



FAIRFAX COUNTY PARK AUTHORITY

Ellmore Farmhouse

MEP Assessment

**2709 West Ox Road
Herndon, VA 20171**



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SWSG PN: 17-084

INTRODUCTION

The Fairfax County Park Authority is evaluating the Ellmore Farmhouse for the Resident Curator program. The Ellmore Farmhouse is located at 2709 West Ox Road at Frying Pan Farm Park. The purpose of this report is to document the existing conditions of the mechanical, electrical, and plumbing systems and to identify deficiencies.

Recommendations for corrections were evaluated for two potential future uses: residential and museum/office. In the museum/office scenario, the scenario evaluates a museum on the first floor and office space on the second floor. The museum/office scenario assumes that the kitchen will be demolished and adaptively reused for museum space.

An Opinion of Probable Cost is provided for correcting the deficiencies for each scenario. The Opinion of Cost assumes that the party who enters into a contract with the County will perform the role of General Contractor. Costs for hazardous materials testing and remediation are not included in the Opinion of Cost.

CODE ANALYSIS

A code analysis was performed for both scenarios to determine the HVAC and plumbing requirements. Occupant loads were used to determine the plumbing requirements and the heat load based on the number of people in the space.

Residential Code Analysis

Use Group

The entire two-story farm house shall be occupied as a single family dwelling unit Residential Group (R3).

Plumbing Requirements

The minimum number of water closets, lavatories, bathtubs or showers, kitchen sink, and automatic clothes washer connection required is one each. The existing full bathroom, kitchen and laundry room on the first floor provide the required number of fixtures.

Museum/Office Code Analysis

Use Group and Occupant Load

The Museum/Office scenario was evaluated with a Museum Occupancy (Assembly Use A3) at first floor and Business Occupancy (B) as Office Use on second floor. The gross floor areas of first and second floors are approximately 1,435 S.F. per floor.

A first-floor occupancy of a museum (Assembly Use A3) that would include all occupiable individual rooms on this floor would yield a calculated net floor area of 1,020 S.F.

- Allowable Maximum Assembly Use Occupant Load for first-floor Museum Occupancy:
 $1,020 \text{ S.F.} \div 30 \text{ S.F. per person} = 34 \text{ persons on the first floor}$
- An Assembly Use (A) with an occupant load of less than 50 persons shall be classified as a Business (B) occupancy.

A second-floor occupancy of Business (B) as Office Use would have a gross floor area of 1,435 S.F.

- Allowable Maximum Occupant Load for second-floor Office Occupancy:
 $1,435 \text{ S.F.} \div 100 \text{ S.F. per person} = 15 \text{ persons on the second floor}$

Total building occupant load under Museum/Office Use would be 49 persons (IBC 2012, Section 303.1.1)

Plumbing Requirements

The minimum plumbing fixture requirement is based on 25 male and 25 female occupants. ($49 \div 2 = 24.5$ persons per male and female occupants) Separate toilet room facilities for men and women would be required since the total occupant load would be greater than 15 persons (IBC 2012, Section 2902.2 Exception 2).

Minimum number of Water Closets Required: 1 per 25 Male and Female occupants for first 50 persons.

Minimum number of Lavatories required: 1 per 40 Male and Female occupants for first 50 persons.

Minimum number of drinking Fountains required: 1 per 100 occupants.

Minimum number of Service Sink required: 1 Service Sink.

As a result of these minimum requirements, the occupant load would require the following:

- A single use toilet room facility for each gender with ADA accessibility (Family or assisted-use toilet facilities) at the first floor.
- ADA accessible (High & Low) electrical water coolers on the first floor.
- A service sink in a new janitor closet on the first floor.

PREVIOUS DESIGN DEVELOPMENT PLANS FOR OFFICE USE

In 2010, SWSG prepared design development plans to adaptively reuse the house for office space on the first and second floors. The layout of the toilet rooms, which would utilize the existing first-floor toilet room and laundry room, would be applicable for the museum/office use.

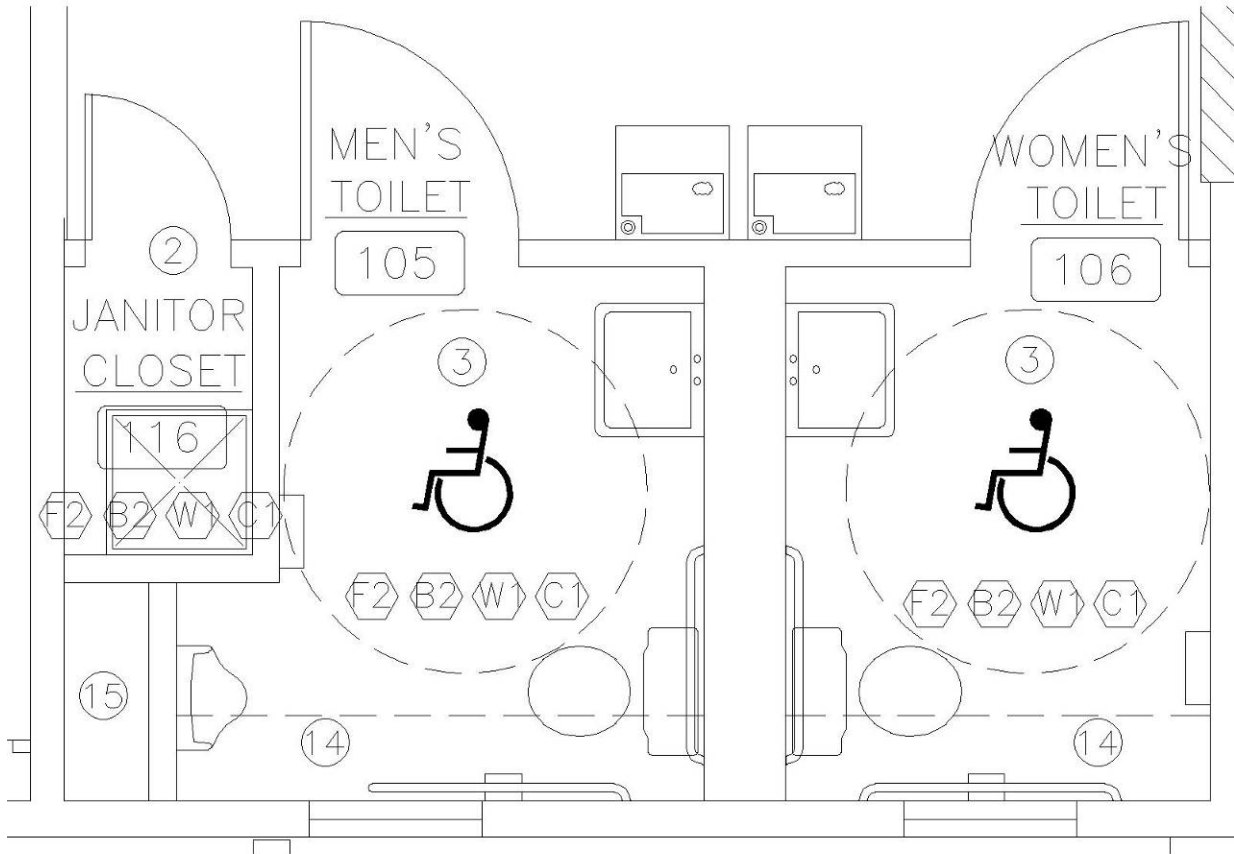


Image 1: Toilet Room Space Plan, 2010

MECHANICAL CONDITION ASSESSMENT AND TREATMENT PLAN

The following description of the facility is based on field observations performed on October 30, 2017 by SWSG.

Mechanical System

The house is heated by a gas-fired boiler located in the basement. There is a single 28x12 combustion air intake (assume 80% free area) which provides for approximately 800 MBH heating capacity based on the 2009 International Fuel Gas Code (one square inch of free area is rated for 3000 BTU/hr.). We believe the capacity of the boiler to be between 100 MBH and 150 MBH, therefore the combustion air intake is adequately sized. The age of the boiler is unknown, but seven years ago the boiler was an oil-fired unit. The boiler flue is connected to a masonry chimney. The boiler is not in use at the current time and it is unknown if it is operational. A gas meter is installed and flexible Corrugated Stainless Steel Tubing (CSST gas piping) has been extended into the basement.



Image 2: Uninsulated Copper Piping



Image 3: Gas-fired Hydronic Boiler



Image 4: Utilities meter outside



Image 5: Electric water heater

Heating water is pumped through uninsulated copper piping throughout the house to floor-mounted radiators in a series layout. There are two thermostats on the first floor and two thermostats on the second floor; however, there are only three hydronic zone valves controlling three heating zones. It is unknown if the controls are operational.

An expansion tank is located within the basement ceiling space and has been concealed with drywall and paint.

An underground oil storage tank, located in the northeast yard near the stairs to the second floor, supplies fuel oil to the boiler through underground single-walled fuel oil piping. The fuel fill pipe is located directly in the yard above the storage tank. The vent pipe extends through the ground and slab and is located near the stairwell going to the second floor on the northwest side of the house.

All of the radiator panel covers on the first floor have significant damage. On the second floor in Bedroom 201, 204, and Office 209 there is significant damage to the radiator fins and many of the radiator panel covers have been removed.

A single radiator, installed in the kitchen, is a Multifin Type K freestanding floor radiator. It was likely installed at the same time as the baseboard radiators; however, this radiator is not working.



Image 6: Typical Damaged Radiator



Image 7: Another Damaged Radiator, 2nd floor bedroom

There are fireplaces located throughout the house that are not in use. The basement has ducts that drop into the crawl space and resurface in the family room closet. During the survey there was no evidence of a HVAC unit; the purpose of the ducts is unknown.

There are several wall grilles installed in the house on the first and second floors. The purpose/function of these grilles is unknown since they do not stack from floor to floor and there was no ductwork found connected to them.



Image 8: Ductwork in Closet 112



Image 9: Wall Grille

The house does not currently have an air-conditioning system for cooling.

The first-floor bathroom and laundry room have exhaust fans in the ceiling that are not operational. No outlet for either exhaust fan was found. The second-floor bathroom does not have an exhaust fan. The attic has a louver in the wall for natural ventilation.

The clothes dryer is located in the laundry room. The dryer exhaust is routed low and terminates on the southeast side of the house through a wall-mounted hood.

Proposed Mechanical – Residential and Museum/Office

Many components of the proposed mechanical system would be similar for both the residential and museum/office uses, though the size of the ductwork and units would vary in the design.

- The existing hydronic heating water piping may be reused for heating; however, non-functioning radiators need to be replaced. The piping shall be pressure tested, cleaned, and repaired as required. Since the existing gas-fired boiler is less than 8 years old, there is no need to replace within the next few years. The average lifespan of a gas-fired boiler is 12-15 years.
- A dehumidifier is recommended in the basement to remove moisture.
- A split system air conditioning system is proposed for the first floor. The air handling unit (AHU) may be installed on the first floor under the front stairwell. Supply air will be ducted down to the crawl space. The front part of the building can be served by ductwork in the crawl space and floor registers. The supply air ductwork for the rear of the building can be routed up through the floor inside a chase in the toilet room and overhead in a bulkhead at the ceiling. Air can be distributed through sidewall registers. Return air can be returned through a wall-mounted grille. An air-cooled condensing unit (air conditioner) may be installed outside at grade behind a screened enclosure. Refrigerant piping would connect the indoor and outdoor units.

- A split system air conditioning system is also proposed for the first and second floor spaces. The first floor AHU may be installed in the space beneath the stairs. The ductwork could extend into the cellar to supply the first floor through floor-mounted registers. A return air grille could be mounted at the stair closet at the proposed unit. The second floor AHU may be installed horizontally in the attic. Supply air would be ducted above the ceiling in the attic and distributed through ceiling-mounted registers. Return air would be returned through a ceiling mounted grille. The air-cooled condensing unit would be installed outside at grade behind a screened enclosure. Refrigerant piping would connect the indoor and outdoor units.
- A ductless mini-split air conditioning system is proposed for each of the two potential second-floor offices at the rear of the building. The AHUs would be mounted on a wall in each room. There is no attic above these rooms to allow for a central system and bulkheads are not desired in these office areas. A dual zone condensing unit capable of providing cooling for both AHUs would be installed outside at grade in a screened enclosure. Refrigerant piping would connect the indoor and outdoor units.
- An attic fan is recommended for attic ventilation. It may be connected to the existing gable louvers.
- It is advised that the CSST line for the natural gas pipe be bonded and grounded to avoid being punctured in the event of a lightning strike in the area.
- Clean any ducts that may be reused.

Additional Proposed Mechanical (Residential)

- Exhaust fans should be provided for the kitchen, toilet room, and laundry room on the first floor. The fans would need to be vented through the roof. If a water closet is installed on the second floor, this room would also require an exhaust fan.

Additional Proposed Mechanical (Museum/Office)

- Exhaust fans should be provided for each toilet room on the first floor. The fans should be vented through the roof.

Existing Plumbing

The existing utility-provided domestic water service enters the house through the basement wall adjacent to the sanitary sewer. Copper domestic water piping in the basement distributes water to the plumbing fixtures. The sanitary sewer is connected to the utility and not a septic system. The sanitary sewer piping is comprised of cast iron, PVC, and ABS piping. It appears that it may have once been connected to a septic system and that some of the piping is abandoned in place.



Image 10: Sanitary Sewer Piping



Image 11: Sanitary Sewer Piping

A 40-gallon electric water heater in the basement, with an installation date of September 1995, provides domestic hot water to the house. It appears to be in fair condition but has reached the end of its expected lifespan.

The basement has two sump pumps along with floor drains. The sump pumps are located on opposite sides of the basement and discharge out of the southeast side of the house to an open yard inlet.



Image 12: Sump Pump Basement



Image 13: Sump Pump Within Floor Drain

The first floor kitchen has a sink with garbage disposer and a dishwasher that is no longer in working order. The water piping is copper and is routed from the basement below. The dishwasher is connected to the domestic hot water piping.

A clothes washer and dryer are located in the laundry room. Water is delivered to the washer through polybutylene domestic water piping. The laundry room also has a laundry sink that is being served with copper piping routed from the basement below. The laundry sink appears to be in poor condition. Two exterior hose bibbs are located on the northwest and southeast sides of the house.

The first floor has a bathroom with a shower, water closet, and counter-mounted lavatory. The toilet, shower fixtures, shower stall, and lavatory fixture are in poor condition.

The second-floor bathroom has a counter-mounted lavatory and a connection for a water closet. The drain trap for the lavatory has been removed and its sanitary sewer line has been capped. The water closet has been removed and its sanitary sewer line has been capped at the floor. A drinking fountain, once installed on the wall behind the water closet, is no longer present. The drinking fountain was removed and the sanitary sewer piping was capped.



Image 14: Capped Sanitary Sewer Line



Image 15: Earlier Location of Drinking Fountain

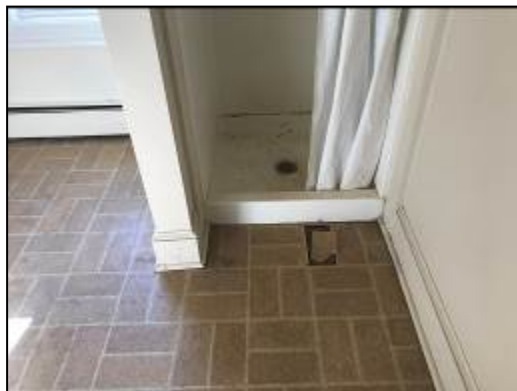


Image 16: Stall shower



Image 17: Water closet

On the exterior of the house there are nine downspouts that discharge storm water directly onto the ground, in open site drains, or directly on the house. The gutter and downspouts appear to be cluttered with leaves and debris.

Proposed Plumbing – Residential and Museum/Office

Many components of the proposed plumbing system would be similar for both the residential and museum/office uses, though the number of fixtures and accessibility requirements vary.

- The domestic water piping entrance to the building shall be rerouted to maintain the code required separation from the sanitary sewer piping. The abandoned piping in the basement should be removed.
- It is recommended to test the sump pumps to verify proper operation.
- The water heater is past its useful life. It is recommended to replace the water heater in kind.
- The gutters and downspouts should be cleaned, repaired, and splash blocks added.
- Optional addition of toilet on second floor and connection of existing lavatory to water and sewer.

Additional Proposed Plumbing (Residential)

- Replace dishwasher
- Replace kitchen faucet
- Replace existing shower stall, shower head, and controls
- Replace first-floor water closet
- Replace first-floor lavatory faucet

Additional Proposed Plumbing (Museum/Office)

- Demolish the existing first-floor toilet room and laundry room.
- Provide ADA accessible men's and women's toilet rooms on the first floor, each with one lavatory and one tank toilet. In addition, the men's room would also have a urinal. Modify the domestic water, sanitary sewer, and vent piping as required.
- Provide a janitor's closet with mop basin.

ELECTRICAL CONDITION ASSESSMENT

General Electrical

The following description of the electrical and special systems is based on field observations performed on October 30, 2017 by SWSG. The 2017 National Electric Code (NEC) has been released, but not adopted in Virginia where the 2014 code is currently in use. All code references are based on 2014 National Electrical Code (NEC).

The building is approximately 3,000 square feet and served by a 200A, 120/240V, single phase, electric distribution panel. This yields approximately 13 watts/square foot, which is adequate for the building as it presently configured. Adding air condition will require an increase in service size.

Electrical Service Entrance

Electrical power is brought to the building by an underground 200A, 120/240V, single-phase, three-wire service from a pole-mounted utility transformer at the east side of the property approximately 100 feet from the house. The underground utility feeder is connected to an electric meter on the outside corner of the building on the wall opposite the first-floor laundry room. From the meter, the utility service feeds the enclosed circuit breaker located on the building exterior next to the meter. The service cable then runs to the 200A main electric distribution panelboard located in north east corner of the basement.



Image 18: Meter and Enclosed Circuit Breaker



Image 19: Main Electrical Distribution Panelboard

The main distribution panel feeds the HVAC (240V loads), kitchen, lighting, and receptacle loads. The panelboard has no signs of visible damage and should be able to be reused.

The electrical service size will need to be increased to a 320A, 120/240V, single-phase, three-wire service if additional mechanical cooling is provided. This will require an increase in the utility service size to the house, replacement of the existing meter, and a new larger feeder

from the meter to a new 400A120/240V, single-phase, three-wire panelboard. This panelboard will supply the existing 200A panelboard, as well as the new mechanical equipment.

A ground rod is required by the NEC. It appears a conduit with ground conductor to ground rod is present. A ground wire is connected to the domestic water pipe entrance providing building ground. The ground electrode conductor will be replaced with a larger one if the service size is increased.

All of the observed branch wiring utilizes ‘Romex’ cable. The insulation on the cables, though not tested, does not appear to be damaged. Romex cable is inadequately supported in many locations in the basement. The NEC requires support every 4 1/2 feet and within 12 inches of junction boxes. MC Cable was used in the basement and noted to be inadequately supported.

Receptacles and Mechanical Equipment Circuits

In general, receptacles are present in sufficient numbers and locations to provide adequate power to the spaces. The NEC requires Ground Fault Protection (GFI) in bathrooms, garages, outdoors, kitchens, basements, and laundry areas. The NEC also requires Arc-Fault Circuit Interruption Protection (AFCI) in most other areas in a dwelling unit. Protection can be provided by individual receptacles or be provided on the branch circuit breakers supplying the receptacles. While upgrading is not code required unless building use is changed to commercial, it is recommended AFCI circuit breakers be provided when replaced.

The NEC also requires one receptacle per 12 linear feet of wall space in dwelling units, which appears to have been met in the building. Two dedicated above-counter kitchen circuits are also required by the NEC. Above counter receptacles and surface mounted ‘Wiremold’ strip is in place; dedicated circuiting was indicated on the panelboard schedules. It is recommended to replace two above-counter kitchen receptacles with GFI receptacles.



Image 20: Wiremold Strip in Kitchen



Image 21: GFI Receptacle

Most of the receptacles observed in the spaces were rated 120 Volt, 20 Amp (NEMA 5-20R). The receptacles in the space appear to be in good condition and can be reused. There were also two receptacles mounted on the basement ceiling facing the floor which is an NEC violation.

SWSG recommends moving the receptacle. Wall mounted GFI receptacles were noted in the laundry room and bath rooms.

In several rooms electric baseboard heaters are installed continuously surface mounted at walls with receptacles installed above the baseboard. This is an NEC violation. SWSG recommends either moving the receptacle or the baseboard heaters.

The NEC requires at least one GFI exterior receptacle and GFIs supplying mechanical equipment in dwelling units. One non-GFI exterior wall-mounted receptacles was noted; which does not meet code requirements. It is recommended to replace the existing exterior receptacle with a GFI receptacle. Provide GFI receptacles at exterior adjacent to proposed mechanical equipment. Provide a GFI receptacle in attic space.

There is a telephone board that does not appear to be working in the basement. Exposed telephone wiring and damaged telephone jacks were noted in the space. SWSG recommends repairing or replacing the telephone board, damaged telephone jacks and removing unused wire.

Lighting

The NEC requires a switched light fixture in every habitable room, kitchen, and bathroom. In rooms other than the kitchen and bathrooms, the requirement can be met with a switched receptacle.

Although not all light fixtures were functional (the cause was not determined) NEC requirements appear to have been met. In general, the house contains a mixture of light fixtures types. Fluorescent screw-in fixtures controlled by a light switch or pull chain were found in the basement. Recessed incandescent lights are in the hallway and stair entrance. A three-lamp incandescent ceiling-mounted fixture is in the front entrance with surface-mounted fluorescent fixtures of various styles found in some of the rooms and kitchen. Wall-mounted fixtures are in the bathroom and several of the second-floor bedrooms are provided with surface-mounted fluorescent fixtures.



Image 22: Ceiling-Mounted Light Fixture



Image 23: Surface-Mounted Fluorescent Light Fixture

Capped off conductors for exterior flood lights were noted around the exterior south face wall. One exterior wall-mounted fixture was observed on the south face of the house and it was operational. Provide exterior security lighting and switching where required. Provide light fixture in laundry room on first floor.

In general, the lighting is adequate for the space.

Life Safety

Battery-powered smoke detectors were observed throughout the building in sleeping rooms, outside each sleeping area, in the immediate vicinity of sleeping rooms, and on each story, including the basement. If the second floor is used as office space a fire alarm system will be required.

Proposed Electrical (Residential use)

- Provide AFCI replacement circuit breakers in the existing panelboard.
- Provide a new 400A120/240V, single-phase, three-wire panelboard to provide power to the following mechanical equipment as well as the existing panelboard:
 - Proposed first-floor split system air conditioning system
 - Proposed second-floor split system air conditioning system
 - Proposed two exhaust fans in bathrooms
 - Proposed attic fan
 - Proposed replacement water heater
 - Provide power for (2) ductless mini-split air conditioning systems for offices
- Install new exterior circuits in rigid metallic conduit and interior circuits in MC Cable
- Replace above-counter receptacles with GFCI receptacles. Replace exterior receptacle with GFCI receptacle.
- Provide GFI receptacles at exterior adjacent to proposed mechanical equipment.
- Salvage and reuse existing light fixtures in the basement and where possible throughout the house.
- Replace existing light fixtures in the kitchen.
- Replace or repair non-functioning light fixtures in basement (2), 1st floor (3) and 2nd floor (5).
- Install compact fluorescent or LED lamps in closet and basement porcelain screw-in lamp holders.
- Provide exterior flood lights with photocell and time clock where required for security
- Increase the size of the grounding electrode extended to ground rod near the electric meter and to the domestic water pipe entrance.
- Provide supports for inadequately supported cabling in basement.
- Provide a GFI receptacle in attic space.
- Provide light fixture in laundry room.
- Repair or replace telephone board and damaged telephone jacks.

Proposed Fire Alarm (Residential use)

- Provide a wireless interconnected smoke detector in bedrooms on the second floor that do not have one.

Proposed Electrical (Museum/Office)

- Provide a new 400A120/240V, single-phase, three-wire panelboard to provide power to the following mechanical equipment as well as the existing panelboard:
 - Proposed first-floor split system air conditioning system
 - Proposed second-floor split system air conditioning system
 - Proposed three exhaust fans in bathrooms
 - Proposed attic fan
 - Proposed replacement water heater
 - Provide power for (2) ductless mini-split air conditioning systems for offices
- Install new exterior circuits in rigid metallic conduit and interior circuits in MC Cable.
- Provide GFI receptacles at the exterior adjacent to proposed mechanical equipment.
- Replace above-counter receptacles with GFCI receptacles. Replace exterior receptacle with GFCI receptacle.
- Salvage and reuse existing light fixtures in the basement and where possible throughout the house.
- Replace existing light fixtures in existing kitchen compatible with museum use.
- Replace or repair non-functioning light fixtures in basement (2), 1st floor (3) and 2nd floor (5).
- Install surface mounted LED or fluorescent fixtures in proposed office space.
- Install compact fluorescent or LED lamps in closet and basement porcelain screw-in lamp holders.
- Provide exterior LED flood lights with photocell and time clock where required for security.
- Increase the size of the grounding electrode extended to ground rod near the electric meter and to the domestic water pipe entrance.
- Install supporting telephone and fiber service to the space as required to support the proposed conversion to office use.
- Provide supports for inadequately supported cabling in basement.
- Provide a GFI receptacle in attic space.
- Repair or replace telephone board and damaged telephone jacks.

Proposed Fire Alarm (Museum/Office)

- Provide a central station hardwired system with smoke detectors in the basement, attic and in any storage areas.
- Provide pull stations at the first floor exits.
- Provide audio visual alarms in the public and common office areas.

Opinion of Probable Cost

Ellmore Farmhouse MEP Assessment

December 1, 2017

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Project Summary		Residential Budget	Museum Budget
General Requirements (NIC)		9,300	11,800
Site Work		0	0
Concrete (NIC)		0	0
Masonry (NIC)		0	0
Metals (NIC)		0	0
Carpentry (NIC)		0	0
Thermal & Moisture Protection (NIC)		0	0
Doors & Windows (NIC)		0	0
Building Finishes (NIC)		0	0
Mechanical		42,600	66,100
Electrical		22,820	29,020
Other		0	0
	Subtotal	\$74,720	\$106,920
	GC Overhead and Profit of 15%	11,208	16,038
	Subtotal	\$85,928	\$122,958
	Contingency 30%	25,778	36,887
	Total	\$111,706	\$159,845

Notes:

1. We assume hazardous material abatement will not be required and cost for remediation of hazardous materials is not included in this ROM.
2. This estimate does not include any 3rd party inspections for potential structural work.
3. This estimate does not include any architectural or structural work that would be required to meet code for the proposed uses.
4. Potential unforeseen conditions may exist on this project that could result in varying costs to perform the scope of work outlined.
5. The museum/office scenario assumes the kitchen and laundry appliances will be removed.

Budgeted Line Items

ROM Estimate for Residential		Qty	Unit	Unit Price	Estimated Cost	Subtotals
General Requirements						
1.01	Trash Removal	1	LS	1000	1,000	
1.02	Engineering and Permitting	1	LS	7500	7,500	
1.03	Final Cleaning	1	LS	800	800	
						9,300
Site Work (NIC)						
2.01	Not in Scope					0
Concrete (NIC)						
3.01	Not in Scope					0
Masonry (NIC)						
4.01	Not in Scope					0
Metals (NIC)						
5.01	Not in Scope					0
Carpentry (NIC)						
6.01	Not in Scope					0
Thermal & Moisture Protection (NIC)						
7.01	Not in Scope					0
Doors & Windows (NIC)						
8.01	Not in Scope					0
Building Finishes (NIC)						
9.01	Not in Scope					0
Mechanical						
10.01	Demolition	1	LS	1000	1,000	
10.02	Basement dehumidifier	1	EA	850	850	
10.03	Split System HVAC	2	EA	8500	17,000	
10.04	Ductwork and grilles	1	LS	3000	3,000	
10.05	VRF HVAC System	1	EA	6500	6,500	
10.06	Hydronic Heating (Radiators)	1	LS	5000	5,000	
10.07	Duct Cleaning	1	LS	750	750	
10.08	Exhaust Fans	2	EA	500	1,000	
10.09	Attic Exhaust Fan with ductwork	1	EA	800	800	
10.10	Electric Water Heater	1	EA	950	950	
10.11	Insulation - piping	1	LS	750	750	
10.12	Make domestic water and wastewater lines code compliant	1	LS	5000	5,000	
10.13	Shower stall and shower faucet	1	LS	2500	2,500	
10.14	Water closets	2	EA	750	1,500	
10.15	Sump pump inspection	1	LS	450	450	
10.16	Clean gutters and downspouts	1	LS	500	500	
10.17	Splashblocks	6	EA	100	600	
						42,600
Electrical						
11.01	Demolition	1	LS	750	750	
11.02	Replace AFCI circuit breakers be provided in the panelboard	1	LS	25	25	
11.03	Replace above-counter receptacles with GFCI receptacles	2	EA	75	150	
11.04	Replace exterior receptacle with GFCI receptacle.	1	EA	50	50	
11.05	Provide GFI receptacles at exterior adjacent to proposed mechanical equipment	2	EA	325	650	
11.06	Provide GFI receptacle in attic space.	1	EA	325	325	
11.07	Increase electrical service and add 400A, 240/120V, 1PH, 3W panelboard	1	EA	13,500	13,500	
11.08	Support HVAC Replacements (first floor split system air conditioning system)	1	EA	850	850	
11.09	Support HVAC Replacements (second floor split system air conditioning system)	1	EA	750	750	
11.10	Support HVAC Replacements (proposed replacement gas fired water heater)	1	EA	150	150	
11.11	Support HVAC Replacements (add toilet room exhaust, wiring w/ switch)	2	EA	350	700	
11.12	Support HVAC Replacements (proposed attic fan)	1	EA	350	350	
11.13	Support HVAC Replacements (basement dehumidifier)	1	EA	450	450	

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11.14	Install compact fluorescent bulbs in closet and basement porcelain fixtures	4 EA	30	120
11.15	Install light fixture in laundry room	1 LS	200	200
11.16	Install exterior LED flood lights w/ photocell	3 EA	250	750
11.17	Photocell time clock for exterior fixtures	1 EA	100	100
11.18	Replace existing light fixtures in the kitchen	1 LS	450	450
11.19	Replace lamp or repair/replace non-functioning light fixtures in basement (2), 1st floor	10 EA	15	150
11.20	Provide Smoke detectors with AC powered type in bedrooms	1 LS	100	100
11.21	Repair or replace telephone board and damaged telephone jacks.	1 LS	400	400
11.22	Provide supports for inadequately supported cabling in basement	1 LS	350	350
11.23	Misc. Electrical	1 LS	1,500	1,500
Subtotal				22,820

74,720

Budgeted Line Items

ROM Estimate for Museum/Office		Qty	Unit	Unit Price	Estimated Cost	Subtotals
General Requirements						
1.01	Trash Removal	1	LS	1,000	1,000	
1.02	Engineering & Permitting	1	LS	10,000	10,000	
1.03	Architectural Design (Not in Scope)					
1.04	Final Cleaning	1	LS	800	800	
						11,800
Site Work (NIC)						
2.01	Not in Scope					0
Concrete (NIC)						
3.01	Not in Scope					0
Masonry (NIC)						
4.01	Not in Scope					0
Metals (NIC)						
5.01	Not in Scope					0
Carpentry (NIC)						
6.01	Not in Scope					0
Thermal & Moisture Protection (NIC)						
7.01	Not in Scope					0
Doors & Windows						
8.01	Not in Scope					0
Building Finishes						
9.01	Not in Scope					0
Mechanical						
10.01	Demolition	1	LS	2,500	2,500	
10.02	Basement dehumidifier	1	EA	850	850	
10.03	Split System HVAC	2	EA	10,000	20,000	
10.04	Ductwork, grilles, diffusers	1	LS	3,500	3,500	
10.05	VRF HVAC System	1	EA	6,500	6,500	
10.06	Hydronic Heating (Radiators)	1	LS	5,000	5,000	
10.07	Duct Cleaning	1	LS	750	750	
10.08	Exhaust Fans	3	EA	500	1,500	
10.09	Attic Exhaust Fan with ductwork	1	EA	800	800	
10.10	Electric Water Heater	1	EA	950	950	
10.11	Insulation - piping	1	LS	750	750	
10.12	Make domestic water and wastewater lines code compliant	1	LS	5,000	5,000	
10.13	Sanitary Sewer	1	LS	2,000	2,000	
10.14	Domestic water piping	1	LS	1,500	1,500	
10.15	Vent piping	1	LS	1,000	1,000	
10.16	Lavatory sinks, faucets	3	EA	1,500	4,500	
10.17	Dishwasher	1	EA	800	800	
10.18	Kitchen sink, faucet	1	EA	800	800	
10.19	Water closets	3	EA	750	2,250	
10.20	Urinal	1	EA	1,250	1,250	
10.21	Mop basin	1	EA	850	850	
10.22	Drinking fountain	2	EA	750	1,500	
10.23	Sump pump inspection	1	LS	450	450	
10.24	Clean gutters and downspouts	1	LS	500	500	
10.25	Splashblocks	6	EA	100	600	
						66,100
Electrical						
11.01	Demolition	1	LS	1,000	1,000	
11.02	Replace AFCI circuit breakers be provided in the panelboard	1	LS	25	25	
11.03	Replace above-counter receptacles with GFCI receptacles	2	EA	75	150	
11.04	Replace exterior receptacle with GFCI receptacle.	1	EA	50	50	

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Herndon, Virginia 20170

11.05	Provide GFI receptacles at exterior adjacent to proposed mechanical equipment	2 EA	325	650
11.06	Provide GFI receptacle in attic space.	1 EA	325	325
11.07	Increase electrical service and add 400A, 240/120V, 1PH, 3W panelboard	1 EA	13,500	13,500
11.08	Support HVAC Replacements (first floor split system air conditioning system)	1 EA	650	650
11.09	Support HVAC Replacements (second floor split system air conditioning system)	1 EA	750	750
11.10	Support HVAC Replacements (ductless split air condition system for offices)	2 EA	650	1,300
11.11	Support HVAC Replacements (proposed replacement gas fired water heater)	1 EA	150	150
11.12	Support HVAC Replacements (add toilet room exhaust, wiring w/ switch)	3 EA	350	1,050
11.13	Support HVAC Replacements (proposed attic fan)	1 EA	350	350
11.14	Support HVAC Replacements (basement dehumidifier)	1 EA	450	450
11.15	Install LED or compact fluorescent bulbs in closet and basement porcelain fixtures	4 EA	30	120
11.16	Install light fixture in laundry room	1 LS	200	200
11.17	Install exterior LED flood lights w/ photocell	3 EA	250	750
11.18	Photocell time clock for exterior fixtures	1 EA	250	250
11.19	Replace existing light fixtures for museum use	1 LS	500	500
	Replace lamp or repair/replace non-functioning light fixtures in basement (2), 1st floor (3) and 2nd floor (5)	10 EA	50	500
11.21	Provide Smoke detectors with AC powered type in bedrooms	1 LS	100	100
11.22	Repair or replace telephone board and damaged telephone jacks.	1 LS	400	400
11.23	Install supporting telephone and fiber service to the space as required to support the p	1 LS	500	500
11.24	Provide supports for inadequately supported cabling in basement	1 LS	350	350
11.25	Central station with hardwired smoke detectors in basement, attic, storage areas	1 LS	1,200	1,200
11.26	Pull stations at first floor exits	2 EA	250	500
11.27	A/V alarms in the public and office areas	7 EA	250	1,750
11.28	Misc. Electrical	1 LS	1,500	1,500

29,020

Subtotal

106,920