This included site access, lighting, landscaping, retaining walls, fences, stormwater management, and site drainage. Associated pavement systems were observed to assess their general condition.
- Accessibility Compliance – MBP conducted a perfunctory site reconnaissance to observe major systems that may not comply with the applicable accessibility requirements.

General conditions of the buildings varied widely, as some building components were in good condition while others were in poor condition. The table below outlines the repair costs associated with our observations.

Repair Cost						Total
Farmhouse	Equipment Storage	Workshop	Top Barn	Dormitory Two	Rear Barn	
\$78,910.98	\$10,269.50	\$127,198.63	\$149,509.71	\$100,375.18	\$151,175.40	
Main Barn	Large Arena	Grey Barn	Small Arena	Red Brick House		
\$578,693.04	\$290,850.19	\$136,654.86	\$185,857.30	\$17,362.71		\$1,826,857.50

During our survey it was observed that numerous areas would require further structural investigations to determine the appropriate repairs. MBP recommends that the M-NCPPC have a professional engineer conduct detailed studies for each of these prioritized items. These additional studies will be necessary to further define building code requirements and/or any issues relating to system performance and operation. This will establish the actual scope of work for obtaining trade contracts to perform repairs for, and/or replacement of, specific components.

Structural Investigation	
Duration:	2 days, 2 engineers
Cost:	\$7500
Included in Cost:	<p>Farmhouse - Measure existing flood framing and identify extent of termite damage.</p> <p>Top Barn - Survey and identify locations of damaged cladding.</p> <p>Dormitory Two - Observe condition of roof framing in attic space and second floor framing at stained ceiling tiles.</p> <p>Rear Barn - Observe condition of roof framing and walls above hayloft.</p> <p>Main Barn - Check every column for signs of decay below grade. (Need access to horse stalls to complete evaluation).</p> <p>Large Arena - Install crack monitors on CMU wall. - Measure existing wind girts to check capacity to support roof framing of the addition.</p>
Not Included in Cost:	<p>Farmhouse - removal of insulation between joists to permit observation of existing framing and reinstall insulation.</p> <p>Large Arena - lift/ladder access to measure existing steel framing supporting the roof of the addition.</p>

Note: The cost indicated above assumes investigation of all buildings is authorized to occur simultaneously.

Our review indicated numerous repairs. It is our opinion that the structural investigations mentioned above should be priorities, along with the life safety issues identified. In addition, several structural issues were noted that could present an imminent danger. These issues include the hole in the 2nd floor decking of the Top Barn and the condition of the Smokehouse. Upgrades and repairs to the main barn should also be considered a high priority, as this structure currently houses numerous horses and the business offices, and is generally open to the public. The remaining building repairs can be accomplished as you see fit, giving priority to structural issues.

B. Scope of Services

The MBP team performed a limited facility condition assessment of the designated buildings at the PHC for the M-NCPPC. The purpose of the assessment was to document the condition of selected building components and project the expected capital repair and replacement expenditures needed over the next ten years. An expected outcome of the assessment was the development of useable information, based on actual site conditions, for capital budgeting purposes. The assessment was not intended to be a design-level survey for the purpose of soliciting bids for construction of the recommended repairs or to develop detailed scopes of work for maintenance and repairs. The assessment was limited to the observed condition and probable life expectancy of the systems.

Interviews and Visual Assessment

- 1. Interviews:** The MBP team conducted interviews with Mike Moxley of Maryland Parks and Ms. Gingras of Potomac Horse Center, Inc., who provided relevant information about each building's history and operation.
- 2. Visual Assessment:** The MBP team conducted a visual assessment of the existing structures. This assessment included the identification of equipment, the approximate age of equipment, expected remaining useful life, condition, and conformance with applicable building codes and standards. Observations were limited to those conditions, which could be viewed without the use of ladders or other equipment.

The assessment was visual in nature and not intended to be destructive to the facilities in order to gain access to hidden conditions. Our scope of services included only those items specifically indicated in the report and did not include sampling, testing, or evaluation of asbestos, lead-based paint, lead-in-water, indoor air quality, radon, mold, or any other potentially hazardous materials, air-borne toxins, or issues not outlined in the scope of services.

Analysis and Reporting

This report provides a description of the existing system's age (where this could be determined) and condition for the purpose of potential capital expenditures and proposed improvements. Opinions of cost associated with replacing, repairing, or upgrading these components are provided in summary form and include an estimate of the expected useful life and remaining useful life of the systems evaluated.

The opinions of cost generally exclude associated fees, as appropriate, for performing the work, such as design, contract administration, building permits, but include contingency to cover unknowns. The opinions of cost are based on the anticipated costs as calculated using present values, un-escalated to the future time when capital expenditure would occur. They do not include fees or charges related to the building occupancy, tenant costs, work completed outside of normal business hours, or other lease or ownership related costs of which MBP would be unaware.

The timing of the recommended repairs or replacements, and associated costs, represent our professional opinion considering the aforementioned factors. Alternative methods of managing the existing equipment or systems may be feasible; however, these will depend on actual management practices, financing requirements, and the ability of M-NCPPC operations, and maintenance staff to perform some of the repairs in-house. Any alternative scenarios that have not been presented to MBP would not be considered in our report.

C. Summary of Observations and Probable Cost

MBP has provided separate summaries for each of the 11 buildings reviewed. Included in each summary are our observations and recommendations to remediate the indicated issues. A table of probable cost associated with the repairs is also included.

**Summary:**

The Farmhouse is a wood framed, two-story, single-family dwelling with a stone foundation and a central brick chimney. It includes one sleeping room on the main floor and three sleeping rooms on the upper level. It has a front and a rear entryway, a common staircase between the main and second floor, and a divided cellar with two access points. One from a hatch in the kitchen floor ("Basement 1"), and an exterior stairwell located in the back yard to access the other side of the cellar ("Basement 2"). The cellar and attic spaces are unfinished. The main utilities are in Basement 1.

The Farmhouse was indicated to be supplied by the local water service and connected to the sewer system of the County. The mechanical and plumbing systems included a heat pump system, a window air conditioner for the enclosed porch, and an electric water heater. The heat pump compressor was located at the rear of the building and the air handling unit was in the attic. The water heater was located in the basement. The compressor was indicated to have been manufactured in April of 2001 (22 years old), indicating it is beyond its normal useful life of 15-20 years. The roof appears in good condition and the tenant noted that it was replaced within the recent past.

In addition to the main house, there is a small structure on the property known as the Smokehouse. The Smokehouse is a wood framed shed type structure with metal roofing over a slab-on-grade foundation.

Life Safety:

L 1.1 **Observation:** The Farmhouse is equipped with a fire extinguisher, located in the closed-in front porch, underneath a table.

Recommendations: Fire extinguisher should be located within the building, in a conspicuous location so that is readily available for occupant use. This is so that occupants do not re-enter the building to fight the fire after having exited.

L 1.2 **Observation:** The Farmhouse is equipped with Single Station smoke alarms located within each sleeping room, with the exception of the sleeping room located on the first floor.

Recommendation: Provide Smoke alarms in the sleeping room and outside of the sleeping room in the immediate vicinity of the sleeping room, on the first floor (NFPA 101, 24.3.4.1.1).

L 1.3 **Observation:** The Farmhouse is equipped with a combination Smoke and CO detector alarms above the stairs from the first floor to the second floor, however the first floor is not equipped with a CO alarm.

Recommendation: Provide combination Smoke/CO alarm at the base of the stairs, outside of the first floor sleeping room in the immediate vicinity of the sleeping room (NFPA 101, 4.3.4.2.2).

L 1.4 **Observation:** Storage present within Attic stairs.

Recommendation: Move storage out of stairs to attic in order to keep egress from attic clear.

L 1.5 **Observation:** Exterior stairs do not have handrails.

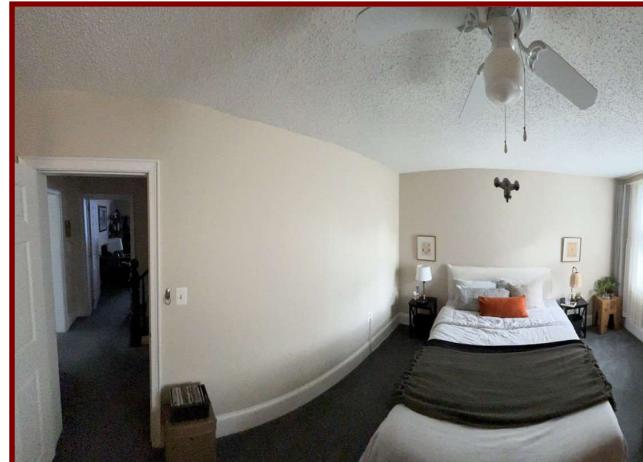
Recommendation: Provide minimum of one handrail for stairs at front of building (NFPA 101, 7.2.2.4.1.6)

Life Safety References:

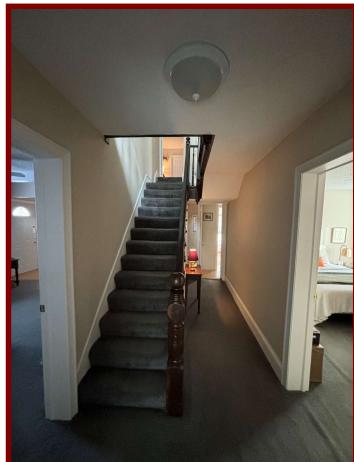
- NFPA 101
- Group R-3 (IBC)



L 1.1 – Fire Extinguisher Location



L 1.2 – First Floor Sleeping Room (No Smoke Alarm)



L 1.3 – First Floor Stairwell (No CO Alarms)



L 1.4 – Storage in Attic Stairs



L 1.5 – Exterior Stairs

Structural:

S 1.1 Observation: There are a number of small cracks in the exterior finish, which consists of wood sheathing, a membrane, wire mesh, and a cementitious pebble mesh coating. If left untreated these cracks provide a route for water entry into the wall assembly, which will result in additional cracking and damage as water freezes and thaws. Painted lumber, such as the underside of eaves, is also chipped and peeling in some locations, exposing the wooden substrate to the elements.

Recommendations: Repair and seal cracks. Repaint areas where paint is significantly weathered. Refer to architectural recommendations for additional information.

S 1.2 Observation: In Basement 1, 4x4 wood shoring posts and wood sills have been installed to support termite-damaged original first floor joists. These sills rest directly on the gravel floor of the basement space. Per the tenant, termite inspection and insecticide spraying takes place every June, and there has been no known new activity in quite some time. However, the sills are discolored, indicating exposure to moisture. Other vulnerable elements in this space, such as the metal electrical box, are also corroded. If no action is taken the ambient humidity will continue to degrade the wooden sills and posts, eventually leading to a loss of structural capacity.

Recommendations: Investigate condition of existing floor framing to determine if current extent of shoring is sufficient. If shoring is desired, then take following measures to protect shoring from moisture damage:

- Paint shoring posts and headers to provide protection against moisture exposure.
- To permanently remediate the situation, elevate new pressure treated (PT) sills from gravel floor with concrete curbs or masonry foundations to prevent moisture wicking from grade. Confirm the new sills (PT) and posts are sufficiently sized to meet code requirements.
 - o Alternatively, sister the termite-damaged wood joists with new, pressure-treated lumber or replace existing floor framing with new PT framing.

S 1.3 Observation: Mortar for stone foundation walls is significantly degraded at many locations in both basements. It is likely and not unexpected that the soft mortar has weathered away over time since the building was constructed.

Recommendations: Repoint the foundation walls where mortar has degraded utilizing a pointing mortar that is compatible with the historic nature of the stone wall construction. If during this process walls are noticed to have moved significantly out of plumb, consider selectively rebuilding these sections.

S 1.4 Observation: Multiple first floor joists spanning above Basement 2 are notched to about half their depth to provide a run for electrical conduits. This significantly reduces their structural capacity.

Recommendations: Remove and relocate existing conduit. Provide new full-length pressure-treated joist sisters to reinforce notched joists around the locations of the notches.

S 1.5 Observation: The Smokehouse slab on grade is heavily cracked and is completely degraded below many perimeter bearing wall wood sill plates.

Recommendations: The existing slab is not suitable for continued use. We recommend replacing the slab as part of a full smokehouse repair or replacement project. Coordinate slab on grade requirements with the needs of the shed repairs or replacement as outlined in the following section below.

S 1.6 Observation: Due to the degradation of the Smokehouse slab on grade many structural members and the adjoining walls have undergone significant lateral movement, many of which now rest directly on soil. Most of the vertical columns and braces have severe termite and water damage. Daylight is clearly visible through many sections of the structure.

Recommendations: The structure is currently unstable. We recommend immediate action to avoid unintended collapse of the building. If the structure is historic and warrants retention, then we recommend immediate installation of temporary shoring to support the roof and walls to allow for the replacement of severely damaged framing members. Assume all posts and braces need to be replaced for pricing. Alternatively, if the building is not historically significant, we recommend demolishing and replacing with a stable shed structure.



S 1.1 – Chipped and peeling paint at underside of closed eave.



S 1.2a – Basement 1 wall. Note corrosion on electrical box.



S 1.2b – Shoring in Basement 1. Note signs of moisture present at bottom of sills on gravel grade.



S 1.3 – Basement 2 framing and stone masonry foundation wall.



S 1.4 – Notch cut in Basement 2 joists for run of electrical conduit.



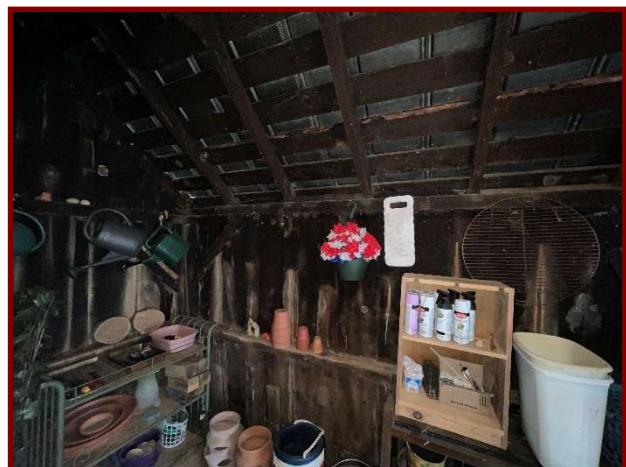
S 1.5 – Smokehouse wall near entrance. Note slab on grade has deteriorated and wall is unsupported. Common condition.



S 1.6 – Northeast corner of Smokehouse. Note column and adjoining walls have shifted significantly.



Smokehouse exterior. Siding and paint is deteriorated.



Smokehouse interior.

General Conditions:

G 1.1 **Observation:** The air conditioning system compressor was manufactured by Carrier and indicated as having been manufactured in April of 2001 (22 years old), indicating it is beyond its normal useful life of 15-20 years. The date of manufacture of the window air conditioner could not be determined.

Recommendation: Replace the air conditioning systems. Due to the phase out of R410a refrigerant, the entire system should be replaced.

G 1.2 **Observation:** The electric water heater was covered with an insulated jacket in Basement 1 and it was not removed to inspect the tag. Based upon the age of other heaters in the complex, it was assumed that it was beyond its normal useful life of 8-12 years.

Recommendation: Replace the water heater.

G 1.3 **Observation:** The electric service panel was located in Basement 1. Due to the high humidity levels the panel was showing signs of deterioration.

Recommendation: Replace the electrical panel.



G 1.1a – Exterior Unit.



G 1.1b – Air Conditioning System



G 1.1c – AHU in attic.



G 1.1d – Window Unit.



G 1.2 – Water heater.



G 1.3 – Electric Service Panel.

	Description	QTY	Unit	Material	Material	Labor	Labor	Sub/Equip	Sub / Equip	Unit	Total	Total Cost With Markup
				Unit	Total	Unit	Total	Unit	Total	Price	Cost	
Farmhouse												
L1.1	Relocate fire extinguisher to interior of building	1	EA									\$ 18.77
	Relocate fire extinguisher to interior of building	1	EA	\$ -	\$ -	\$ 12.50	\$ 12.50	\$ -	\$ -	\$ 12.50	\$ 12.50	
L1.2	Provide Smoke alarms	2	EA									\$ 180.22
	Provide Smoke alarms in the sleeping room and outside of the sleeping room in the immediate vicinity of the sleeping room, on the first floor	2	EA	\$ 35.00	\$ 70.00	\$ 25.00	\$ 50.00	\$ -	\$ -	\$ 60.00	\$ 120.00	
L1.3	Provide combination Smoke/CO alarms	1	EA									\$ 112.63
	Provide combination Smoke/CO alarm at the base of the stairs, outside of the first floor sleeping room in the immediate vicinity of the sleeping room	1	EA	\$ 50.00	\$ 50.00	\$ 25.00	\$ 25.00	\$ -	\$ -	\$ 75.00	\$ 75.00	
L1.4	Move storage	1	LS									\$ 37.54
	Move storage out of stairs to attic in order to keep egress from attic clear.	1	LS		\$ -	\$ 25.00	\$ 25.00	\$ -	\$ -	\$ 25.00	\$ 25.00	
L1.5	Exterior stairs do not have handrails.	1	LS									\$ 525.63
	Provide minimum of one handrail for stairs at front of building	1	LS	\$ 250.00	\$ 250.00	\$ 100.00	\$ 100.00	\$ -	\$ -	\$ 350.00	\$ 350.00	
S1.1	Exterior finish repairs	1	LS									\$ 3,902.60
	Repair and seal cracks.	1	LS	\$ 343.14	\$ 343.14	\$ 744.60	\$ 744.60	\$ -	\$ -	\$ 1,087.74	\$ 1,087.74	
	Repaint areas where paint is significantly weathered.	1	LS	\$ 127.68	\$ 127.68	\$ 1,383.20	\$ 1,383.20	\$ -	\$ -	\$ 1,510.88	\$ 1,510.88	
S1.2	Basement shoring repairs	1	LS									Pricing by others
S1.3	Mortar for stone foundation wall repairs	1	LS									\$ 1,524.97
	Repoint the foundation walls where mortar has degraded utilizing a pointing mortar that is compatible with the historic nature of the stone wall construction.	1	LS	\$ 566.48	\$ 566.48	\$ 448.95	\$ 448.95	\$ -	\$ -	\$ 1,015.43	\$ 1,015.43	
S1.3 Alternate	Mortar for stone foundation wall repairs	1	LS									\$ 17,600.74
	If during this process walls are noticed to have moved significantly out of plumb, consider selectively rebuilding these sections.	1	LS	\$ 10,044.80	\$ 10,044.80	\$ 1,674.99	\$ 1,674.99	\$ -	\$ -	\$ 11,719.79	\$ 11,719.79	
S1.4	Floor joists structural repairs	1	LS									\$ 11,485.00
	Remove and relocate existing conduit.	1	LS	\$ -	\$ -	\$ 2,992.50	\$ 2,992.50	\$ -	\$ -	\$ 2,992.50	\$ 2,992.50	
	Provide new full-length pressure-treated joist sisters to reinforce notched joists around the locations of the notches.	1	LS	\$ 3,325.00	\$ 3,325.00	\$ 1,330.00	\$ 1,330.00	\$ -	\$ -	\$ 4,655.00	\$ 4,655.00	
S1.5	The Smokehouse slab on grade is heavily cracked and is completely degraded below many perimeter bearing wall wood sill plates.	1	LS									\$ 13,692.33
	We recommend replacing the slab as part of a full smokehouse repair or replacement project.	1	LS	\$ 795.25	\$ 795.25	\$ 8,320.10	\$ 8,320.10	\$ 1.94	\$ 1.94	\$ 9,117.30	\$ 9,117.30	
S1.6	Smokehouse structural member and wall repairs	1	LS									\$ 11,699.00
	If the structure is historic and warrants retention, then we recommend immediate installation of temporary shoring to support the roof and walls to allow for the replacement of severely damaged framing members.	1	LS	\$ 1,860.00	\$ 1,860.00	\$ 930.00	\$ 930.00	\$ -	\$ -	\$ 2,790.00	\$ 2,790.00	

Area	Description	QTY	Unit	Material	Material	Labor	Labor	Sub/Equip	Sub / Equip	Unit	Total	Total Cost With Markup
				Unit	Total	Unit	Total	Unit	Total	Price	Cost	
	Assume all posts and braces need to be replaced for pricing.	1	Allow					\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	
S1.6												
Alternate	Smokehouse structural member and wall repairs	1	LS									\$ 31,687.93
	Alternatively, if the building is not historically significant, we recommend demolishing and replacing with a stable shed structure.	1	LS	\$ 18,600.00	\$ 18,600.00	\$ 2,500.00	\$ 2,500.00	\$ -	\$ -	\$ 21,100.00	\$ 21,100.00	
G1.1	Air conditioning repairs		LS									\$ 4,835.79
	Replace the air conditioning systems.	1	LS	\$ 2,350.00	\$ 2,350.00	\$ 870.00	\$ 870.00	\$ -	\$ -	\$ 3,220.00	\$ 3,220.00	
G1.2	Water Heater replacement	1	LS									\$ 1,647.47
	Replace the water heater.	1	LS	\$ 835.00	\$ 835.00	\$ 262.00	\$ 262.00	\$ -	\$ -	\$ 1,097.00	\$ 1,097.00	
G1.3	Electrical panelboard replacement	1	EA									\$ 3,649.37
	Replace the electrical panel.	1	EA	\$ 1,600.00	\$ 1,600.00	\$ 830.00	\$ 830.00	\$ -	\$ -	\$ 2,430.00	\$ 2,430.00	
	Subtotal - Direct Cost				\$ 40,817.35			\$ 22,498.84		\$ 5,001.94		\$ 68,318.13
	Sales and Locality Tax	6	%							\$ 300.12		\$ 300.12
	Subtotal											\$ 68,618.25
	General Conditions	15	%									\$ 10,292.74
	Subtotal											\$ 78,910.98
	Contingency	30	%									\$ 23,673.30
	Subtotal											\$ 102,584.28
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)											\$ 102,600.00

**Summary:**

The Equipment Storage building is a large rectangular Storage Occupancy structure with pole-barn style framing, wood trusses, and metal siding and roofing. It has two standard-sized doors, one on each side of the building, as well as a roll-up door for equipment.

The structure consists of regularly spaced wood posts which act as columns for the transfer of gravity loads to the ground. Through their embedment in the soil, these columns also serve as the primary lateral system for the building through direct contact with the soil subgrade. The corrugated metal walls are backed by regularly spaced wind girts, which laterally support the sheathing panels and transfer load to the columns. Dimensional lumber spandrel beams transfer load from the wood truss roof structure to the wood posts. The wood trusses are unbraced at their bottom chords and assembled from dimensional lumber and mending plates. Trusses span the width of the structure and are connected to spandrel beams with metal hurricane ties. The metal roofing is backed by wood purlins that transfer gravity and lateral loads to the trusses.

Life Safety:

L 2.1 **Observation:** The Equipment Storage building contains a fire extinguisher that has no maintenance tags and appears to be past its useful life. Storage occupancies require a fire extinguisher per (NFPA 1, 13.6.1.2).

Recommendations: Provide a new fire extinguisher in a conspicuous location that is readily accessible. Locate the fire extinguisher on a fixed surface.

Life Safety References:

- NFPA 101
- Group S-1 (IBC)



L 2.1a – Fire Extinguisher



L 2.1b – Fire Extinguisher Location

Structural:

S 2.1 **Observation:** The gravel grading at the building exterior is higher than interior floor finish, creating a condition where the sheathing and plywood siding are partially covered and exposed to water during rainfall events. The grade at some sections of the building exterior is not sloped to shed rainwater away from the building. Exposure to rainfall will accelerate corrosion of metal and rotting of wood.

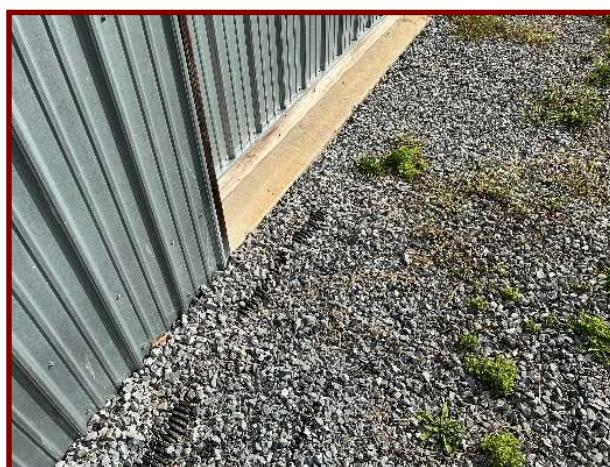
Recommendation: Inspect elements below grade for water damage and replace rusted metal and rotted wood with pressure-treated wood as necessary. Regrade the exterior so that water drains properly, and soil/gravel does not abut metal or wood elements. Keep top of exterior grade below exterior finishes and at least 6-inches below interior concrete slab.

S 2.2 **Observation:** We observed corroded metal panels on the north end of the building. Rusting appears to be localized to only a few panels.

Recommendation: At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal. Where sheathing has completely weathered away, replace the sheathing in-kind.



S 2.1a – Posts cast into concrete at northeast side of structure. Note staining at pole bottoms and plywood siding at grade.



S 2.1b – Exterior at grade. Siding appears in good condition, but lack of waterproofing at grade may lead to future distress.



S 2.2 – Exterior view at northwest side.
Note corroded siding at north end of building.



View of west side of structure. Note hurricane ties connecting trusses to spandrel beams.



Exterior view of Equipment Storage structure.



Interior view of Equipment Storage structure.

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Equipment Storage												
L2.1	New Fire Extinguisher	1	LS									\$ 272.24
	Provide a new fire extinguisher in a conspicuous location that is readily accessible.	1	LS	\$ 125.00	\$ 125.00	\$ 50.00	\$ 50.00	\$ -	\$ 175.00	\$ 175.00		
S2.1	Building exterior	1	LS									\$ 13,127.76
	Inspect elements below grade for water damage and replace rusted metal and rotted wood with pressure-treated wood as necessary.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	
	Regrade the exterior so that water drains properly, and soil/gravel does not abut metal or wood elements.	1	LS	\$ -	\$ -	\$ 400.00	\$ 400.00	\$ 270.00	\$ 270.00	\$ 670.00	\$ 670.00	
S2.2	Metal panels	1	LS									\$ 4,307.27
	At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal.	1	LS	\$ 306.00	\$ 306.00	\$ 195.00	\$ 195.00	\$ -	\$ -	\$ 501.00	\$ 501.00	
	Where sheathing has completely weathered away, replace the sheathing in-kind.	1	EA	\$ 1,870.00	\$ 1,870.00	\$ 397.80	\$ 397.80	\$ -	\$ -	\$ 2,267.80	\$ 2,267.80	
	Subtotal - Direct Cost				\$ 2,301.00		\$ 1,042.80		\$ 5,270.00		\$ 8,613.80	
	Sales and Locality Tax	6	%						\$ 316.20		\$ 316.20	
	Subtotal										\$ 8,930.00	
	General Conditions	15	%								\$ 1,339.50	
	Subtotal										\$ 10,269.50	
	Contingency	30	%								\$ 3,080.85	
	Subtotal										\$ 13,350.35	
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)										\$ 13,400.00	\$ 17,707.27

**Summary:**

The Workshop is an Ordinary Hazard Storage Occupancy structure with metal siding and roofing supported by a pre-engineered metal framing system over a slab-on-grade foundation. The only point of entry is a very large sliding door at the front of the building. The current use of the building is sawdust storage.

The exact designer/manufacturer of the pre-engineered building is unknown. The structure consists of a series of repetitive single-span moment frames that span over the central work area. These frames act as the main gravity system and form the primary north/south lateral system. Cable cross-braces between adjacent frames resist lateral loads in the east/west direction. The metal frames support the roof structure above, which consists of steel channel purlins and a corrugated metal roof deck. The upper walls consist of corrugated metal sheathing fastened to pre-engineered steel spandrel beams and wind girts. Below these walls, the steel frames bear on a concrete wall that ties into the slab-on-grade.

Water service was supplied to an outdoor spigot. Additionally, a small shed abuts the west side of the building which consists of simple wood framing and wood roof trusses that support a corrugated metal roof. This addition is not included in our report.

Life Safety:

L 3.1 **Observation:** The Equipment Storage building contains a fire extinguisher that has no maintenance tags and appears to be past its useful life. Storage occupancies require a fire extinguisher per (NFPA 1, 13.6.1.2).
Recommendations: Provide a new fire extinguisher in a conspicuous location that is readily accessible. Locate fire extinguisher on a fixed surface.

L 3.2 **Observation:** Common Path of travel is approximately 135 ft. NFPA 101 table 42.2.5 (as amended by Montgomery County) allows a common path of travel of up to 75 ft.
Recommendations: Provide an additional exit on the back end of the building to eliminate the common path of travel.

L 3.3 **Observation:** Only one means of egress is provided for the building. Per NFPA 101, section 42.2.4.1, the number of means of egress in ordinary hazard storage occupancies is permitted to be one, as long as the exit can be reached within the common path of travel distance, which it cannot.
Recommendations: Provide an additional exit on the back end of the building to eliminate the common path of travel.

Life Safety References:

- NFPA 101
- Group U (IBC)



L 3 – Workshop Building

Structural:

S 3.1 **Observation:** At some locations on the exterior, we observed rusted panels. Openings in wall sheathing can lead to water infiltration and are often focal points for further deterioration. Current locations where rust is present will likely degrade further as time passes. At other locations we observed large and small holes in the corrugated metal siding, likely caused by weathering and corrosion.

Recommendation: At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal. Where sheathing has completely weathered away, replace the sheathing in-kind.

S 3.2 **Observation:** We observed damaged sections of gutter in some locations. Gutters are both dented or corroded depending on the location.

Recommendation: Replace gutters where damaged such that rainwater is channeled as designed.

S 3.3 **Observation:** We observed minor surface rust at many locations, likely due to the structure's general exposure to atmospheric moisture and expected decay of surface primer over its service life.

Recommendation: Grind rusted steel until bare metal is exposed and apply a rust-inhibitive coating. If during this process members are discovered to be significantly corroded, take corrective action such as repairing, reinforcing, or replacing the members in question.



S 3.1a – Exterior view of Workshop entrance, on the west side of the building.



S 3.1b – Interior view of Workshop, looking south. Note holes in wall panels.



S 3.2 – Exterior view of Workshop north elevation.
Note corroded gutters where indicated.



S 3.3a – Interior view of Workshop, looking east.



S 3.3b – Interior view of Workshop, looking west.



S 3.3c – Interior view of Workshop, looking north.



G – Entrance Door. Water Service Spigot.

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Workshop												
L3.1	New Fire Extinguisher	1	LS									\$ 261.69
	Provide a new fire extinguisher in a conspicuous location that is readily accessible.	1	LS	\$ 125.00	\$ 125.00	\$ 50.00	\$ 50.00		\$ -	\$ 175.00	\$ 175.00	
L3.2	Means of egress	1	EA									\$ 6,864.53
	Provide an additional exit on the back end of the building to eliminate the common path of travel.	1	EA	\$ 3,175.00	\$ 3,175.00	\$ 1,415.50	\$ 1,415.50	\$ -	\$ -	\$ 4,590.50	\$ 4,590.50	
L3.3	Means of egress	1	LS									see pricing on L3.2
	Provide an additional exit on the back end of the building to eliminate the common path of travel.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
S3.1	Metal wall sheathing	1	LS									\$ 78,236.07
	At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal.	1	LS	\$ 5,832.00	\$ 5,832.00	\$ 3,265.00	\$ 3,265.00	\$ -	\$ -	\$ 9,097.00	\$ 9,097.00	
	Where sheathing has completely weathered away, replace the sheathing in-kind.	1	LS	\$ 35,640.00	\$ 35,640.00	\$ 7,581.60	\$ 7,581.60	\$ -	\$ -	\$ 43,221.60	\$ 43,221.60	
S3.2	Gutter	1	LS									\$ 1,801.63
	Replace gutters where damaged such that rainwater is channeled as designed.	1	LS	\$ 426.00	\$ 426.00	\$ 778.80	\$ 778.80	\$ -	\$ -	\$ 1,204.80	\$ 1,204.80	
S3.3	Interior Metal panels	1	LS									\$ 78,236.07
	Grind rusted steel until bare metal is exposed and apply a rust-inhibitive coating.	1	LS	\$ 5,832.00	\$ 5,832.00	\$ 3,265.00	\$ 3,265.00	\$ -	\$ -	\$ 9,097.00	\$ 9,097.00	
	If during this process members are discovered to be significantly corroded, take corrective action such as repairing, reinforcing, or replacing the members in question.	1	LS	\$ 35,640.00	\$ 35,640.00	\$ 7,581.60	\$ 7,581.60	\$ -	\$ -	\$ 43,221.60	\$ 43,221.60	
	Subtotal - Direct Cost				\$ 86,670.00		\$ 23,937.50		\$ -		\$ 110,607.50	
	Sales and Locality Tax	6	%						\$ -		\$ -	
	Subtotal											\$ 110,607.50
	General Conditions	15	%									\$ 16,591.13
	Subtotal											\$ 127,198.63
	Contingency	30	%									\$ 38,159.59
	Subtotal											\$ 165,358.21
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)											\$ 165,400.00
												\$ 165,400.00

**Summary:**

Top Barn is a two-story, wood framed, unconditioned agricultural structure with metal siding and roofing. The ground level contains horse stables while the second story is unoccupied and used for miscellaneous storage such as hay but, at the time of this visit, did not appear to be in use. There are two exits via sliding doors on either side of the building. The only way to access the second story is by wooden ladders in two locations near the center of the building. Top Barn is equipped with electrical lighting. And water service to an outdoor spigot.

The lower level consists of a north/south corridor which supports dimensional lumber joists of the second floor above that span across the stalls and across the central corridor. These joists transfer load into spandrel beams, posts, and wood framed stud walls, and are braced by wood x-braces top and bottom at two points along their spans. At the upper level, the exterior perimeter walls support a series of roof trusses that clear span the entire upper-level space. Trusses bear on spandrel beams and are also connected to them with hurricane ties, which help to prevent the trusses from experiencing uplift detachment during wind events. The walls are finished with corrugated metal wall sheathing, and the roof is finished with a corrugated metal roof deck.

Life Safety:

L 4.1 Observation: The Top Barn has 2 sliding/barn door style exit doors. Both doors only partially opened and required excessive force to open. The opening distance and force required to open the doors is partially due to the age of the doors and the vegetation that developed on the sides of the doors.

Recommendations: Remove the vegetation from the sides of the doors to ensure that the doors can fully open with reasonable force.

L 4.2 Observation: The Top Barn has storage present in the means of egress walkway.

Recommendation: Move storage from within the Top Barn to a dedicated storage room or to another building dedicated for storage.

L 4.3 Observation: The Top Barn has an uneven walking surface due to dips in the concrete floor.

Recommendation: level the concrete floor so that walking surface is level and free from dips in accordance with NFPA 101 Section 7.1.6.

Note: While NFPA 101 is a code written for human safety, it references NFPA 150 which is a code written for animal safety. The state of Maryland does not enforce the use of NFPA 150, however the guidance provided in NFPA 150 is relevant to this facility and should be considered when describing the life safety aspects of the building.

L 4.4 NFPA 150 Recommendation: If means of egress is intended for animal relocation, provide a minimum clear width of approximately 2.5 times the width of the largest animal (a horse) (NFPA 150, 12.2.2)

- **Note:** Currently, the doors do not open wide enough to meet this requirement (without excess force).

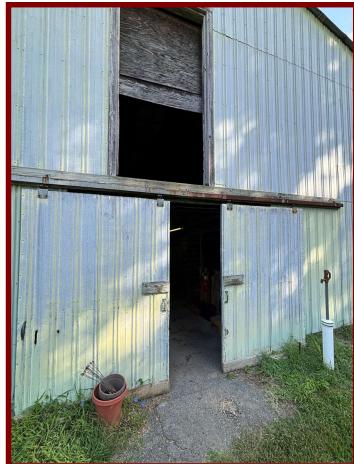
L 4.5 NFPA 150 Recommendation: In horse facilities with sleeping quarters, provide an automatic fire alarm system which activates an alarm signal and reports to a central monitoring station upon activation of a manual pull station, automatic sprinkler system flow switch, or any required detection system (i.e. smoke detector, heat detector, etc.)

L 4.6 NFPA 150 Recommendation: In horse facilities with sleeping quarters, provide an automatic sprinkler system.

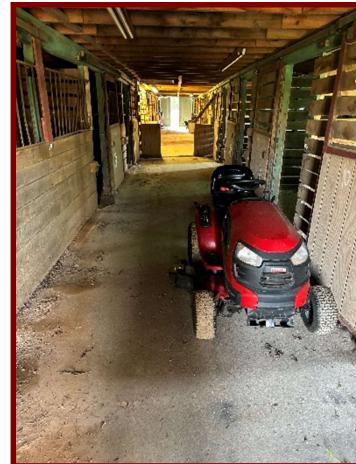
- **Note:** Horses are not capable of leaving or otherwise reacting to a fire hazard. Sprinklers offer an effective means of containing the fire until responders can arrive to escort the horses out of the building.

Life Safety References:

- NFPA 101
- S-1 (IBC)



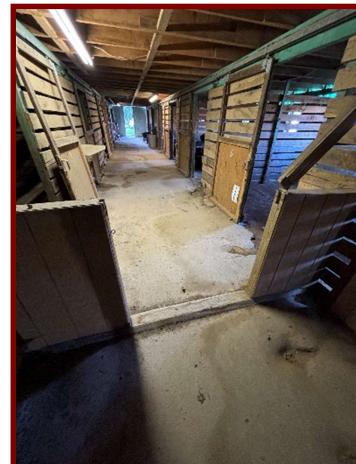
L 4.1 – Vegetaion growing on Sides of Sliding Doors



L 4.2 – Storage Within Egress Path



L 4.3a – Uneven Walking Surface



L 4.3b – Uneven Walking Surface

Structural:

S 4.1 **Observation:** Water exposure has resulted in some wood sheathing decay. Exposure to water and moisture will accelerate the decay of other wood members at this level, including structural elements.
Recommendation: Investigate wood elements at the ground level for signs of decay, and water damage. Replace damaged members in kind with pressure-treated lumber. Mitigate exposure to water per the other recommendations in this section.

S 4.2 **Observation:** Wall sheathing at the second story does not continue all the way to the roof decking, hence there is a continuous area that allows rainwater into the upper level. Additionally, some sections of the roof decking are detached from the base roof structure, giving another route for wind-driven rain and water infiltration. This observation also suggests other areas of roof decking may lack proper fastening to the roof structure, which risks loss of roof decking sections during future high wind events.
Recommendation: Evaluate condition of roof decking panels. If existing decking is in suitable condition, resecure to base building structure with new fastening hardware. If roof decking is found to be damaged and not suitable for further use, replace with new decking and provide suitable fastening to the base building structure.

S 4.3 **Observation:** A square section of the wooden deck at the second story has been removed. The surrounding area, and other areas of the second-story deck, show signs of water damage
Recommendation: This condition represents a fall hazard, and we recommend immediate action. Replace the removed and damaged sections of plywood sheathing in kind. Ensure replacement material is pressure-treated or otherwise waterproofed. Continue to leave the storage area unused until these repairs are made.

S 4.4 **Observation:** Metal wall sheathing on the east and west sides of the building are discolored and beginning to rust in some locations. Wall sheathing in these locations is not properly isolated from the surrounding grade and is directly exposed to water during rain events. The grade at some sections of the building exterior is not sloped to shed rainwater away from the building.
Recommendation: Where sheathing is undamaged or not significantly compromised, clean the sheathing down to bare metal and apply a rust-inhibitive coating. Where sheathing is significantly rusted or fully decayed, replace sheathing in kind. Isolate metal sheathing from soil and regrade the exterior so that water drains away from the building properly.



S 4.1 – Top Barn loft wall and roof framing. Note hurricane ties installed between trusses and spandrel beams.



S 4.2 – Top Barn roof framing and decking. Note locations in roof where decking has come loose and sunlight is visible.



S 4.3 – Collapsed decking at top barn loft.



S 4.4 – Exterior view of Top Barn east elevation.
Note condition of siding at grade.



Typical framing at stall. Note joists are braced at their tops and bottoms. A similar condition exists in other stalls.



Interior of stall. Note condition of plywood at and above grade. Typical condition.



Exterior view of Top Barn, facing northeast.



Interior view of Top Barn at ground level, facing north.

General Conditions:

G 4.1 **Observation:** The barn siding finish was observed to be damaged and deteriorated.

Recommendation: Repair and repaint the barn siding.

G 4.2 **Observation:** The electrical outlets were observed to be significantly deteriorated.

Recommendation: Replace outlets and switches as necessary.



G 4.1a – Barn siding.



G 4.1b – Barn siding.



G 4.1c – Barn siding.



G 4.2 – Electrical outlets and switches.

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Top Barn												
L4.1	Sliding/Barn Doors	1	LS									\$ 233.33
	Remove the vegetation from the sides of the doors to ensure that the doors can fully open with reasonable force.	1	LS	\$ -	\$ -	\$ 150.00	\$ 150.00	\$ -	\$ -	\$ 150.00	\$ 150.00	
L4.2	Means of Egress	1	EA									\$ 77.78
	Move storage from within the Top Barn to a dedicated storage room or to another building dedicated for storage.	1	EA	\$ -	\$ -	\$ 50.00	\$ 50.00	\$ -	\$ -	\$ 50.00	\$ 50.00	
L4.3	Concrete Floor repairs	1	LS									\$ 13,375.69
	Level the concrete floor so that walking surface is level and free from dips in accordance with NFPA 101 Section 7.1.6.	1	LS	\$ 811.20	\$ 811.20	\$ 5,759.52	\$ 5,759.52	\$ 2,028.00	\$ 2,028.00	\$ 8,598.72	\$ 8,598.72	
L4.4	Means of egress	1	LS									See L4.1 for pricing
	Note: Currently, the doors do not open wide enough to meet this requirement (without excess force).	1	LS		\$ -			\$ -	\$ -	\$ -	\$ -	
L4.5	Automatic Fire Alarm System	1	LS									\$ 18,927.86
	Provide automatic fire alarm system	1	LS	\$ 8,112.00	\$ 8,112.00	\$ 4,056.00	\$ 4,056.00	\$ -	\$ -	\$ 12,168.00	\$ 12,168.00	
L4.6	Automatic Sprinkler System	1	LS									\$ 31,546.43
	Note: Horses are not capable of leaving or otherwise reacting to a fire hazard. Sprinklers offer an effective means of containing the fire until responders can arrive to escort the horses out of the building.	1	LS	\$ 12,168.00	\$ 12,168.00	\$ 8,112.00	\$ 8,112.00	\$ -	\$ -	\$ 20,280.00	\$ 20,280.00	
S4.1	Water exposure has resulted in some wood sheathing decay. Exposure to water and moisture will accelerate the decay of other wood members at this level, including structural elements.	1	LS									Priced by others
S4.2	Wall and Roof repairs	1	LS									\$ 4,710.19
	Evaluate condition of roof decking panels.	1	LS	\$ -	\$ -	\$ 1,000.00	\$ 1,000.00	\$ -	\$ -	\$ 1,000.00	\$ 1,000.00	
	If existing decking is in suitable condition, resecure to base building structure with new fastening hardware.	1	LS	\$ -	\$ -	\$ 2,028.00	\$ 2,028.00	\$ -	\$ -	\$ 2,028.00	\$ 2,028.00	
S4.2	Roofing repairs	1	LS									\$ 30,600.04
Alternate	If roof decking is found to be damaged and not suitable for further use, replace with new decking and provide suitable fastening to the base building structure.	1	LS	\$ 15,615.60	\$ 15,615.60	\$ 4,056.00	\$ 4,056.00	\$ -	\$ -	\$ 19,671.60	\$ 19,671.60	
S4.3	Wooden deck	1	LS									\$ 917.54
	Replace the removed and damaged sections of plywood sheathing in kind.	1	LS	\$ 388.51	\$ 388.51	\$ 201.34	\$ 201.34	\$ -	\$ -	\$ 589.85	\$ 589.85	

S4.4	Metal wall sheathing	1	LS										\$ 60,038.08
	Where sheathing is undamaged or not significantly compromised, clean the sheathing down to bare metal and apply a rust-inhibitive coating.	1	LS	\$ 3,744.00	\$ 3,744.00	\$ 2,105.00	\$ 2,105.00	\$ -	\$ -	\$ 5,849.00	\$ 5,849.00		
	Where sheathing is significantly rusted or fully decayed, replace sheathing in kind.	1	LS	\$ 22,880.00	\$ 22,880.00	\$ 4,867.20	\$ 4,867.20	\$ -	\$ -	\$ 27,747.20	\$ 27,747.20		
	Isolate metal sheathing from soil and regrade the exterior so that water drains away from the building properly.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00		
G4.1	The barn siding finish was observed to be damaged and deteriorated.	1	LS										\$ 25,884.25
	Repair and repaint the barn siding.	1	LS	\$ 7,987.20	\$ 7,987.20	\$ 8,652.80	\$ 8,652.80	\$ -	\$ -	\$ 16,640.00	\$ 16,640.00		
G4.2	The electrical outlets were observed to be significantly deteriorated.	1	LS										\$ 8,088.83
	Replace outlets and switches as necessary.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 5,200.00	\$ 5,200.00	\$ 5,200.00	\$ 5,200.00		
	Subtotal - Direct Cost				\$ 71,706.51		\$ 41,037.86		\$ 12,228.00		\$ 124,972.37		
	Sales and Locality Tax	6	%		\$ 4,302.39				\$ 733.68		\$ 5,036.07		
	Subtotal										\$ 130,008.44		
	General Conditions	15	%								\$ 19,501.27		
	Subtotal										\$ 149,509.71		
	Contingency	30	%								\$ 44,852.91		
	Subtotal										\$ 194,362.62		
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)										\$ 194,400.00	\$ 194,400.00	

**Summary:**

Dormitory Two is a two-story Lodging or Rooming House. It has six sleeping rooms on each level. The ground level has four entry points while two sets of exterior stairs, one on each side of the building, provide access to the second level. Dormitory Two is equipped with a partial fire sprinkler system throughout each room of the first floor, the hallway of the first floor, and the hallway of the second floor. The building is also equipped with single station smoke alarms within all of the rooms and alarm bells at one of the two side exits on both floors. The attic is inaccessible.

Each level contains separate sleeping, kitchen, bathroom, and dining room areas. The areas are stacked. The bathrooms include two shower stalls and two toilet rooms on each floor. The kitchens contained propane stoves.

The building is connected to the County water and sewer systems. There is a mechanical space on the ground level with an exterior door located on the east side of the building. The space includes separate air handlers for the first and second floors, water meter, electric water heater, electrical panel, and fire alarm system control panel. Carrier heat pump condensers were observed on the exterior.

The structure consists of exterior CMU walls and wood floors, with structural timber girders supported by steel columns. Metal stairs are present at the east and west gable ends of the building, which provide access from the exterior to the second story.

Life Safety:

L 5.1 **Observation:** The fire alarm transformer appears corroded, possibly beyond useful life, and may not be currently functional. There were no tags present to indicate the date of the last fire alarm test or maintenance.

Recommendations: The existing fire alarm system should be replaced with a new fire alarm system. The new Fire Alarm Control Unit (FACU) should be located within a NEMA 4x (weatherproof) enclosure due to the ambient conditions of the utility room where the existing FACU is located. The new fire alarm system should be designed to the applicable requirements of the Lodging or Rooming House chapter of NFPA 101 (NFPA 101, 26.3.4), which requires the following:

- Provide manual pull stations within 60 inches of each exit doorway.
- Provide low frequency smoke alarms within each sleeping room.
- Provide smoke alarms within the living area.
- Provide a heat detector within the room containing the FACU (Heat detector used due to ambient conditions of space).
- Provide carbon monoxide detectors outside of each separate sleeping area in the immediate vicinity of the rooms (can be combo smoke/CO alarm).
- Activation of manual pull station or activation of sprinkler system should activate the alarm for the full building (both levels).
- Where fire alarm systems are provided, they should be provided per NFPA 72 and provided with a means of reporting back to a constantly attended receiving station (NFPA 101, 13.3.4.3). The receiving station can be a constantly attended location within the building, on the premises, or a direct-dialing to the local fire department.

L 5.2 **Observation:** The Dormitory Two building is equipped with an automatic sprinkler system within rooms on the first floor, the kitchen area, and at both ends of the hallway on each level. Sprinkler protection is not sufficient to cover the entire hallway and sprinkler protection does not exist within second floor sleeping rooms.

Recommendation: Extend the sprinkler system to include sprinkler protection within the entire hallway on both levels and within each sleeping room. Sprinkler system should comply with the requirements of NFPA 13D, which only omits coverage in bathrooms less than 55 ft² and in closets and pantries that do not exceed 24 ft² and are of a non-combustible material (NFPA 13D, 8.3).

Note: The sprinkler system should activate an alarm on the fire alarm system upon waterflow.

L 5.3 **Observation:** Fire alarm bell is halfway through ceiling.

Recommendation: Provide new notification appliances within Dormitory Two building per comment L 5.1 above.

L 5.4 **Observation:** Storage present in front of exit doors throughout.

Recommendation: Move storage out of exit path to provide egress path that is minimum 28 inches in width (NFPA 101, 7.3.4.1.2) and clear from obstructions and tripping hazards (NFPA 101, 7.1.10.1).

L 5.5 **Observation:** Exterior stairs contain combustible storage underneath.
Recommendations: Remove storage from underneath exterior exit stairs.

L 5.6 **Observation:** A secondary means of escape is required within the Dormitory Two building. Windows with direct access to the exterior with minimum 5.7 ft² clear opening area, located not more than 20 ft above grade are permissible secondary means of escape (NFPA 101, 26.2.1.2, 24.2.2). Windows used as a secondary means of escape must be operable from the inside without the use of any special tools, keys, or special effort.
Recommendations: Windows do not appear to meet the requirements of a secondary means of egress. Provide new windows that meet the requirements.

L 5.7 **Observation:** Exterior exit stair has one stair on the roof, at a sloping angle that is greater than the allowed $\frac{1}{4}$ inch per foot (NFPA 101, 7.2.2.3.4).
Recommendations: Provide stair that is level with the ground at a slope of no more than $\frac{1}{4}$ inch per foot (NFPA 101, 7.2.2.3.4)

L 5.8 **Observation:** Fire extinguisher on first floor is mounted behind the sink without signage to indicate its location.
Recommendations: Provide sign indicating the location of the fire extinguisher (NFPA 10, 6.1.3.3).

L 5.9 **Observation:** Egress lighting is removed from wall.
Recommendation: Provide new egress lighting in same location as previous.

L 5.10 **Observation:** Sleeping rooms are required to be separated by smoke partitions. To create a smoke partition, sleeping room doors are required to be self-closing or automatic closing (NFPA 101, 26.3.5).
Recommendation: Provide sprinklers throughout the building in accordance with NFPA 13D as recommended in comment L 5.2 (NFPA 101, 7.2.1.3.5).

L 5.11 **Observation:** Multiple exits have immediate steps down at the door discharge. In existing buildings, floor level outside of the door opening is permitted to be one step lower than inside, but no more than 8 inches.
Recommendation: Raise floor level at exit discharge so that exit discharge level is no more than 8 inches below floor level inside for a distance equal to the door leaf (Door width, approximately 36 inches) (NFPA 101, 7.2.1.3.5, 7.2.1.3.2). Recommendation is to provide concrete or wood/deck landing outside of each exit at the same level as the inside floor. Where multiple steps are required to reach the ground, provide a handrail.

L 5.12 **Recommendation:** Test emergency lighting Monthly.

Life Safety References:

- NFPA 101
- R-2 (IBC)
- **Note:** The classification of “Lodging or Rooming House” in accordance with NFPA 101 assumes that the building houses 16 people or fewer (NFPA 101, 26.1.1.1).



L 5.1 – Fire Alarm Control Unit



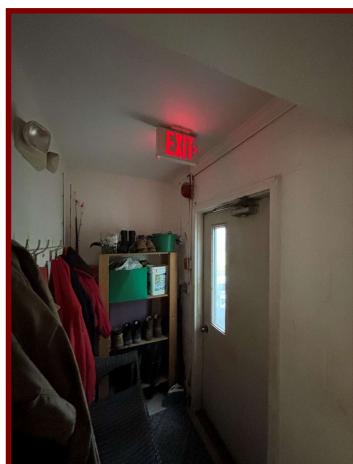
L 5.2a – Sprinkler at End of Hallway



L 5.2b – Sprinkler Within Room



L 5.3 – Fire Alarm Bell Through Ceiling



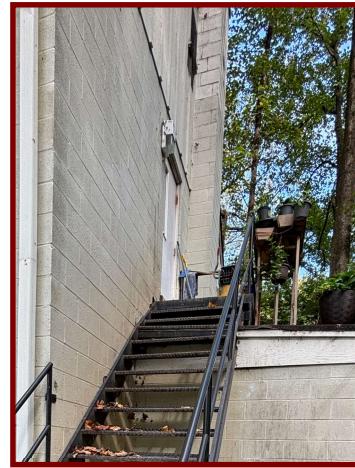
L 5.4 – Storage at Exit Door



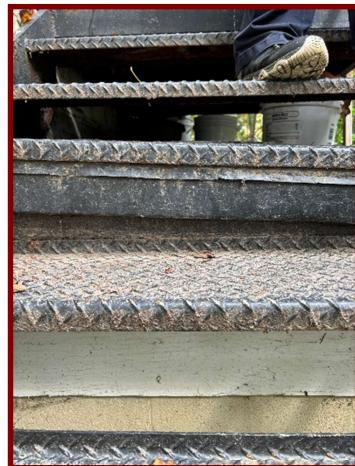
L 5.5 – Storage Underneath Exterior Stair



L 5.6 – Secondary Means of Escape



L 5.7a – Sloped Exterior Stair



L 5.7b – Sloped Exterior Stair



L 5.9 – Missing Egress Light



L 5.10 – Unsprinklered Corridor



L 5.11 – Steps at Exit Discharge

Structural:

S 5.1 **Observation:** Ceiling tiles near the west entrance of the building are discolored, indicating moisture or water in the ceiling above.
Recommendation: Investigate the building enclosure and MEP equipment within the ceiling space for sources of water damage. Evaluate the base building structure in the vicinity of the water staining for possible damage. If found, take steps to mitigate the offending condition.

S 5.2 **Observation:** The upper landing of the exterior metal-framed stair present at the east gable end of the building incorporates steel spandrel beam framing, which pockets into the adjacent exterior CMU wall construction. We did not observe supplemental flashing or other means of waterproofing or enclosure protection to prevent moisture from infiltrating into the CMU wall construction at this location. The steel beam element within the pocket also appears rusted.
Recommendation: Patch hole in masonry wall once stair is removed per recommendations in section D.

S 5.3 **Observation:** Installation detailing of the exterior metal-framed stair present at the east gable end of the building has resulted in the stair stringers potentially bearing on the exterior wall construction of the mechanical space. We are uncertain if the wall of the mechanical room is suitable to structurally support the vertical load superimposed by the metal-framed stair stringer above.
Recommendation: The stairs appear to not be code compliant, and we recommend replacing the existing stair with new engineered stairs. New stairs should be oriented to avoid interacting with the room structure. This will require new foundations at base of the stairs and new framing at the top of the stairs.

S 5.4 **Observation:** We observed hairline step cracks in CMU mortar joints at the building exterior. CMU is stained and discolored in some locations.
Recommendation: Cut out and repoint damaged mortar joints. Use a mortar suitable for exterior CMU. If desired, clean and repaint discolored CMU with a paint suitable for exterior CMU.

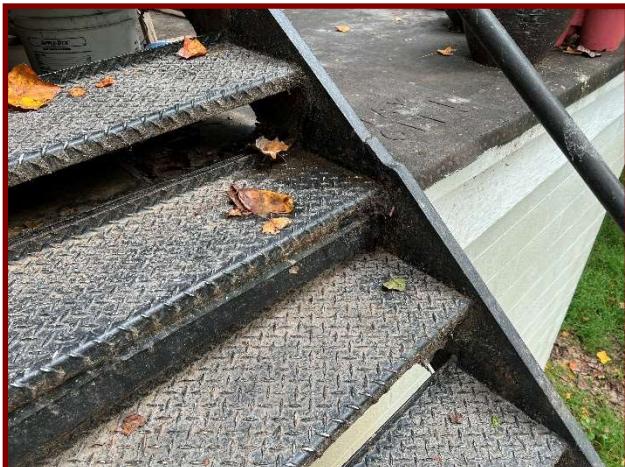
S 5.5 **Observation:** A strip footing is exposed at the northeast side of the building, raising concern that the footing may not project to frost depth, which is 2'-6" in Montgomery County. Inadequate frost depth may cause structural distress, building settlement, and cracking in exterior CMU wall construction.
Recommendation: We recommend conducting a test pit to confirm depth of the existing footings. If footings are above frost depth, we recommend backfilling and compacting soil around the building to protect footings from frost heave.



S 5.1 – Moisture damage at interior ceiling near west entrance.



S 5.2 – Stairs at east side of building. Note bearing pocket in exterior CMU wall.



S 5.3a – Stair tread bearing on low roof at east side of building.



S 5.3b – Stair stringer bearing on low roof at east side of building.



S 5.4 – Step cracks in CMU at south side of building.



S 5.5 – Exposed footing at northeast side of building.



Dormitory Two west elevation.



Dormitory Two south elevation.
Note discoloration of brick at base of wall.

General Conditions:

G 5.1 **Observation:** Downspouts from the roof gutters do not extend far enough from the building foundation to prevent erosion and possible damage to the foundation.
Recommendation: Extend downspouts to direct water away from the foundation.

G 5.2 **Observation:** The exterior walls were discolored near grade. This appears to be possibly due to water overflowing the gutters during heavy rains. This could occur due to clogged gutters or inadequately sized gutters.
Recommendation: Investigate the gutter size requirement based upon the roof size and slope. Perform periodic gutter cleaning, especially during the fall when leaves are falling from the trees. Clean and repaint the exterior façade.

G 5.3 **Observation:** The windows were single-pane steel casement windows. The interior frames were significantly rusted, most likely occurring from condensation on the cold window frames during the winter months.
Recommendation: Replace the windows with energy-efficient windows.

G 5.4 **Observation:** The first-floor kitchen area was observed to be in need of cleaning and painting. The walls and cabinets were observed to be dirty and the cabinets had chipped paint.
Recommendation: Clean and repaint walls and cabinets of kitchen. Cabinet doors and drawers may need adjustments to close properly.

G 5.5 **Observation:** The shower stalls on the first floor were observed to be deteriorated. The threshold of one stall was completely deteriorated.
Recommendation: Replace the two shower stalls on the first floor.

G 5.6 **Observation:** A portion of the ceiling of one of the toilet rooms on the first floor was deteriorated, possibly due a toilet leak on the second floor.
Recommendation: Investigate toilet on second floor for leaks, replace damaged floor on second floor if present, and repair first floor ceiling damage.

G 5.7 **Observation:** The first-floor bathroom flooring was observed to be deteriorated and appeared to have been patched in areas during the past.
Recommendation: Remove and replace the vinyl tile flooring in the first-floor bathroom.

G 5.8 **Observation:** Separate systems condition the first and second floor spaces. Carrier condensing units were observed at the exterior of the mechanical space. One condenser was indicated to have been manufactured in July 1999 and the other February 1999. Both units are beyond their normal useful life of 15-20 years.
Recommendation: Replace the air conditioning systems.

G 5.9 **Observation:** A State 119-gallon water heater was observed to have been manufactured in March of 2011. The unit is nearing the end of its normal useful life of 8-12 years.
Recommendation: Replace the water heater since it most likely receives a lot of use due to the building occupancy type and a malfunction would inconvenience many tenants.



G 5.1 – Downspouts need extension.



G 5.2 – Discoloring near grade.



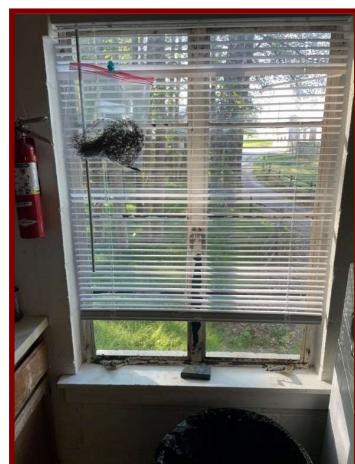
G 5.3a – Windows



G 5.3b – Windows / Exterior façade.



G 5.3c – Rusted Window Frames



G 5.3d – Rusted Window frames



G 5.4a – 1st Floor Kitchen



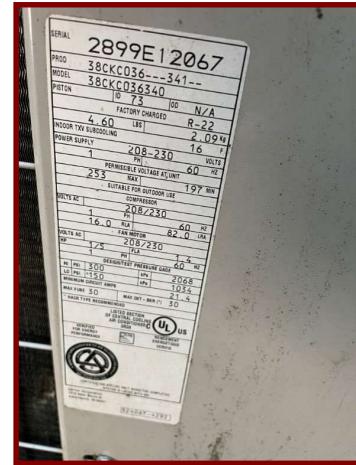
G 5.4b – 1st Floor Kitchen



G 5.5 – 1st Floor Shower Stall

G 5.6 – 1st Floor Bathroom ceiling.

G 5.8a – Exterior condensing units.



G 5.8b – Condensing unit tag.



G 5.8c – Condensing unit tag.



G 5.9a – Water heater



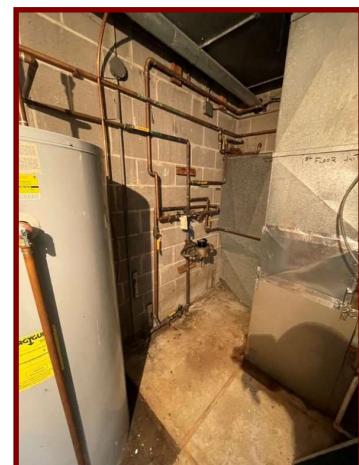
G 5.9b – Water heater tag



G 5.8d – AHU



G = Electrical panel



G – water heater and water meter

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Dormitory Two												
L5.1	Fire alarm system	1	LS									\$ 7,267.60
	The existing fire alarm system should be replaced with a new fire alarm system.	1	LS	\$ 1,862.00	\$ 1,862.00	\$ 2,793.00	\$ 2,793.00	\$ -	\$ -	\$ 4,655.00	\$ 4,655.00	
L5.2	Automatic Sprinkler System	1	LS									\$ 29,070.38
	Sprinkler protection is not sufficient to cover the entire hallway and sprinkler protection does not exist within second floor sleeping rooms.	1	LS	\$ 11,172.00	\$ 11,172.00	\$ 7,448.00	\$ 7,448.00	\$ -	\$ -	\$ 18,620.00	\$ 18,620.00	
L5.3	Fire alarm bell	1	LS									\$ -
	Provide new notification appliances within Dormitory Two building per comment 1 above.	1	LS					\$ -	\$ -	\$ -	\$ -	See pricing in L5.1
L5.4	Move storage	1	LS									\$ 156.12
	Move storage out of exit path to provide egress path that is minimum 28 inches in width (NFPA 101, 7.3.4.1.2) and clear from obstructions and tripping hazards (NFPA 101, 7.1.10.1).	1	LS		\$ -	\$ 100.00	\$ 100.00	\$ -	\$ -	\$ 100.00	\$ 100.00	
L5.5	Exterior stairs contain combustible storage underneath.	1	LS									\$ 234.19
	Remove storage from underneath exterior exit stairs.	1	LS		\$ -	\$ 150.00	\$ 150.00	\$ -	\$ -	\$ 150.00	\$ 150.00	
L5.6	Windows	1	LS									\$ 40,982.68
	Provide new windows that meet the requirements.	1	LS	\$ 23,375.00	\$ 23,375.00	\$ 2,875.00	\$ 2,875.00	\$ -	\$ -	\$ 26,250.00	\$ 26,250.00	
L5.7	Exterior roof stair	1	LS									\$ 647.53
	Provide stair that is level with the ground at a slope of no more than 1/4 inch per foot (NFPA 101, 7.2.2.3.4)	1	EA	\$ 335.00	\$ 335.00	\$ 74.50	\$ 74.50	\$ 5.25	\$ 5.25	\$ 414.75	\$ 414.75	
L5.8	Signage	1	LS									\$ 58.55
	Provide sign indicating the location of the fire extinguisher (NFPA 10, 6.1.3.3).	1	EA	\$ 25.00	\$ 25.00	\$ 12.50	\$ 12.50			\$ 37.50	\$ 37.50	
L5.9	Egress lighting is removed from wall.	1	LS									\$ 188.91
	Provide new egress lighting in same location as previous.	1	LS	\$ 51.00	\$ 51.00	\$ 70.00	\$ 70.00	\$ -	\$ -	\$ 121.00	\$ 121.00	
L5.10	Provide automatic sprinkler system	1	LS									See pricing in L5.1
L5.11	Door Exit Discharge	1	LS									\$ 793.63
	Provide concrete or wood/deck landing outside of each exit at the same level as the inside floor.	1	LS	\$ 111.11	\$ 111.11	\$ 47.22	\$ 47.22	\$ -	\$ -	\$ 158.33	\$ 158.33	
	Where multiple steps are required to reach the ground, provide a handrail.	1	LS	\$ 250.00	\$ 250.00	\$ 100.00	\$ 100.00	\$ -	\$ -	\$ 350.00	\$ 350.00	
L5.12	Test emergency lighting Monthly. (annual cost shown)	1	LS	\$ -	\$ -	\$ 600.00	\$ 600.00	\$ -	\$ -	\$ 600.00	\$ 600.00	
	Annual testing allowance	1	LS	\$ -	\$ -	\$ 600.00	\$ 600.00	\$ -	\$ -	\$ 600.00	\$ 600.00	

S5.1	Stained ceiling tiles	1	LS											Priced by others
S5.2	The upper landing of the exterior metal-framed stair present at the east gable end of the building is in poor condition. The stairs appear to be code compliant, but the treads are stained and worn. The railings are in good condition. The stairs are supported by a central metal post.	1	LS											\$ 195.16
	Patch hole in masonry wall once stair is removed per recommendations in section D.	1	LS	\$ 25.00	\$ 25.00	\$ 100.00	\$ 100.00	\$ -	\$ -	\$ 125.00	\$ 125.00			
S5.3	Exterior framed metal stairs	1	LS											\$ 37,965.58
	The stairs appear to not be code compliant, and we recommend replacing the existing stair with new engineered stairs.	1	LS	\$ 21,406.25	\$ 21,406.25	\$ 2,911.25	\$ 2,911.25	\$ -	\$ -	\$ 24,317.50	\$ 24,317.50			
S5.4	CMU repairs	1	LS											\$ 11,565.78
	Cut out and repoint damaged mortar joints.	1	LS	\$ 1,687.80	\$ 1,687.80	\$ 535.05	\$ 535.05	\$ -	\$ -	\$ 2,222.85	\$ 2,222.85			
	If desired, clean and repaint discolored CMU with a paint suitable for exterior CMU.	1	LS	\$ 1,148.40	\$ 1,148.40	\$ 4,036.80	\$ 4,036.80	\$ -	\$ -	\$ 5,185.20	\$ 5,185.20			
S5.5	Strip footings	1	LS											\$ 3,697.03
	We recommend conducting a test pit to confirm depth of the existing footings.	1	LS	\$ -	\$ -	\$ 140.00	\$ 140.00	\$ 140.00	\$ 140.00	\$ 280.00	\$ 280.00			
	If footings are above frost depth, we recommend backfilling and compacting soil around the building to protect footings from frost heave.	1	Allow	\$ -	\$ -	\$ 1,740.00	\$ 1,740.00	\$ 348.00	\$ 348.00	\$ 2,088.00	\$ 2,088.00			
G5.1	Downspouts	1	LS											\$ 251.05
	Extend downspouts to direct water away from the foundation.	1	LS	\$ 71.00	\$ 71.00	\$ 89.80	\$ 89.80	\$ -	\$ -	\$ 160.80	\$ 160.80			
G5.2	The exterior walls were discolored near grade. This appears to be possibly due to water overflowing the gutters during heavy rains. This could occur due to clogged gutters or inadequately sized gutters.	1	LS											\$ 11,303.41
	Perform periodic gutter cleaning, especially during the fall when leaves are falling from the trees. (annual costs at 2 times per year)	1	LS	\$ -	\$ -	\$ 280.00	\$ 280.00	\$ -	\$ -	\$ 280.00	\$ 280.00			
	Clean and repaint the exterior façade.	1	LS	\$ 3,340.80	\$ 3,340.80	\$ 3,619.20	\$ 3,619.20	\$ -	\$ -	\$ 6,960.00	\$ 6,960.00			
G5.3	Windows													see pricing on L5.6
	Replace the windows with energy-efficient windows.													
G5.4	Kitchen	1	LS											\$ 1,676.15
	Clean and repaint walls and cabinets of kitchen.	1	LS	\$ 316.80	\$ 316.80	\$ 556.80	\$ 556.80	\$ -	\$ -	\$ 873.60	\$ 873.60			
	Cabinet doors and drawers may need adjustments to close properly.	1	Allow	\$ -	\$ -	\$ 200.00	\$ 200.00	\$ -	\$ -	\$ 200.00	\$ 200.00			
G5.5	Shower stalls	2	EA											\$ 2,366.85
	Replace the two shower stalls on the first floor.	2	EA	\$ 570.00	\$ 1,140.00	\$ 188.00	\$ 376.00	\$ -	\$ -	\$ 758.00	\$ 1,516.00			
G5.6	Toilet Room Floor	1	LS											\$ 491.09
	Investigate toilet on second floor for leaks	1	LS	\$ -	\$ -	\$ 70.00	\$ 70.00	\$ -	\$ -	\$ 70.00	\$ 70.00			
	Replace damaged floor on second floor	1	LS	\$ 89.75	\$ 89.75	\$ 154.80	\$ 154.80	\$ -	\$ -	\$ 244.55	\$ 244.55			
	Repair first floor ceiling damage.	1	LS	\$ 25.00	\$ 25.00	\$ 50.00	\$ 50.00	\$ -	\$ -	\$ 75.00	\$ 75.00			
G5.7	Bathroom Floor	1	LS											\$ 746.28
	Remove and replace the vinyl tile flooring in the first-floor bathroom.	1	LS	\$ 278.00	\$ 278.00	\$ 200.00	\$ 200.00	\$ -	\$ -	\$ 478.00	\$ 478.00			

G5.8	Air conditioning system		1	LS									\$ 5,027.21
	Replace the air conditioning systems.		1	LS	\$ 2,350.00	\$ 2,350.00	\$ 870.00	\$ 870.00		\$ -	\$ 3,220.00	\$ 3,220.00	
G5.9	Water Heater		1	LS									\$ 4,006.15
	Replace the water heater since it most likely receives a lot of use due to the building occupancy type and a malfunction would inconvenience many tenants.		1	LS	\$ 2,325.00	\$ 2,325.00	\$ 241.00	\$ 241.00		\$ -	\$ 2,566.00	\$ 2,566.00	
	Subtotal - Direct Cost				\$ 61,448.56		\$ 21,993.32		\$ 145.25		\$ 83,587.13		
	Sales and Locality Tax		6	%		\$ 3,686.91			\$ 8.72		\$ 3,695.63		
	Subtotal										\$ 87,282.76		
	General Conditions		15	%							\$ 13,092.41		
	Subtotal										\$ 100,375.18		
	Contingency		30	%							\$ 30,112.55		
	Subtotal										\$ 130,487.73		
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)										\$ 130,500.00	\$ 159,628.07	

**Summary:**

Rear Barn is a two-story, wood framed, agricultural structure with metal roofing and both wood and metal siding. The barn has electrical and water service. The ground level is used for horse stables and the unoccupied second level is used for miscellaneous storage. There are also several locations to wash horses on the ground level. There is only one point of entry to the building. The only way to access the second story is by a door at the front of the building.

Large cylindrical wood posts nominally embedded some distance into the soil subgrade act as gravity and lateral support for wood joists and girders above the ground floor and wood trusses at roof level. The stalls are separated by wood siding and miscellaneous dimensional lumber frames. Wood headers and posts running east-west provide support for gravity loads and form stall entrances. There are single story additions on the north and east sides of the primary barn structure consisting of wood roof framing and wood posts. We were unable to observe the upper roof framing due to second level access restrictions.

Life Safety:

L 6.1 **Observation:** Egress from second floor of barn only accessible from front barn doors.

Recommendation: Provide ladder access from second level (NFPA 101, 7.2.9).

L 6.2 **Observation:** Fire Extinguisher is blocked when door is fully open.

Recommendation: Provide sign indicating the location of the fire extinguisher (NFPA 10, 6.1.3.3).

Note: While NFPA 101 is a code written for human safety, it references NFPA 150 which is a code written for animal safety. The state of Maryland does not enforce the use of NFPA 150, however the guidance provided in NFPA 150 is relevant to this facility and should be considered when describing the life safety aspects of the building.

L 6.3 **NFPA 150 Recommendation:** If means of egress is intended for animal relocation, provide a minimum clear width of approximately 2.5 times the width of the largest animal (a horse) (NFPA 150, 12.2.2)

- **Note:** This is already the case in the Rear Barn, however it is worth noting for future reference.

L 6.4 **NFPA 150 Recommendation:** In horse facilities with sleeping quarters, provide an automatic fire alarm system which activates an alarm signal and reports to a central monitoring station upon activation of a manual pull station, automatic sprinkler system flow switch, or any required detection system (ie. smoke detector, heat detector, etc.)

L 6.5 **NFPA 150 Recommendation:** In horse facilities with sleeping quarters, provide an automatic sprinkler system.

- **Note:** Horses are not capable of leaving or otherwise reacting to a fire hazard. Sprinklers offer an effective means of containing the fire until responders can arrive to escort the horses out of the building.

Life Safety References:

- NFPA 101
- Group U (IBC)



L 6.1 – Access to Second Level



L 6.2 – Fire Extinguisher Hidden

Structural:

S 6.1 **Observation:** At some locations in the structure we observed large and small holes in the corrugated metal siding, likely caused by weathering and corrosion. At other locations on the exterior we observed rusted panels. Openings in wall sheathing can lead to water infiltration and are often focal points for further deterioration. Current locations where rust is present will likely degrade further over time. At many locations metal siding has shifted and, in some cases, buckled. Shifted and buckled metal siding is indicative of building settlement and/or severe section loss of perimeter wood posts, as are some of our other observations.

Recommendation: At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal. Where sheathing has completely weathered away, replace the sheathing in-kind. Where sheathing has noticeably shifted and buckled, replace sheathing in-kind.

S 6.2 **Observation:** Many wooden members near and above grade are heavily degraded or show signs of degradation. Near grade, some members are heavily damaged by termites. Wood siding at the wash area has also deteriorated over time due to exposure to the elements, exposure to water during washing, and typical wear and tear.

Recommendation: Where possible, replace heavily damaged wood members or sister them with new pressure-treated lumber. Paint or otherwise moisture-protect exposed undamaged or lightly damaged exterior wood members. Replace and protect heavily deteriorated wood siding and ensure new siding is treated for water and moisture exposure. We also recommend conducting a test pit at 2 exterior wood columns to expose the below grade condition and determine how deep into the soil these columns are set. We recommend conducting a full building lateral analysis after completing the test pits to evaluate the lateral capacity of the structure.

S 6.3 **Observation:** Several of the large posts are decayed at their bases. These posts do not appear to be pressure-treated or otherwise waterproofed. It is unclear if wood posts are in good condition below grade.

Recommendation: Evaluate all wood posts for signs of decay above and below grade. Replace all decayed posts with new, pressure-treated posts to protect against future rot. Provide adequate concrete foundation support for new posts. This will require temporary shoring of the barn structure, excavation for new footings and piers, and installation of new footings and piers.

S 6.4 **Observation:** Some sections of wooden deck have decayed, resulting in voids.

Recommendation: This condition represents a falling hazard and we recommend immediate repair. Replaced damaged wooden decking in-kind and repair any damage to corrugated metal roof decking or siding that may allow water to enter the barn.

S 6.5 Observation: We noted crushing failure at the tops of several interior timber posts, associated with bearing of the timber beam framing supporting the second floor structure above. This may be indicative of either overloading of the timber posts due to storage loads placed on the second floor above, or past moisture damage and decay of the column top.

Recommendation: Performing repairs to interior posts noted earlier in this section will help to mitigate further settlement of the structure. Evaluate existing framing to determine if additional posts are required to reinforce the crushed posts.

S 6.6 Observation: Due to access constraints we were not able to observe upper roof framing above the loft. Given observations around rest of structure, we have concerns that similar levels of deterioration of wood framing and roof sheathing may be present.

Recommendation: We recommend investigating the roof framing to confirm existing conditions. This investigation may require temporary shoring to provide safe access to loft space.



S 6.1a – Exterior view of Rear Barn, taken facing southeast.



S 6.1b – Deteriorated corrugated metal siding on north side of building.



S 6.2a – Heavily degraded lumber at building exterior near grade.



S 6.2b – View of eave, window, and siding on east side of building.



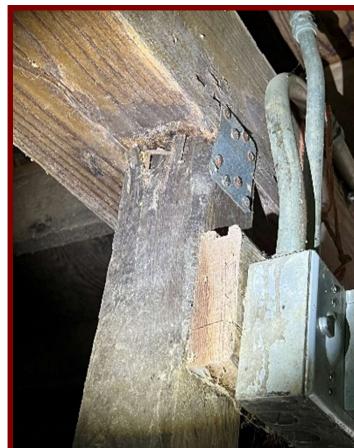
S 6.2c – Condition of exposed lumber at exterior near grade.



S 6.3 – Condition of structural post at interior. The below-grade condition of these posts is unclear.



S 6.4 – Interior framing and wooden deck above ground level.
Note rotted deck where shown.



S 6.5 – Crushed top of post.



Framing and metal roof deck at east side of building.

General Conditions:

G 6.1 **Observation:** The wood siding at the wash area has deteriorated significantly at the base.
Recommendation: Replace wood siding at wash area.

G 6.2 **Observation:** A outdoor spigot at the wash area was observed to be leaking and reported to need repair.
Recommendation: Replace the leaking outdoor spigot.

G 6.3 **Observation:** Significant areas of deteriorated metal and wood siding need to be replaced.
Recommendation: Repaint the exterior due to the extent of needed replacement of the siding.



G 6.1 – Wood siding deteriorating.



G 6.2 – Spigot leak.

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Rear Barn												
L6.1	Egress from second floor of barn only accessible from front barn doors.	1	LS									\$ 1,527.85
	Provide ladder access from second level (NFPA 101, 7.2.9).	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	
L6.2	Fire Extinguisher is blocked when door is fully open.	1	EA									\$ 57.29
	Provide sign indicating the location of the fire extinguisher (NFPA 10, 6.1.3.3).	1	EA	\$ 25.00	\$ 25.00	\$ 12.50	\$ 12.50		\$ -	\$ 37.50	\$ 37.50	
L6.3	If means of egress is intended for animal relocation, provide a minimum clear width of approximately 2.5 times the width of the largest animal (a horse) (NFPA 150, 12.2.2)	1	LS									No costs required
	Note: This is already the case in the Rear Barn, however it is worth noting for future reference.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
L6.4	In horse facilities with sleeping quarters, provide an automatic fire alarm system which activates an alarm signal and reports to a central monitoring station upon activation of a manual pull station,	1	LS									No costs required
	automatic sprinkler system flow switch, or any required detection system (ie. smoke detector, heat detector, etc.)	1	LS	\$ 10.45	\$ 10.45	\$ -	\$ -	\$ -	\$ 42.00	\$ 10.45	\$ 52.45	
L6.5	Automatic sprinkler system	1	LS									\$ 14,224.28
	Note: Horses are not capable of leaving or otherwise reacting to a fire hazard. Sprinklers offer an effective means of containing the fire until responders can arrive to escort the horses out of the building.	1	LS	\$ 5,586.00	\$ 5,586.00	\$ 3,724.00	\$ 3,724.00	\$ -	\$ -	\$ 9,310.00	\$ 9,310.00	
S6.1	Metal wall sheathing	1	LS									\$ 50,584.98
	At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal.	1	LS	\$ 3,132.00	\$ 3,132.00	\$ 1,765.00	\$ 1,765.00	\$ -	\$ -	\$ 4,897.00	\$ 4,897.00	
	Where sheathing has completely weathered away, replace the sheathing in-kind.	1	LS	\$ 19,140.00	\$ 19,140.00	\$ 4,071.60	\$ 4,071.60	\$ -	\$ -	\$ 23,211.60	\$ 23,211.60	
	Where sheathing has noticeably shifted and buckled, replace sheathing in-kind.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	
S6.2	Wood siding repairs	1	LS									\$ 68,081.00
	Where possible, replace heavily damaged wood members or sister them with new pressure-treated lumber.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	\$ 25,000.00	
	Paint or otherwise moisture-protect exposed undamaged or lightly damaged exterior wood members.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	
	Replace and protect heavily deteriorated wood siding and ensure new siding is treated for water and moisture exposure.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00	
	We also recommend conducting a test pit at 2 exterior wood columns to expose the below grade condition and determine how deep into the soil these columns are set.	1	LS	\$ -	\$ -	\$ 280.00	\$ 280.00	\$ 280.00	\$ 280.00	\$ 560.00	\$ 560.00	
	We recommend conducting a full building lateral analysis after completing the test pits to evaluate the lateral capacity of the structure.	1	LS	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00	

S6.3	Wood post repairs	1	LS										\$ 29,029.15
	Evaluate all wood posts for signs of decay above and below grade.	1	Allow	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00		
	Replace all decayed posts with new, pressure-treated posts to protect against future rot, Including new footings and piers	1	Allow	\$ -	\$ -	\$ 15,000.00	\$ 15,000.00	\$ -	\$ -	\$ 15,000.00	\$ 15,000.00		
S6.4	Wood deck repairs	1	LS										\$ 14,224.28
	Replace damaged wooden decking in-kind and repair any damage to corrugated metal roof decking or siding that may allow water to enter the barn.	1	LS	\$ 5,586.00	\$ 5,586.00	\$ 3,724.00	\$ 3,724.00	\$ -	\$ -	\$ 9,310.00	\$ 9,310.00		
S6.5	Timber posts	1	LS										See pricing S6.3
	Performing repairs to interior posts noted earlier in this section will help to mitigate further settlement of the structure.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
	Evaluate existing framing to determine if additional posts are required to reinforce the crushed posts.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
S6.6	Roof framing	1	LS										Priced by others
	We recommend investigating the roof framing to confirm existing conditions.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
	This investigation may require temporary shoring to provide safe access to loft space.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -		
G6.1	Wood siding (wash area)	1	LS										\$ 7,935.65
	Replace wood siding at wash area.	1	LS	\$ 4,410.00	\$ 4,410.00	\$ 784.00	\$ 784.00	\$ -	\$ -	\$ 5,194.00	\$ 5,194.00		
G6.2	Outdoor spigot		Ea.										\$ 221.54
	Replace the leaking outdoor spigot.	1	Ea.	\$ 75.00	\$ 75.00	\$ 70.00	\$ 70.00	\$ -	\$ -	\$ 145.00	\$ 145.00		
G6.3	Exterior painting	1	LS										\$ 10,633.84
	Repaint the exterior due to the extent of needed replacement of the siding.	1	LS	\$ 3,340.80	\$ 3,340.80	\$ 3,619.20	\$ 3,619.20	\$ -	\$ -	\$ 6,960.00	\$ 6,960.00		
	Subtotal - Direct Cost				\$ 41,305.25		\$ 41,050.30		\$ 46,322.00		\$ 128,677.55		
	Sales and Locality Tax	6	%							\$ 2,779.32		\$ 2,779.32	
	Subtotal											\$ 131,456.87	
	General Conditions	15	%									\$ 19,718.53	
	Subtotal											\$ 151,175.40	
	Contingency	30	%									\$ 45,352.62	
	Subtotal											\$ 196,528.02	
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)											\$ 196,600.00	\$ 196,519.86

**Summary:**

Main Barn is a one-story structure with a large riding arena in the center, and two mezzanines, one for hay storage and the other for office space. It is the largest structure in the complex and consists of steel and wood framing around the main riding area and an exclusively wood-framed extension at the horse stall and hay loft areas. Main barn is classified as a non-separated mixed-use Assembly, Storage, and Business occupancy. The perimeter of the building is bordered by horse stables and large walkways. There are four entry points via large sliding barn style doors on each corner of the building and one standard swinging door entry point with a vestibule at the front. Each mezzanine has two sets of stairs leading to them. The building has a partial fire alarm system, consisting of a bell and a manual pull station at each exit. It also contains a partial fire sprinkler system only in the mezzanine level office area.

Two single-occupancy restrooms and a water fountain are located near the pedestrian entrance vestibule. A room adjacent to the restrooms contained an electric water heater and laundry equipment. The mezzanine office areas are conditioned by water baseboard heating and three window AC units.

An asphalt parking area is located at the entrance on the west side of the building. A previously paved area at the rear of the barn (east side) was observed to be deteriorated. A concrete ramp with a concrete retaining wall was located at the northeast corner of the building. This ramp is reportedly used to remove "muck" from the stall areas.

Within the riding area, the roof is supported by a system of long span steel trusses that support solid sawn wood rafters and corrugated metal roof decking. At the perimeter of the riding area, steel wide-flange columns support the long-span steel trusses and cylindrical wood posts support perpendicular wood joists orthogonal to the trusses. Pairs of wood spandrel beams transfer loads from joists into the posts. These posts and associated braces carry both gravity and lateral loads, with the embedment of the wood posts in the ground acting to resist lateral forces. Within the arena, cable cross-braces transfer lateral loads into the steel columns.

The typical floor structure in the stall and hay loft areas consists of solid sawn wood girders that support solid sawn wood rafters and corrugated metal roof decking. The interior wood posts have diagonal braces in the same direction of girders. Typical exterior walls consist of corrugated metal sheathing supported by wooden wind girts that are connected to the posts. Along the south façade, a section of the building consists of CMU with a wood and corrugated metal finish.

Life Safety:

L 7.1 **Observation:** Hay stacked on mezzanine inhibits the egress path from the storage mezzanine. This egress path is required for limiting the travel distance for the mezzanine to less than 200 ft (NFPA 101, 42.2.6) as well as for ensuring that 2 means of egress exist from the mezzanine level (NFPA 101, 7.4.1.1(2)).
Recommendation: Rearrange hay storage so that egress paths have at least a 28-inch clear width (NFPA 101, 7.14.3.4).

L 7.2 **Observation:** The exits on all corners of the building have gates that can be locked to restrict egress movement as well as chains across the doors that restrict egress.
Recommendation: Remove lockable gates and chains restricting egress so that exit doors can be opened readily from the egress side whenever building is occupied (NFPA 101, 7.2.1.5.1).

L 7.3 **Observation:** The Main Barn is equipped with a fire alarm system consisting of bell/strobe devices and manual pull stations at each exit as well as heat detection in walking areas.

- The fire alarm system is a Cerberus Pyrotronics SXL-ES conventional fire alarm system, which is still in production from Siemens (who now owns Cerberus Pyrotronics) but is in the process of being phased out.
- The fire alarm system is only partial coverage.
- The Fire Alarm Control Unit (FACU) is located in an unconditioned area (subject to outside temperature and humidity conditions) without being provided within a NEMA 4x enclosure (Weatherproof Enclosure)

Recommendations: A fire alarm system is not required by code; however, the following are recommended for the existing fire alarm system:

- Fire alarm systems are required where the number of occupants in the building can be greater than 300, including any parties, field trips, shows, etc. (NFPA 101, 13.3.4.1.1)
- Where fire alarm systems are provided, they should be provided per NFPA 72 and provided with a means of reporting back to a constantly attended receiving station (NFPA 101, 13.3.4.3). The receiving station can be a constantly attended location within the building, on the premises, or a direct-dialing to the local fire department.
- (See note 6 for further discussion of fire alarm system)
- (See note L 7.8 for NFPA 150 discussion on fire alarm systems within horse facilities)

L 7.4 **Observation:** The Main Barn is equipped with a wet-pipe automatic sprinkler system in the office portion of the building only. The sprinkler system is all copper pipe, connected to domestic water.

Recommendation: A fire sprinkler system is not required by code, however the following are recommendations for the fire sprinkler system:

- If sprinkler protection is provided within the building, it is recommended to be provided for the entire building.
- The sprinkler system should activate an alarm on the fire alarm system upon waterflow.
- (See note L 7.9 for NFPA 150 discussion on fire sprinkler systems within horse facilities)
- At minimum, leave the fire sprinkler system in place and continue to perform the required maintenance and testing on the system.

L 7.5 **Observation:** Exit doors blocked with bags, which creates a tripping hazard in the egress path.
Recommendation: Remove bags in front of exit doors to remove the tripping hazard.

L 7.6 **Observation:** The Main Barn fire alarm system did not appear to be in good condition upon visual inspection. None of the fire alarm devices throughout the building appeared to be NEMA 4x (Weatherproof) rated but were located adjacent to open doors and provided within an unconditioned space. While a testing tag was present on the system, it was out of date and did not indicate what was tested. Upon visual inspection of the heat detectors, rust and corrosion was present on the heat sensing element and many heat detectors do not appear to all be in good working order. Based on visual inspection of the manual pull stations, it does not appear that the manual pull stations have been tested and may also not be in working condition.
Recommendations: Remove existing fire alarm system and provide new fire alarm system designed to NFPA 72, with NEMA 4x devices throughout, and with notification devices located throughout occupied spaces.

- Initiating devices (heat detectors and pull stations) should be tested during the regular fire alarm test.

Note: While NFPA 101 is a code written for human safety, it references NFPA 150 which is a code written for animal safety. The state of Maryland does not enforce the use of NFPA 150, however the guidance provided in NFPA 150 is relevant to this facility and should be considered when describing the life safety aspects of the building.

L 7.7 **NFPA 150 Recommendation:** If means of egress is intended for animal relocation, provide a minimum clear width of approximately 2.5 times the width of the largest animal (a horse) (NFPA 150, 12.2.2)

- **Note:** This is already the case in the Main Barn, however it is worth noting for reference.

L 7.8 **NFPA 150 Recommendation:** In horse facilities greater than 5,000 ft², provide an automatic fire alarm system which activates an alarm signal and reports to a central monitoring station upon activation of a manual pull station, automatic sprinkler system flow switch, or any required detection system (ie. smoke detector, heat detector, etc.)

- **Note:** The existing fire alarm system lacks occupant notification, specifically within the middle of the building and the offices. A “Positive Alarm Sequence” could be provided to activate an alarm at designated locations for a certain amount of time to allow a responder to confirm the fire prior to the general alarm signal (NFPA 150, 9.4.4).

L 7.9 **NFPA 150 Recommendation:** In horse facilities greater than 5,000 ft², provide an automatic sprinkler system.

- **Note:** Horses are not capable of leaving or otherwise reacting to a fire hazard. Sprinklers offer an effective means of containing the fire until responders can arrive to escort the horses out of the building.
- **Note:** This building is not conditioned and would require a dry-pipe sprinkler system. Dry-pipe sprinkler systems only fill with water when a sprinkler head activates. The system remains “dry” to eliminate the concern of freezing pipe. Due to the amount of moving parts in a dry-pipe sprinkler system and the effects of corrosion as water mixes with air in the pipes, dry-pipe sprinkler systems are harder to maintain than wet-pipe sprinkler systems.

Life Safety References:

- NFPA 101
- Groups A-4, S-1, and B (IBC)



L 7.1 – Inadequate Clear Width in Egress Path



L 7.2 – Exit Door with Chain



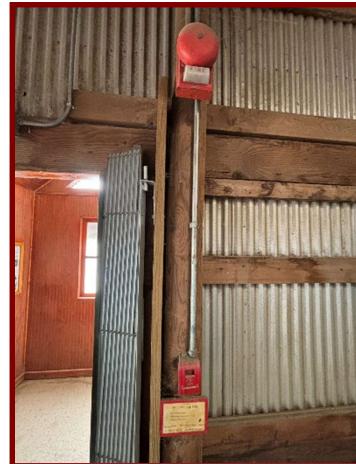
L 7.3 – Fire Alarm Control Unit (FACU)



L 7.4 – Sprinklers on Ceiling In Office



L 7.5 – Egress Door with Tripping Hazard



L 7.6a – Fire Alarm Devices



L 7.6b – Heat Detector Rust/Corrosion

Structural:

S 7.1 **Observation:** Corroded exterior metal panels. Corrosion is not widespread.

Recommendation: At areas with limited to no section loss, clean the sheathing down to bare metal and apply a corrosion-inhibitive coating compatible with the base metal. If sheathing is discovered to have significant section loss, replace the sheathing in-kind.

S 7.2 **Observation:** Damage and decay at the base of the perimeter walls with wood cladding.

Recommendation: Remove damaged wall sheathing and replace with new pressure-treated sheathing. During this process, evaluate wall framing in the area for signs of decay and replace framing members as required.

S 7.3 **Observation:** We directly observed several wooden posts that were fully decayed at their bases along the front of the building. This condition has compromised their axial and lateral stability.

At most of the posts we surveyed along the front of the building, we were able to easily advance a screwdriver into the base of the wood post, indicating that the posts have experienced significant decay below grade. Although this condition appeared to be concentrated at the front of the building, there are many posts that we were not able to investigate during the site visit. Slabs on grade are also deteriorated at these locations. There are also sandbags along the front of the building suggesting a continual source of water that likely contributed to the post decay.

Recommendation: This condition poses a serious life safety risk to building occupants. The widespread condition along the front of the building puts the entrance at risk of collapse. We recommend immediately shoring this section of the building to prevent collapse and protect the building occupants. Following installation of the temporary shoring, we recommend executing a full evaluation of all post elements to search for signs of decay. Decayed wooden posts or posts that have settled excessively shall be removed and replaced with new wooden posts. Specialized shoring to support the building and façade during post replacement will be required. New posts shall be pressure-treated to mitigate future decay. Embed new posts in concrete to provide foundation support for gravity and lateral loads. New posts shall be designed by a licensed structural engineer. We also recommend engaging a geotechnical engineer to determine the capacity and properties of the existing soil. We also recommend engaging an architect to modify the façade to prevent further water intrusion into the building.

S 7.4 **Observation:** Braces, attached towards the top of the vertical wood posts, may act to transfer lateral loads from the roof structure to the ground. An appreciable number of diagonal braces are broken, and others are cracked. Additionally, some vertical brace members, which connect the diagonal members to the column, have shifted horizontally, indicating the connection may not be sound. On account of these observations, it is unclear if the braces and lateral system are adequately designed to code standards.

Recommendation: The deteriorated braces and broken braces may pose a life safety risk to building occupants. We recommend immediately engaging a structural engineer to analyze the structure and determine the demand on and capacity of the braces and lateral system, as well as a geotechnical engineer to determine the capacity and properties of the existing soil. Analysis should Repair and reinforce the existing system as necessary.

S 7.5 **Observation:** The railing along the hay loft at the north side of the riding area, easily accessible via a nearby stairway, is in poor condition, with entire sections detached from their supports. Regardless of the condition, it is unlikely the railing meets current code.

Recommendation: Remove the degraded railing and install a code-compliant system. Alternatively, repair and reinforce the existing railing to achieve code compliance.

S 7.6 **Observation:** Sloped rafters above the stable area are notched at bases to accommodate other wood framing members. Notching the members has significantly reduced the section of the member and reduced the capacity of the system. We observed a cracked notched member at one location.

Recommendation: Engage an engineer to analyze the structure and determine the demand on and capacity of the notched rafters. Sister notched rafters as required.



S 7.1a – Exterior view of Main Barn, looking northwest.



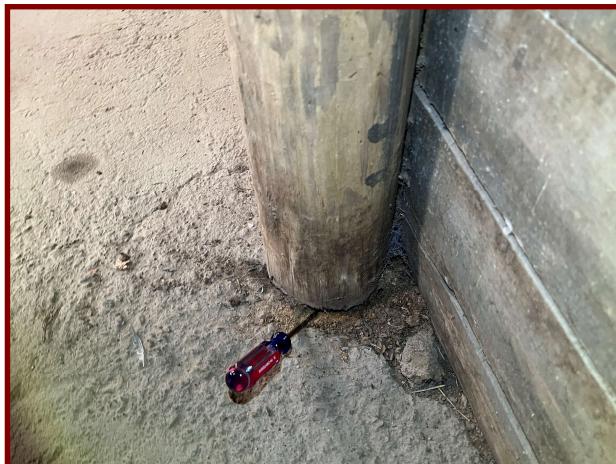
S 7.1b – South side of Main Barn, looking northeast.



S 7.2 – East side of Main Barn, looking southwest.



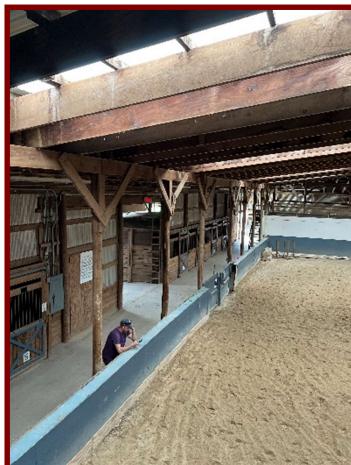
S 7.3a – Typical exterior post condition.



S 7.3b – Post base. Significant deterioration at grade.



S 7.4a – Broken brace on east side of riding area.



S 7.4b – View of joists, beams, posts, and braces at east side of riding area, looking south.



S 7.4c – Laterally shifted vertical member. These members connect the braces to the post.



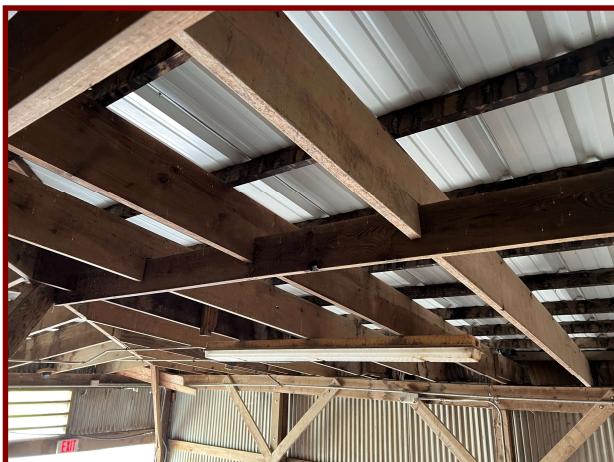
S 7.4d – Separated braces and broken vertical brace member. The break pattern suggests these members carry lateral loads.



S 7.4e – Termite damage in brace at west side of riding area.



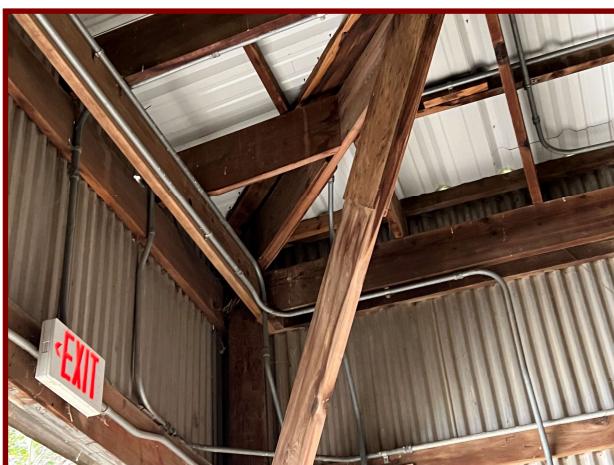
S 7.5 – View of hay loft at northeast side of riding area. Note poor condition of metal railing and associated members.



S 7.6a – View of multiple notched beams.



S 7.6b – Close view of notched beam.



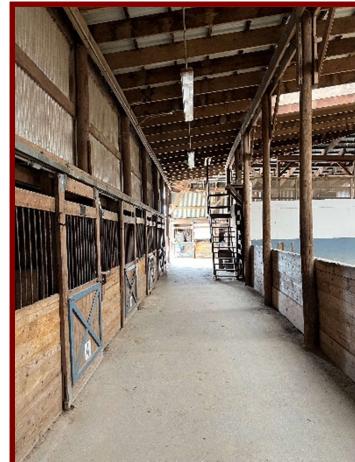
Corner reinforced with a large brace.



View of typical steel framing above riding area.



Main barn framing directly inside east entrance.



Main barn framing on east side of riding area.



View of hay loft at south side of building. Note closely spaced framing below the loft.

General Conditions:

G 7.1 **Observation:** The front (west side) of the building experiences water infiltration during heavy rains from the parking lot runoff. The entrances are blocked with sandbags and asphalt curbs to attempt to mitigate the infiltration. The bags and curbs are impediments to entry and pose tripping hazards.
Recommendation: Re-grade, re-pave, and re-stripe the parking lot to direct runoff to appropriate drainage areas. Provide two ADA compliant accessible parking spaces and access aisles. Repave the rear paved area and replace deteriorated concrete of ramp area.

G 7.2 **Observation:** The restrooms and drinking fountain are not ADA compliant and the existing fixtures are degraded. Since the restrooms and drinking fountain are for public use, they should meet ADA requirements.
Recommendation: Reconstruct the hallway and the largest restroom to provide a compliant entry with the required maneuvering clearance on the pull side of the door (exterior), with accessible toilet, lavatory, and accessories. Provide an ADA compliant drinking fountain. Space may need to be taken from the adjacent laundry room to accomplish this.

G 7.3 **Observation:** An 80-gallon electric water heater (US/Craftsman Water Heater Company) was observed in the laundry room. It was manufactured in December 2005 and appears to be beyond its normal useful life of 8-12 years.
Recommendation: Replace the water heater.

G 7.4 **Observation:** The three air conditioning units for the mezzanine space appeared to be old. It was indicated to us one may have been replaced five years ago.
Recommendation: Investigate the age of the air conditioning units and replace as necessary.



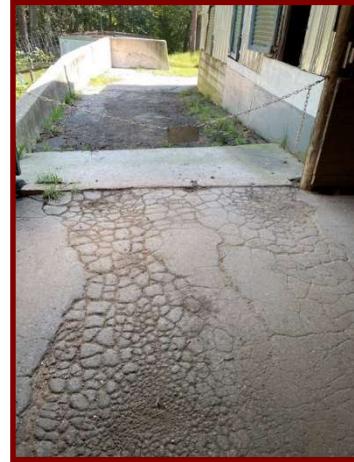
G 7.1a – Parking Lot



G 7.1b – Parking Lot



G 7.1c – Parking Lot



G 7.1a – Rear paved area



G 7.2a – Restrooms and Drinking Fountain



G 7.2b – Restrooms and Drinking Fountain



G 7.2c – Larger Restroom



G 7.2d – Larger Restroom



G 7.3 – Laundry Equipment



G 7.4 – Window units at office mezzanine.

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Main Barn												
L7.1	Hay Storage	1	LS									\$ 311.22
	Rearrange hay storage so that egress paths have at least a 28-inch clear width (NFPA 101, 7.14.3.4).	1	LS	\$ -	\$ -	\$ 200.00	\$ 200.00	\$ -	\$ -	\$ 200.00	\$ 200.00	
L7.2	Lockable gates	1	EA									\$ 622.44
	Remove lockable gates and chains restricting egress so that exit doors can be opened readily from the egress side whenever building is occupied (NFPA 101, 7.2.1.5.1).	1	EA		\$ -	\$ 400.00	\$ 400.00	\$ -	\$ -	\$ 400.00	\$ 400.00	
L7.4	Automatic Sprinkler System	1	LS									\$ 215,999.24
	If sprinkler protection is provided within the building, it is recommended to be provided for the entire building. (tie in to existing system)	1	LS	\$ 69,404.00	\$ 69,404.00	\$ 69,404.00	\$ 69,404.00	\$ -	\$ -	\$ 138,808.00	\$ 138,808.00	
L7.5	Tripping Hazard	1	Ea.									\$ 23.34
	Remove bags in front of exit doors to remove the tripping hazard.	1	Ea.	\$ -	\$ -	\$ 15.00	\$ 15.00	\$ -	\$ -	\$ 15.00	\$ 15.00	
L7.6	Fire alarm system	1	LS									\$ 80,999.72
	Remove existing fire alarm system and provide new fire alarm system designed to NFPA 72, with NEMA 4x devices throughout, and with notification devices located throughout occupied spaces.	1	LS	\$ 34,702.00	\$ 34,702.00	\$ 17,351.00	\$ 17,351.00		\$ -	\$ 52,053.00	\$ 52,053.00	
L7.7	If means of egress is intended for animal relocation, provide a minimum clear width of approximately 2.5 times the width of the largest animal (a horse) (NFPA 150, 12.2.2)	1	LS									No costs required
	This is already the case in the Main Barn, however it is worth noting for reference.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
L7.8	Automatic fire alarm system	1	LS									See L7.6 for costs
	The existing fire alarm system lacks occupant notification, specifically within the middle of the building and the offices. A “Positive Alarm Sequence” could be provided to activate an alarm at designated locations for a certain amount of time to allow a responder to confirm the fire prior to the general alarm signal (NFPA 150, 9.4.4).	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
L7.9	Automatic sprinkler system	1	LS									\$ 28,974.60
	This building is not conditioned and would require a dry-pipe sprinkler system. Dry- pipe sprinkler systems only fill with water when a sprinkler head activates. The system remains “dry” to eliminate the concern of freezing pipe. Due to the amount of moving parts in a dry-pipe sprinkler system and the effects of corrosion as water mixes with air in the pipes, dry-pipe sprinkler systems are harder to maintain than wet-pipe sprinkler systems.	1	LS	\$ 11,172.00	\$ 11,172.00	\$ 7,448.00	\$ 7,448.00	\$ -	\$ -	\$ 18,620.00	\$ 18,620.00	
S7.1	Exterior metal panels	1	LS									\$ 206,990.35
	At areas with limited to no section loss, clean the sheathing down to bare metal and apply a corrosion-inhibitive coating compatible with the base metal.	1	LS	\$ 14,832.00	\$ 14,832.00	\$ 8,265.00	\$ 8,265.00	\$ -	\$ -	\$ 23,097.00	\$ 23,097.00	
	If sheathing is discovered to have significant section loss, replace the sheathing in-kind.	1	LS	\$ 90,640.00	\$ 90,640.00	\$ 19,281.60	\$ 19,281.60	\$ -	\$ -	\$ 109,921.60	\$ 109,921.60	
S7.2	Damage and decay at the base of the perimeter walls with wood cladding.	1	LS									Costs included in S7.1
	Remove damaged wall sheathing and replace with new pressure-treated sheathing. During this process, evaluate wall framing in the area for signs of decay and replace framing members as required.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

S7.3	We directly observed several wooden posts that were fully decayed at their bases along the front of the building. This condition has compromised their axial and lateral stability. Atmost of the posts we surveyed along the front of the building, we were able to easily advance a screwdriver into the base of the wood post, indicating that the postshave experienced significant decay below grade. Although this condition appeared to be concentrated at the front of the building, there are many posts that we were not able to investigate during the site visit. Slabs on grade are also deteriorated at these locations. There are also sandbags along the front of the building suggesting a continual source of water that likely contributed to the post decay.	LS												Pricing by others
	We recommend immediately shoring this section of the building to prevent collapse and protect the building occupants.													
	Following installation of the temporary shoring, we recommend executing a full evaluation of all post elements to search for signs of decay.													
	Decayed wooden posts or posts that have settled excessively shall be removed and replaced with new wooden posts.													
S7.4	Bracing	1	LS											\$ 6,224.40
	The deteriorated braces and broken braces may pose a life safety risk to building occupants. We recommend immediately engaging a structural engineer to analyze the structure and determine the demand on and capacity of the braces and lateral system, as well as a geotechnical engineer to determine the capacity and properties of the existing soil. Analysis should Repair and reinforce the existing system as necessary.	1	LS	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00			
S7.5	Railings	1	LS											\$ 212,254.68
	Remove the degraded railing and install a code-compliant system. Alternatively, repair and reinforce the existing railing to achieve code compliance.	1	LS	\$ -	\$ -		\$ -	\$ -	\$ -	\$ -	\$ -			
S7.6	Sloped rafters	1	LS											\$ 54,912.66
	Engage an engineer to analyze the structure and determine the demand on and capacity of the notched rafters.	1	LS	\$ -	\$ -	\$ 1,000.00	\$ 1,000.00	\$ -	\$ -	\$ 1,000.00	\$ 1,000.00			
	Sister notched rafters as required.	1	Allow	\$ 24,491.88	\$ 24,491.88	\$ 9,796.75	\$ 9,796.75	\$ -	\$ -	\$ 34,288.63	\$ 34,288.63			
G7.1	Parking lot	1	LS											\$ 142,289.86
	Re-grade, re-pave, and re-stripe the parking lot to direct runoff to appropriate drainage areas.	1	LS	\$ 56,070.00	\$ 56,070.00	\$ 12,810.00	\$ 12,810.00	\$ 11,130.00	\$ 11,130.00	\$ 80,010.00	\$ 80,010.00			
	Re-pave the rear paved area and replace deteriorated concrete of ramp area.	1	LS	\$ 8,010.00	\$ 8,010.00	\$ 1,830.00	\$ 1,830.00	\$ 1,590.00	\$ 1,590.00	\$ 11,430.00	\$ 11,430.00			
G7.2	Restrooms/Drinking Fountains	1	LS											\$ 9,506.22
	Reconstruct the hallway and the largest restroom to provide a compliant entry (proper maneuvering clearance on the pull side of the door), with accessible toilet, lavatory, and accessories.	1	LS	\$ 2,300.00	\$ 2,300.00	\$ 2,700.00	\$ 2,700.00	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00			
	Provide an ADA compliant drinking fountain.	1	EA	\$ 965.00	\$ 965.00	\$ 144.00	\$ 144.00	\$ -	\$ -	\$ 1,109.00	\$ 1,109.00			
G7.3	Water Heater	1	EA											\$ 2,660.93
	Replace the water heater.	1	EA	\$ 1,325.00	\$ 1,325.00	\$ 385.00	\$ 385.00	\$ -	\$ -	\$ 1,710.00	\$ 1,710.00			
G7.4	Air conditioning units	3	EA											\$ 2,885.01
	Investigate the age of the air conditioning units and replace as necessary.	3	EA	\$ 540.00	\$ 1,620.00	\$ 78.00	\$ 234.00	\$ -	\$ -	\$ 618.00	\$ 1,854.00			
	Subtotal - Direct Cost					\$ 315,531.88		\$ 155,264.35		\$ 12,720.00		\$ 483,516.23		
	Sales and Locality Tax	6	%			\$ 18,931.91				\$ 763.20		\$ 19,695.11		
	Subtotal											\$ 503,211.34		
	General Conditions	15	%									\$ 75,481.70		
	Subtotal											\$ 578,693.04		
	Contingency	30	%									\$ 173,607.91		
	Subtotal											\$ 752,300.95		
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)											\$ 752,400.00	\$ 964,654.68	

**Summary:**

The Large Arena is a single-story pre-engineered metal framed indoor riding and Assembly area with metal roofing and siding. It has one entry point in the form of a large sliding door capable of allowing pass-through for people, horses, machinery, etc. Ceiling-mounted light fixtures were observed in the arena and fluorescent light fixtures were observed in the suspended ceiling of the east addition. The east addition contained electric baseboard heaters. Some of the interior electrical fixtures of the east addition appeared to be connected with wires not enclosed in conduit.

The structure is composed of eight large, long-span moment frames spanning the width of the structure, which act as the main gravity system and north/south lateral system. Excepting the frames themselves, the roof structure consists of steel channel purlins and a roof deck made of corrugated metal roof decking. Vertical cross-braces along the north/south walls resist east/west lateral loads. The walls consist of corrugated metal sheathing fastened to spandrel beams. Each frame is supported by a large concrete foundation several feet above the finished grade.

There is an addition on the east side of the building consisting of CMU walls, wood roof joists, and a concrete slab on grade. This CMU addition has three entry points and appears to be used for assembly and viewing activities within the arena.

Life Safety:

L 8.1 **Observation:** The Large Arena has three exit doors, but two of them are permanently closed or blocked and unable to be opened. NFPA 101 requires that two exits be provided for assembly occupancies with less than 600 occupants (NFPA 101, 13.2.4).
Recommendations: Allow for both currently locked egress doors to be opened in order to provide a second remote means of egress.

L 8.2 **Observation:** Egress paths for the Large Arena are not well maintained. The path to the exit door (that does not open currently) in the back corner of the building is blocked by miscellaneous items constantly throughout the path. Additionally, the egress path is very uneven and narrow.
Recommendations: Provide egress path that is minimum 28 inches in width (NFPA 101, 7.3.4.1.2), clear from obstructions and tripping hazards (NFPA 101, 7.1.10.1), and with a level surface (NFPA 101, 7.1.6).

L 8.3 **Observation:** Fire extinguisher is located behind a column that obstructs visibility of the extinguisher. Fire extinguisher is not marked with a sign to point out its location.
Recommendations: Provide sign indicating the location of the fire extinguisher (NFPA 10, 6.1.3.3).

L 8.4 **Observation:** Storage shed attached to building is deteriorating, including the floorboards immediately touching the exit.
Recommendations: Replace and repair floors and siding of the shed or demolish the shed.

Life Safety References:

- NFPA 101
- Group A-4 (IBC)



L 8.1a – Permanently Closed Egress Door



L 8.1b – Blocked and Unusable Egress Door



L 8.2 – Uneven Walking Surface



L 8.3 – Blocked Fire Extinguisher



L 8.4 – Deteriorating Floor Boards

Structural:

S 8.1 **Observation:** We observed rusted panels at the building exterior. Openings in wall sheathing can lead to water infiltration and are often focal points for further deterioration. Current locations where rust is present will likely degrade further as time passes.
Recommendation: At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal. If sheathing has completely weathered away, replace the sheathing in-kind.

S 8.2 **Observation:** We observed minor surface rust at many locations, likely due to the structure's general exposure to atmospheric moisture and expected decay of surface primer over its service life. Small sections, such as the roof purlins, are especially susceptible to rust.
Recommendation: Grind rusted steel until bare metal is exposed and apply a rust-inhibitive coating. If during this process members are discovered to be significantly corroded, take corrective action such as repairing, reinforcing, or replacing the member in question.

S 8.3 **Observation:** Where the east addition meets the east end of the building, roof joists from the side addition were constructed to bear on the wind girts of the main building, with no observed supplemental reinforcement of the wind girts. It is unlikely the girts and the columns they connect to were designed to take the load from the east addition, and therefore may not have adequate reserve capacity to support the additional loads superimposed by the roof framing of the east addition.
Recommendation: Engage an engineer to analyze the area tributary to where the roof joists from the side building bear. Reinforce or retrofit the structure as necessary. This will likely consist of installing new steel beams to reinforce the existing wind girts, installing new cross bracing to increase lateral capacity of building to brace the east addition, and local column reinforcing to increase vertical capacity.

S 8.4 **Observation:** CMU walls in the east addition are cracked in multiple locations in both the interior and exterior. Cracking may be caused by building settlement or other subsurface action.
Recommendation: Investigate the foundations and subsurface conditions around the east addition. Provide adequate drainage in the area surrounding the addition to mitigate potential soil consolidation. Repair cracks in CMU walls to prevent further deterioration of these areas. Install crack monitors to determine if movement is continuing or has stopped.



S 8.1a – Exterior view of Large Indoor Riding Arena, taken facing west.



S 8.1b – Interior view of Large Indoor Riding Arena, same side as preceding photo.



S 8.2 – Interior view of Large Indoor Riding Arena. Note small purlins where indicated.



S 8.3 – East corner of Large Indoor Riding Arena. Note where roof joists from side building bear on wind girts.



S 8.4a – Interior of side building, facing northwest towards the Large Indoor Riding Arena.



S 8.4b – Cracked CMU in east addition.

General Conditions:

G 8.1 **Observation:** The exterior coating of siding of the building was deteriorated. Green translucent panels of the exterior façade allowed light into the building. The panels were observed to be dirty on the inside and outside.

Recommendation: Repaint exterior siding and clean the translucent panels on the inside and outside.

G 8.2 **Observation:** The paint on the walls of the east addition was observed to be deteriorated.

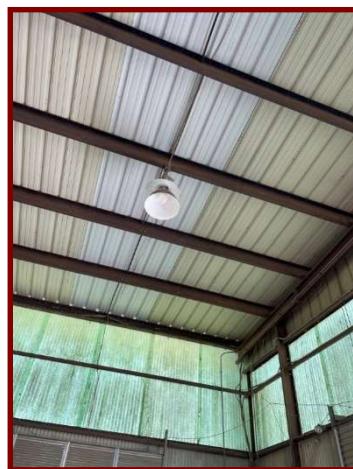
Recommendation: Repaint interior of east addition.

G 8.3 **Observation:** Electrical fixtures of the east addition appeared to be connected by surface-mounted wires.

Recommendation: Install conduit for electrical wires to surface-mounted fixtures.



G 8.1a – Deteriorating exterior façade.



G 8.1b – Translucent panels.



G 8.1c – Deteriorating exterior façade.



S 8.3 – Paint and install conduit for surface mounted wiring.

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Large Arena												
L8.1	Egress doors	1	LS									No costs required
	Allow for both currently locked egress doors to be opened in order to provide a second remote means of egress.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
L8.2	Egress Path	1	LS									\$ 1,725.93
	Provide egress path that is minimum 28 inches in width (NFPA 101, 7.3.4.1.2), clear from obstructions and tripping hazards (NFPA 101, 7.1.10.1), and with a level surface (NFPA 101, 7.1.6).	1	LS	\$ 85.20	\$ 85.20	\$ 804.92	\$ 804.92	\$ 213.00	\$ 213.00	\$ 1,103.12	\$ 1,103.12	
L8.3	Fire Extinguisher sign	1	LS									\$ 58.67
	Provide sign indicating the location of the fire extinguisher (NFPA 10, 6.1.3.3).	1	LS	\$ 25.00	\$ 25.00	\$ 12.50	\$ 12.50	\$ -	\$ -	\$ 37.50	\$ 37.50	
L8.4	Storage shed attached to building is deteriorating, including the floorboards immediately touching the exit.	1	LS									\$ 2,687.97
	Replace and repair floors and siding of the shed or demolish the shed.	1	LS	\$ 568.00	\$ 568.00	\$ 1,150.00	\$ 1,150.00	\$ -	\$ -	\$ 1,718.00	\$ 1,718.00	
S8.1	Exterior metal panels	1	LS									\$ 171,756.03
	At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal.	1	LS	\$ 12,240.00	\$ 12,240.00	\$ 6,825.00	\$ 6,825.00	\$ -	\$ -	\$ 19,065.00	\$ 19,065.00	
	If sheathing has completely weathered away, replace the sheathing in-kind.	1	LS	\$ 74,800.00	\$ 74,800.00	\$ 15,912.00	\$ 15,912.00	\$ -	\$ -	\$ 90,712.00	\$ 90,712.00	
S8.2	Interior Metal Panels		LS									\$ 171,756.03
	Grind rusted steel until bare metal is exposed and apply a rust-inhibitive coating.	1	LS	\$ 12,240.00	\$ 12,240.00	\$ 6,825.00	\$ 6,825.00	\$ -	\$ -	\$ 19,065.00	\$ 19,065.00	
	If during this process members are discovered to be significantly corroded, take corrective action such as repairing, reinforcing, or replacing the member in question.	1	LS	\$ 74,800.00	\$ 74,800.00	\$ 15,912.00	\$ 15,912.00	\$ -	\$ -	\$ 90,712.00	\$ 90,712.00	
S8.3	Roof joists	1	LS									\$ 18,775.08
	Engage an engineer to analyze the area tributary to where the roof joists from the side building bear.	1	LS	\$ -	\$ 2,000.00	\$ 2,000.00	\$ -	\$ -	\$ 2,000.00	\$ 2,000.00		
	Reinforce or retrofit the structure as necessary. This will likely consist of installing new steel beams to reinforce the existing wind girts, installing new cross bracing to increase lateral capacity of building to brace the east addition, and local column reinforcing to increase vertical capacity.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	\$ 10,000.00	
S8.4	CMU walls	1	LS									Pricing by others
	Investigate the foundations and subsurface conditions around the east addition.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Provide adequate drainage in the area surrounding the addition to mitigate potential soil consolidation.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Repair cracks in CMU walls to prevent further deterioration of these areas.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
	Install crack monitors to determine if movement is continuing or has stopped.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

G8.1	Exterior siding, east addition	1	LS										\$ 4,293.24
	Repaint exterior siding and clean the translucent panels on the inside and outside.	1	LS	\$ 752.64	\$ 752.64	\$ 1,991.36	\$ 1,991.36	\$ -	\$ -	\$ 2,744.00	\$ 2,744.00		
G8.2	Interior paint, east addition	1	LS										\$ 2,453.28
	Repaint interior of east addition.	1	LS	\$ 752.64	\$ 752.64	\$ 815.36	\$ 815.36	\$ -	\$ -	\$ 1,568.00	\$ 1,568.00		
G8.3	Electrical fixtures	1	LS										\$ 4,693.77
	Install conduit for electrical wires to surface-mounted fixtures.	1	Allow	\$ -	\$ -	\$ -	\$ 3,000.00	\$ -	\$ -	\$ -	\$ 3,000.00		
	Subtotal - Direct Cost				\$ 176,263.48		\$ 55,248.14		\$ 10,213.00		\$ 241,724.62		
	Sales and Locality Tax	6	%		\$ 10,575.81				\$ 612.78		\$ 11,188.59		
	Subtotal										\$ 252,913.21		
	General Conditions	15	%								\$ 37,936.98		
	Subtotal										\$ 290,850.19		
	Contingency	30	%								\$ 87,255.06		
	Subtotal										\$ 378,105.25		
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)										\$ 378,200.00	\$ 378,200.00	

**Summary:**

Gray Barn is a two-story wood framed structure with horse stalls on the lower level and storage on the upper level. There are two exits via sliding doors on either side of the building. The only way to access the second story is by wooden ladder in the center of the building. Water service to the building was provided by an outdoor spigot.

Large cylindrical wood posts nominally embedded into the soil subgrade act as gravity and lateral support for wood joists and girders above the ground floor and for wood trusses at the roof level. The lateral system of the barn is not clear, but likely relies upon the embedment of the wood posts into the soil to resist lateral loading. The perimeter walls are partially obscured by existing finishes which hide the presence of diagonal braces if they exist. The stalls are separated by wood siding. Wood headers and posts running east-west provide support for gravity loads and form stall entrances. It appears there have been several alterations to the building's original structure, with many joists sistered with new lumber and multiple posts present near each other. Some posts have been cut.

Life Safety:

L 9.1 **Observation:** One exit has a chain across, which restricts egress. Egress should not be restricted while building is occupied.
Recommendations: Ensure that chain is only provided when building is unoccupied (NFPA 101, 7.2.1.5.1).

Note: While NFPA 101 is a code written for human safety, it references NFPA 150 which is a code written for animal safety. The state of Maryland does not enforce the use of NFPA 150, however the guidance provided in NFPA 150 is relevant to this facility and should be considered when describing the life safety aspects of the building.

L 9.2 **NFPA 150 Recommendation:** If means of egress is intended for animal relocation, provide a minimum clear width of approximately 2.5 times the width of the largest animal (a horse) (NFPA 150, 12.2.2)
a. **Note:** This is already the case in the Gray Barn, however it is worth noting for reference.

L 9.3 **NFPA 150 Recommendation:** In horse facilities with sleeping quarters, provide an automatic fire alarm system which activates an alarm signal and reports to a central monitoring station upon activation of a manual pull station, automatic sprinkler system flow switch, or any required detection system (ie. smoke detector, heat detector, etc.)

L 9.4 **NFPA 150 Recommendation:** In horse facilities with sleeping quarters, provide an automatic sprinkler system.
a. **Note:** Horses are not capable of leaving or otherwise reacting to a fire hazard. Sprinklers offer an effective means of containing the fire until responders can arrive to escort the horses out of the building.

Life Safety References:

- NFPA 101
- Group U (IBC)



L 9.1 – Gray Barn Exit

Structural:

S 9.1 **Observation:** The concrete wall on the south side of the Gray Barn is deteriorated at its base, shows signs of lateral movement, and does not appear to have any footing. It is very likely that the wall does not satisfy code requirements for frost protection, overturning, or sliding. It is unclear whether or not this wall continues under the south side of the barn itself. If confirmed, the deterioration and lateral movement of the wall poses a risk to the building's structure.
Recommendation: Unless action is taken, we anticipate that the wall will continue to deteriorate and move laterally. We recommend replacing the knee wall with a new wall assembly governed by a new engineered design. We recommend removing interior wall finishes to expose the framing along the south exterior wall to allow for a structural engineer to evaluate the existing wood framing and foundation condition of the southern wall and verify if the existing exterior concrete wall pour continues into the footprint of the barn.

S 9.2 **Observation:** The concrete site wall at the north side of the building has deteriorated significantly. Embedded steel has become exposed and biological growth within the wall is extensive. The slab-on-grade surrounding the wall has deteriorated as well. The extent and condition of the foundation below-grade is unclear.
Recommendation: The exposed steel elements will continue to corrode and cause spalling of the concrete wall. We recommend replacement of this wall. Alternatively, the wall could remain provided a design team evaluates the condition of the wall and develops appropriate repairs to prevent further deterioration. These repairs would likely include removing concrete around exposed steel elements, cleaning and painting the embedded steel, and then patching the concrete around the corroded steel.

S 9.3 **Observation:** Several wood posts are heavily decayed at their bases. These posts do not appear pressure-treated or otherwise waterproofed. It is unclear if wood posts are in good condition below grade. Wood siding has also deteriorated over time due to exposure to the elements and typical wear and tear.
Recommendation: Evaluate all wood posts for signs of decay above and below grade. Replace all decayed posts with new, pressure-treated posts to protect against future rot. Provide adequate concrete foundation support for new posts. New posts shall be designed by a licensed structural engineer. We also recommend engaging a geotechnical engineer to determine the capacity and properties of the existing soil. This work will require temporary shoring of the barn structure, excavation for new footings and piers, and installation of new footings and piers. Replace heavily deteriorated non-structural wood with new pressure-treated lumber. Consider taking steps to reduce moisture exposure and water infiltration within the barn.

S 9.4 **Observation:** Many joists and headers at the lower level have been sistered with new lumber, and many posts have either been added or cut over the building's service life. It is clear from these observations that the load path has changed significantly over time and is at this point effectively indeterminate.
Recommendation: Inspect and analyze the building further to determine the load path. Once this is done, modify and reinforce the structure as necessary to ensure the facility is up to current code standards.



Exterior view of Gray Barn, taken facing east.



S 9.1 – Concrete wall with no footing. It is unclear if this wall continues under the south side of the barn.



S 9.2a – North side of Gray Barn. Deteriorating concrete wall.



S 9.2b – Exposed steel in north concrete wall.



S 9.3a – Deteriorated siding and post in Gray Barn stall.



S 9.3b – Deteriorated lumber near stall entrance.



S 9.4a – Typical framing condition at lower level stalls.



S 9.4b – Multiple beams that appear to have been constructed at different times bear at the same location.



S 9.4c – Multiple beams that appear to have been constructed at different times bear at the same location.



S 9.4d – Cut wooden post near other framing, including another wooden post.

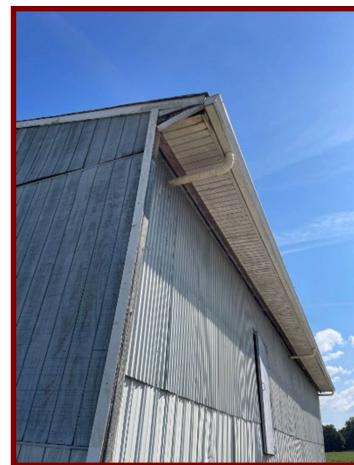
General Conditions:

G 1.1 **Observation:** Numerous siding panels, wood trim, and wooden egress door and stall windows were observed to be damaged or deteriorated.

Recommendation: Replace damaged siding, trim, and doors.



G 9.1a – Damaged siding.



G 9.1b – Soffit.



G 9.1c – Door



G 9.1d – extend down spout or provide splash guard.

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Gray Barn												
L9.1	One exit has a chain across, which restricts egress. Egress should not be restricted while building is occupied.	1	LS									No costs required
	Ensure that chain is only provided when building is unoccupied (NFPA 101, 7.2.1.5.1).	1	LS									
L9.2	If means of egress is intended for animal relocation, provide a minimum clear width of approximately 2.5 times the width of the largest animal (a horse) (NFPA 150, 12.2.2)	1	LS									No costs required
	Note: This is already the case in the Gray Barn, however it is worth noting for reference.	1	LS									
L9.3	In horse facilities with sleeping quarters, provide an automatic fire alarm system which activates an alarm signal and reports to a central monitoring station upon activation of a manual pull station, automatic sprinkler system flow switch, or any required detection system (ie. smoke detector, heat detector, etc.)	1	LS									No costs required
L9.4	Automatic Sprinkler system	1	LS									\$ 15,413.43
	Note: Horses are not capable of leaving or otherwise reacting to a fire hazard. Sprinklers offer an effective means of containing the fire until responders can arrive to escort the horses out of the building.	1	LS	\$ 6,000.00	\$ 6,000.00	\$ 4,000.00	\$ 4,000.00	\$ -	\$ -	\$ 10,000.00	\$ 10,000.00	
S9.1	Concrete wall	1	LS									\$ 9,321.29
	We recommend replacing the knee wall with a new wall assembly governed by a new engineered design.	1	LS	\$ 721.11	\$ 721.11	\$ 1,048.06	\$ 1,048.06	\$ 230.69	\$ 230.69	\$ 1,999.86	\$ 1,999.86	
	We recommend removing interior wall finishes to expose the framing along the south exterior wall to allow for a structural engineer to evaluate the existing wood framing and foundation condition of the southern wall, and verify if the existing exterior concrete wall pour continues into the footprint of the barn.	1	LS	\$ -	\$ -	\$ 4,047.65	\$ 4,047.65	\$ -	\$ -	\$ 4,047.65	\$ 4,047.65	
S9.2	Concrete wall, north side	1	LS									\$ 10,928.76
	We recommend replacement of this wall.	1	LS	\$ 2,556.67	\$ 2,556.67	\$ 3,715.83	\$ 3,715.83	\$ 817.92	\$ 817.92	\$ 7,090.42	\$ 7,090.42	
S9.2 ALTERNATE	Concrete wall, north side	1	LS									\$ 3,661.57
	Alternatively, the wall could remain provide a design team evaluate the condition of the wall and develop appropriate repairs to prevent further deterioration.	1	LS	\$ 3.51	\$ 3.51	\$ 2,321.75	\$ 2,321.75	\$ 50.31	\$ 50.31	\$ 2,375.57	\$ 2,375.57	

S9.3	Wood posts		LS										\$ 37,839.96
	Evaluate all wood posts for signs of decay above and below grade.	1	LS	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00		
	Replace all decayed posts with new, pressure-treated posts to protect against future rot.	1	LS	\$ -	\$ -	\$ 7,000.00	\$ 7,000.00	\$ -	\$ -	\$ 7,000.00	\$ 7,000.00		
	We also recommend engaging a geotechnical engineer to determine the capacity and properties of the existing soil.	1	LS	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00		
	This work will require temporary shoring of the barn structure, excavation for new footings and piers, and installation of new footings and piers.	1	LS	\$ 3,900.00	\$ 3,900.00	\$ 650.00	\$ 650.00	\$ -	\$ -	\$ 4,550.00	\$ 4,550.00		
	Replace heavily deteriorated non-structural wood with new pressure-treated lumber.	1	Allow	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00		
S9.4	Structure Reinforcing	1	LS										\$ 13,872.08
	Inspect and analyze the building further to determine the load path.	1	LS	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00	\$ -	\$ -	\$ 4,000.00	\$ 4,000.00		
	Once this is done, modify and reinforce the structure as necessary to ensure the facility is up to current code standards.	1	Allow	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00	\$ -	\$ -	\$ 5,000.00	\$ 5,000.00		
G1.1	Damaged exterior elements	1	LS										\$ 86,662.91
	Replace damaged siding, trim, and doors.	1	LS	\$ 44,740.00	\$ 44,740.00	\$ 11,485.60	\$ 11,485.60	\$ -	\$ -	\$ 56,225.60	\$ 56,225.60		
	Subtotal - Direct Cost				\$ 57,921.29		\$ 56,268.89		\$ 1,098.92		\$ 115,289.10		
	Sales and Locality Tax	6	%		\$ 3,475.28				\$ 65.94		\$ 3,541.21		
	Subtotal										\$ 118,830.31		
	General Conditions	15	%								\$ 17,824.55		
	Subtotal										\$ 136,654.86		
	Contingency	30	%								\$ 40,996.46		
	Subtotal										\$ 177,651.31		
	Estimated Total Cost of Construction (Rounded to Nearest Hundred)										\$ 177,700.00	\$ 177,700.00	

**Summary:**

The Small Arena is a pre-engineered metal framed indoor riding and Assembly area with metal roofing and siding. The single-story structure consists of a riding arena and a back storage space. Water service was provided to the building by an outdoor spigot. Electrical service is also provided.

The structure is composed of large, long-span steel frames spanning the width of the structure, which act as the main gravity system and likely form the primary north/south lateral system. Vertical cable cross-braces between frames resist lateral loads in the east/west direction. Cross-brace cables are also present at the gable ends of the building providing additional resistance in the north/south direction. Excepting the frames themselves, the roof structure consists of steel channel purlins and a roof deck made of corrugated metal. Horizontal cross braces at the roof level transfer diaphragm forces into the lateral system. The upper walls consist of corrugated metal sheathing fastened to spandrel beams. The walls are concrete below the mid-height windows. The posts bear on these concrete walls.

Life Safety:

L 10.1 Observation: The Small Arena only has one exit from the building and a separate large door for horses. Both doors are located at the front end of the building adjacent to one another. NFPA 101 requires that two exits be provided for assembly occupancies with less than 600 occupants (NFPA 101, 13.2.4).

Recommendations: Provide a second remote means of egress, located in the opposite corner of the building.

Life Safety References:

- NFPA 101
- Group A-4 (IBC)



L 10.1 – Small Arena

Structural:

S 10.1 Observation: Rusted panels at the building exterior. Openings in wall sheathing can lead to water infiltration and are often focal points for further deterioration. Current locations where rust is present will likely degrade further as time passes.

Recommendation: At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal. If sheathing has completely weathered away, replace the sheathing in-kind.

S 10.2 Observation: Minor surface rust at many locations, likely due to the structure's general exposure to atmospheric moisture and expected decay of surface primer over its service life.

Recommendation: Grind rusted steel until bare metal is exposed and apply a rust-inhibitive coating. If during this process members are discovered to be significantly corroded, take corrective action such as repairing, reinforcing, or replacing the member in question.

S 10.3 Observation: The flange of a column on the east side of the structure (opposite the entrance, second from left) was dented at roughly mid-height.

Recommendation: Due to the location of the damage it is possible that the dent occurred during construction or an impact during the building's service life and not due to gravity loads in excess of structural capacity. However, we recommend a structural engineer provide a full building gravity analysis to review the gravity system capacity. Repair the damaged column and reinforce as required to meet code.

S 10.4 Observation: From the ground, it appears that one of the primary frame beams has rotated laterally on the column seat. Given the orientation of the roof diagonal tension rods, there is a chance that this rotation was caused by wind loads acting upon the structure. The primary roof support beams are deeper at midspan than they are at the columns. This shape suggests that the primary purpose of these beams is to support both gravity and lateral loads.

Recommendation: We also recommend checking the beam with a level to verify whether it has rotated on the column seat and by how much.

S 10.5 Observation: On the southeast side of the building, at a column below which the letter "K" is posted on the wall, the stiffener plate of a beam to post connection has buckled. It is unclear whether this occurred during construction or during the building's service life.

Recommendation: Engage an engineer to analyze the structure and confirm the stiffeners as designed are sufficient to support the load from the girder. If connection is not adequate, repair structure as required. If connection is adequate, repair the buckled bearing plate.



S 10.1 – Exterior view of Small Arena, facing southeast.



S 10.2 – Interior view of Small Arena. Note damaged column second from left.



S 10.4a – Condition of framing. Vicinity of column "K".



S 10.4b – Deflected beam end and column top at column "K".



S 10.5a – Buckled bearing plate stiffener at column "M".



S 10.5b – Alternate view of buckled bearing plate stiffener.

General Conditions:

G 10.1 Observation: Coating of building exterior was deteriorated.

Recommendation: Repaint exterior.

G 10.2 Observation: Several panels of the windows of the north and south elevations were missing.

Recommendation: Replace missing window panels.



G 10.1a – Exterior finish deteriorating.



G 10.1b – Exterior finish deteriorating.



G 10.2 – Missing windows

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Small Arena												
L10.1	Building Egress	1	LS									\$ 7,170.11
	Provide second remote means of egress, located in the opposite corner of the building.	1	LS	\$ 3,175.00	\$ 3,175.00	\$ 1,415.50	\$ 1,415.50	\$ -	\$ -	\$ 4,590.50	\$ 4,590.50	
S10.1	Metal wall sheathing	1	LS									\$ 91,550.60
	At areas with limited to no section loss, clean the sheathing down to bare metal and apply a rust-inhibitive coating compatible with the base metal.	1	LS	\$ 6,534.00	\$ 6,534.00	\$ 3,655.00	\$ 3,655.00	\$ -	\$ -	\$ 10,189.00	\$ 10,189.00	
	If sheathing has completely weathered away, replace the sheathing in-kind.	1	LS	\$ 39,930.00	\$ 39,930.00	\$ 8,494.20	\$ 8,494.20	\$ -	\$ -	\$ 48,424.20	\$ 48,424.20	
S10.2	Interior Metal panels	1	LS									\$ 91,550.60
	Grind rusted steel until bare metal is exposed and apply a rust-inhibitive coating.	1	LS	\$ 6,534.00	\$ 6,534.00	\$ 3,655.00	\$ 3,655.00	\$ -	\$ -	\$ 10,189.00	\$ 10,189.00	
	If during this process members are discovered to be significantly corroded, take corrective action such as repairing, reinforcing, or replacing the member in question.	1	LS	\$ 39,930.00	\$ 39,930.00	\$ 8,494.20	\$ 8,494.20	\$ -	\$ -	\$ 48,424.20	\$ 48,424.20	
S10.3	Column flange	1	LS									\$ 9,891.80
	However, we recommend a structural engineer provide a full building gravity analysis to review the gravity system capacity.	1	LS	\$ -	\$ -	\$ 6,000.00	\$ 6,000.00	\$ -	\$ -	\$ 6,000.00	\$ 6,000.00	
	Repair the damaged column and reinforce as required to meet code.	1	Allow	\$ 226.00	\$ 226.00	\$ 107.00	\$ 107.00	\$ -	\$ -	\$ 333.00	\$ 333.00	
S10.4	Frame beam	1	LS									\$ 156.19
	We also recommend checking the beam with a level to verify whether it has rotated on the column seat and by how much.	1	LS		\$ -	\$ 100.00	\$ 100.00	\$ -	\$ -	\$ 100.00	\$ 100.00	
S10.5	Column repair	1	LS									\$ 5,125.46
	Engage an engineer to analyze the structure and confirm the stiffeners as designed are sufficient to support the load from the girder.	1	LS	\$ -	\$ -	\$ 2,000.00	\$ -	\$ -	\$ -	\$ 2,000.00	\$ -	
	If connection is not adequate, repair structure as required.	1	Allow	\$ 2,793.00	\$ 2,793.00	\$ 279.30	\$ 279.30	209.16	\$ 209.16	\$ 3,281.46	\$ 3,281.46	
S10.5 ALTERNATE	Column repair	1	LS									\$ 303.02
	If connection is adequate, repair the buckled bearing plate.	1	EA	\$ 134.00	\$ 134.00	\$ 60.00	\$ 60.00	\$ -	\$ -	\$ 194.00	\$ 194.00	
G10.1	Coating of building exterior was deteriorated.		LS									\$ 22,225.85
	Repaint exterior.	1	LS	\$ 6,969.60	\$ 6,969.60	\$ 7,260.00	\$ 7,260.00	\$ -	\$ -	\$ 14,229.60	\$ 14,229.60	
G10.2	Window panels	1	LS									\$ 13,726.37
	Replace missing window panels.	1	LS	\$ 8,100.00	\$ 8,100.00	\$ 688.00	\$ 688.00	\$ -	\$ -	\$ 8,788.00	\$ 8,788.00	

Subtotal - Direct Cost				\$ 114,325.60		\$ 40,208.20		\$ 209.16		\$ 154,742.96	
Sales and Locality Tax	6	%		\$ 6,859.54				\$ 12.55		\$ 6,872.09	
Subtotal										\$ 161,615.05	
General Conditions	15	%								\$ 24,242.26	
Subtotal										\$ 185,857.30	
Contingency	30	%								\$ 55,757.19	
Subtotal										\$ 241,614.49	
Estimated Total Cost of Construction (Rounded to Nearest Hundred)										\$ 241,700.00	\$ 241,700.00

**Summary:**

The Red Brick House is a two-level residential structure. It has an unfinished basement foundation with CMU walls, brick façade, interior wood framing, asphalt roofing, and a central brick chimney. The main level is divided to form a duplex style living arrangement, however, only one side contains a full kitchen. The laundry room is shared space which provides access to either side from the interior. Each side of the main level has its own exterior entry. The utilities are in the basement and the main fuel source for the building is propane.

One of the tenants was quarantined during our structural and life safety visit, this report only includes general condition assessment notes.

General Conditions:

G 11.1 **Observation:** There are smoke alarms in each sleeping room and in the hall outside the sleeping rooms and restroom, but not in the kitchen or living area. The devices that are in place were not tested due to the presence of a household pet.
Recommendation: Place an additional smoke alarm between the kitchen and living areas. Test each existing device and replace as necessary.

G 11.2 **Observation:** Flooring gap from bedroom hall to the bathroom tile.
Recommendation: Install a transition strip to protect the edges of each floor.

G 11.3 **Observation:** Drywall damage and/or cracking in several locations (see photos).
Recommendation: Repair drywall.

G 11.4 **Observation:** The water heater appears fairly new and in good working condition but there are no inspection tags.
Recommendation: Ensure regular inspections and maintenance occur and keep proper documentation.

G 11.5 **Observation:** The exterior heat pump unit appears weathered but in working condition. There are no tags indicating inspections or maintenance. The interior coil and fan unit appears new and in good working condition.
Recommendation: Ensure regular inspections and maintenance occur and keep proper documentation.

G 11.6 **Observation:** There are several unsealed penetrations through the walls in the basement.
Recommendation: Properly seal all penetrations and repair the holes in the CMU wall.

G 11.7 **Observation:** Exterior doors are not sealed and trim shows signs of decay.
Recommendation: Properly seal around doors after repairing or replacing the door trim.

G 11.8 **Observation:** Screening on one of the exterior doors has holes and tears.
Recommendation: Replace screening.

G 11.9 **Observation:** Wood siding on gable ends needs a fresh coat of paint. One of the gable end vents is damaged.
Recommendation: Sand wood siding prior to painting gable ends. Replace damaged vent.

G 11.10 **Observation:** Brick chimney shows signs of decay and cracked mortar joints.
Recommendation: Wash brick chimney and repair mortar. Inspect the flue prior to use.

G 11.11 **Observation:** Algae and discoloration were observed on roof. Fallen leaves have accumulated in the gutters. There is also brick discoloration at the bottom of the wall, indicating improper drainage of storm water from roof.
Recommendation: Wash roofing and clean out the gutters.

G 11.12 **Observation:** Large cracks and uneven settlement in walkway create trip hazards.
Recommendation: Repair or replace sections of walkway with excessive cracking or uneven surfaces.

G 11.13 **Observation:** The exterior doorway at the kitchen includes a door which swings into the building as well as a storm door which swings out. The hinges of the doors are on opposite sides of the opening which makes it difficult for a person to maneuver through the opening.
Recommendation: Reverse the swing of the exterior storm door.



G 11.1a – Bedroom Smoke Alarm



G 11.1b – Hall Smoke Alarm



G 11.2 – Flooring Transition



G 11.3a – Drywall Cracking



G 11.3b – Drywall Damage



G 11.3c – Drywall Cracking



G 11.4a – Water Heater



G 11.4b – Water Heater



G 11.5a – Exterior Condensing Unit



G 11.5b – Exterior Condensing Unit



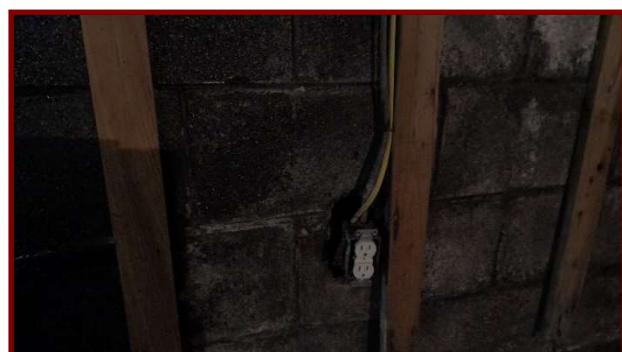
G 11.5c – Interior Unit



G 11.6a – Holes in CMU



G 11.6b – Unsealed Penetration



G 11.6c – Unsealed Penetration



G 11.7 – Door trim and sealant



Propane Source

Area	Description	QTY	Unit	Material Unit	Material Total	Labor Unit	Labor Total	Sub / Equip Unit	Sub / Equip Total	Unit Price	Total Cost	Total Cost With Markup
Red Brick House												
G11.1	Smoke alarm	1	LS									\$ 1,037.63
	Place an additional smoke alarm between the kitchen and living areas.	1	EA	\$ 35.00	\$ 35.00	\$ 25.00	\$ 25.00	\$ -	\$ -	\$ 60.00	\$ 60.00	
	Test each existing device and replace as necessary.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 600.00	\$ 600.00	\$ 600.00	\$ 600.00	
G11.2	Flooring gap from bedroom hall to the bathroom tile.	1	EA									\$ 129.70
	Install a transition strip to protect the edges of each floor.	3	LF	\$ 13.35	\$ 40.05	\$ 14.15	\$ 42.45	\$ -	\$ -	\$ 27.50	\$ 82.50	
G11.3	Drywall damage and/or cracking in several locations (see photos).	1	LS									\$ 86.47
	Repair drywall.	1	LS	\$ 5.00	\$ 5.00	\$ 50.00	\$ 50.00	\$ -	\$ -	\$ 55.00	\$ 55.00	
G11.4	Water Heater	1	LS									No costs required
	Ensure regular inspections and maintenance occur and keep proper documentation.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
G11.5	Exterior heat pump	1	LS									No costs required
	Ensure regular inspections and maintenance occur and keep proper documentation.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
G11.6	Unsealed penetrations		LS									\$ 856.83
	Properly seal all penetrations and repair the holes in the CMU wall.	1	LS	\$ 325.00	\$ 325.00	\$ 220.00	\$ 220.00		\$ -	\$ 545.00	\$ 545.00	
G11.7	Door sealant		LS									\$ 347.86
	Properly seal around doors after repairing or replacing the door trim.	1	LS	\$ 75.60	\$ 75.60	\$ 145.66	\$ 145.66	\$ -	\$ -	\$ 221.26	\$ 221.26	
G11.8	Exterior door screening	1	LS									\$ 70.54
	Replace screening.	1	LS	\$ 9.87	\$ 9.87	\$ 35.00	\$ 35.00	\$ -	\$ -	\$ 44.87	\$ 44.87	
G11.9	Wood siding/gable vent	1	LS									\$ 4,468.10
	Sand wood siding prior to painting gable ends.	1	Allow	\$ 864.00	\$ 864.00	\$ 1,728.00	\$ 1,728.00	\$ -	\$ -	\$ 2,592.00	\$ 2,592.00	
	Replace damaged vent.	1	Allow	\$ -	\$ -			\$ -	\$ 250.00	\$ 250.00	\$ 250.00	
G11.10	Brick chimney		LF									\$ 3,977.58
	Wash brick chimney and repair mortar.	1	Allow	\$ -	\$ -	\$ -	\$ -	\$ 2,500.00	\$ 2,500.00	\$ 2,500.00	\$ 2,500.00	
	Inspect the flue prior to use.	1	LS	\$ -	\$ -	\$ 30.00	\$ 30.00	\$ -	\$ -	\$ 30.00	\$ 30.00	
G11.11	Roofing		S.F.									\$ 786.08
	Wash roofing and clean out the gutters.	1	LS	\$ -	\$ -	\$ -	\$ -	\$ 500.00	\$ 500.00	\$ 500.00	\$ 500.00	
G11.12	Walkway		LS									\$ 10,760.60
	Repair or replace sections of walkway with excessive cracking or uneven surfaces.	1	Allow		\$ -		\$ -	\$ 6,844.44	\$ 6,844.44	\$ 6,844.44	\$ 6,844.44	
G11.13	Exterior door	1	Ea.					\$ 50.00	\$ -	\$ -	\$ 50.00	
	Reverse the swing of the exterior storm door.	1	Ea.		\$ -	\$ -	\$ 50.00	\$ -	\$ -	\$ -	\$ 50.00	

Subtotal - Direct Cost				\$ 1,354.52		\$ 2,326.11		\$ 10,694.44		\$ 14,375.07	
Sales and Locality Tax	6	%		\$ 81.27				\$ 641.67		\$ 722.94	
Subtotal										\$ 15,098.01	
General Conditions	15	%								\$ 2,264.70	
Subtotal										\$ 17,362.71	
Contingency	30	%								\$ 5,208.81	
Subtotal										\$ 22,571.53	
Estimated Total Cost of Construction (Rounded to Nearest Hundred)										\$ 22,600.00	\$ 22,600.00