



FAIRFAX COUNTY PARK AUTHORITY
Hannah P. Clark/ Enyedi House
MEP Assessment

10605 Furnace Road
Lorton, VA 22079



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INTRODUCTION

The Fairfax County Park Authority is evaluating the Clark-Enyedi house for the Resident Curator program. The Clark-Enyedi house is located at 10605 Furnace Road in Lorton. 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 are based on the building remaining a residential use.

An Opinion of Probable Cost is provided for correcting the deficiencies. 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.

MECHANICAL CONDITION ASSESSMENT

Existing Mechanical System

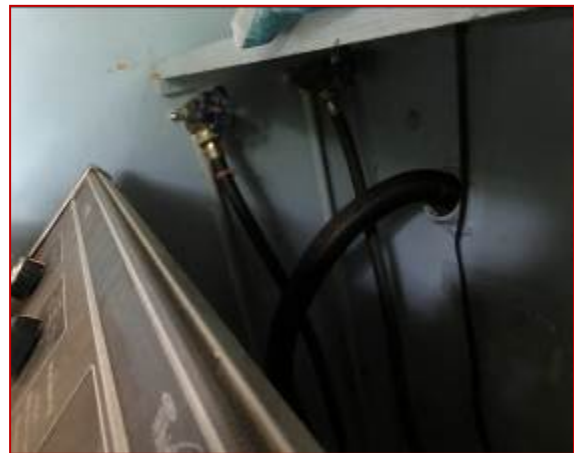
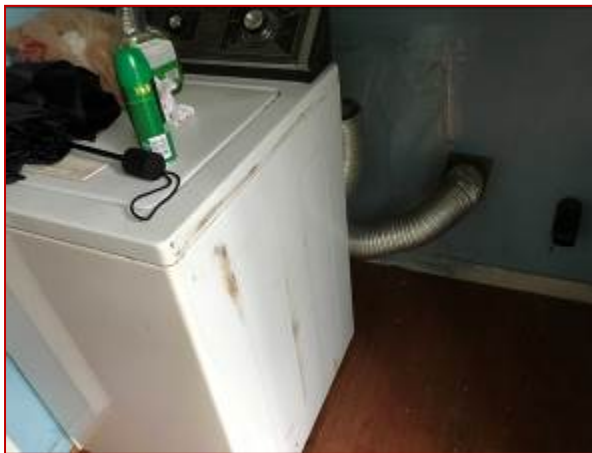
The house is conditioned by a single nominal 36 MBH (3 ton) Trane XE 1000 split system outdoor heat pump located at the left side of the house that is connected to a Rheem furnace with an Aprilaire 110 humidifier located on the first floor near the family room. This system was installed in October 2000. A wall-mounted dial-type mechanical thermostat is located in the first floor living room area. Wall and floor supply registers distribute air to each space and appear to be in fair condition. The wall-mounted return grille is located in the living room. The system is operational and the thermostat was set at 75F. The heat pump and furnace are past their useful life timeframes.







There is a clothes washer, however there is not a clothes dryer. Vent ductwork with wall hood and power outlet are available for an electric clothes dryer.



Proposed Mechanical

- Remove and replace existing HVAC system (outdoor unit, indoor furnace, humidifier, and thermostat).
- Clean and inspect all existing supply and return ductwork and registers/grilles.
- Provide an exhaust fan for all the bathrooms.
- Replace kitchen hood as it was not working during inspection.
- Provide a dehumidifier for the basement.

Existing Plumbing System

Domestic water is provided to the house by a waterline connected to a well. The pressure tank and filtration system are located in the basement along with a 40 gallon gas-fired water heater and a sump pump. The water heater age is unknown. It is unknown if the sump pump is operational. The domestic water piping consists of PVC at the well equipment and copper throughout the house. The domestic water piping is not insulated.



All of the faucets and water closets in each of the 1-1/2 bathrooms were operational. There are two hose bibbs located on the exterior wall of the house. The kitchen sink does not have a garbage disposer because the house is served by a septic system. All of the toilet bowls and one sink lavatory on the second floor bathroom have severe water stains.







Proposed Plumbing

- Insulate exposed domestic hot and cold water piping.
- Replace all bathroom faucets.
- Provide new clothes dryer.
- Replace all of the water closets.
- Replace the shower and bathtub controls and the shower heads.
- Clean gutters and downspouts to verify they are clear.
- Provide splash blocks at all downspouts.
- Inspect the septic system by a septic company.
- Inspect the well water system by a plumbing contractor.
- Test the well water to verify the safety and correct water treatment.

ELECTRICAL CONDITION ASSESSMENT

General Electrical.

The Clark-Enyedi house is approximately 1,300 square feet and served by a 60A main, 120/240V, single phase, electric distribution panel. This yields approximately 7 watts/square foot, which is border line adequate for a residential building.

Electrical Service Entrance

Electrical power is brought to the house by an overhead 120/240V, single-phase, three-wire service connecting to a an electric meter located on the outside corner of the work room. The work room is adjacent to the stairs. From the meter, the utility service feeds a 60A main electric distribution panel located on the north face wall of the stair landing leading to second floor.



The panelboard feeds the HVAC/Furnace (two pole loads), kitchen, and other building receptacle loads. The cables and conduits connected to the panelboard are not visible and their condition needs to be assessed. The telephone company entrance box location was not found. The panelboard, which appears to be dated from the 1980s, is nearing the end of its useful life and should be replaced. It is recommended to upgrade the existing panelboard with a 100A main 120/240V panelboard to provide capacity for required dedicated kitchen receptacles and other added loads.

Receptacles and Mechanical Equipment Circuits

In general, receptacles are present in sufficient numbers and locations to provide adequate power to the spaces. The 2017 National Electric Code (NEC) has been released, but not adopted in Virginia where the 2014 code is currently in use. 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, it is recommended to provide GFI and AFCI circuit breakers in the panelboards that are recommended for replacement.



The NEC also requires one receptacle per 12 linear feet of wall space, which has not been strictly met in the building. Dedicated kitchen circuits are also now required by the NEC as well a minimum of two dedicated above-counter receptacles. The above counter receptacles are in place; however, dedicated circuiting was not indicated on the panelboard schedules. While upgrading is not code required, it is recommended to provide two above-counter receptacles with dedicated circuits in the kitchen. It is also recommended to replace two additional above-counter kitchen receptacles with GFCI receptacles.

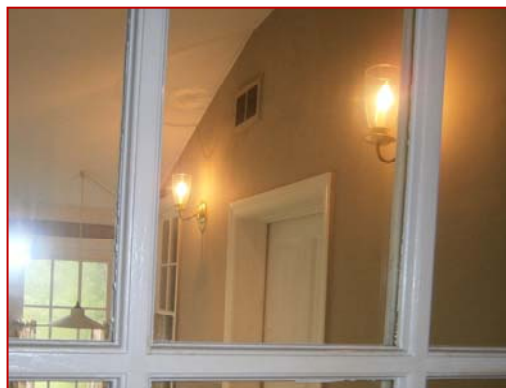
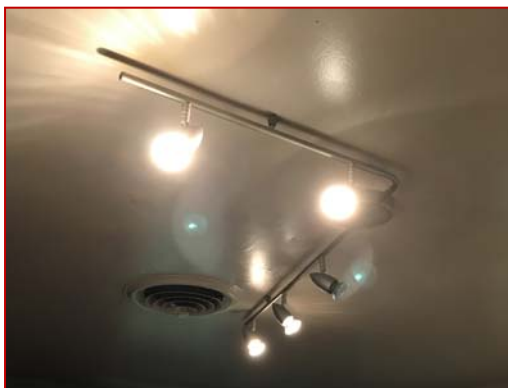
Ceiling and high wall-mounted receptacles were observed in the kitchen and second-floor hallway. There are also two exterior wall-mounted receptacles. The receptacles are sufficient except for one non-grounded receptacle found in the kitchen that should be replaced.

Disconnecting means for mechanical equipment appeared sufficient and in good repair.

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 meet.

Wall sconces are used in the sunroom and bathrooms with overhead light fixtures found in the laundry, living, bedrooms, and workrooms. Track lights are used in the kitchen, living room and one bedroom.



Two exterior flood lights and the exterior lighting for the main dwelling front and rear entrances were observed to be non-functioning; however, it is unknown if this is due to non-functioning light bulbs or the fixtures themselves. One exterior wall-mounted fixture was observed on the south face of the house and it was operational.

Life Safety

Battery powered smoke detectors were observed throughout the building; however, they are not located in all of the recommended locations. They do not conform to current Fairfax County recommendations.

Proposed Electrical

- Replace (1) 100A 120/240V panelboard in stair landing with GFI and AFCI circuit breakers.
- Replace non-functioning light fixtures.
- Replace non-grounded receptacle.
- Replace four above-counter receptacles with GFCI receptacles. Provide two of these receptacles with dedicated circuits.
- Replace smoke detectors. Fairfax County recommends installing smoke detectors in each sleeping room, outside each sleeping area and in the immediate vicinity of sleeping rooms, and on each story, including the basement. Recommend installing wireless interconnected building-powered smoke detectors with battery back-up in lieu of battery powered only smoke detectors.
- Feeders to HVAC may be reused if sized correctly for the proposed equipment.
- Provide power for proposed dehumidifier in basement.
- Add GFCI receptacles in toilet rooms off the main bedrooms.

Clark-Enyedi House

Opinion of Probable Construction Cost

	SWSG Estimate
Division 1 - General Requirements	2,500
Division 2 - Site Work	0
Division 3 - Concrete	0
Division 4 - Masonry	0
Division 5 - Metals	0
Division 6 - Carpentry	0
Division 7 - Thermal & Moisture Protection	0
Division 8 - Doors & Windows	0
Division 9 - Building Finishes	2,000
Division 10 - Specialties	0
Division 11 - Equipment	0
Division 12 - Furnishings	0
Division 13 - Special Construction	0
Division 14 - Conveying Systems	0
Division 15 - Mechanical	15,200
Division 16 - Electrical	9,280
Subcontracted Construction Cost	28,980
GC Overhead	10.0% 2,898
GC Profit	10.0% 3,188
Other	0
Other	0
Other	0
Other	0
Contingency	15% 5,260
Estimated Project Cost	\$40,326

Notes:

1. Excludes hazardous materials testing and abatement
2. Excludes general contractor

Budget Estimate

Category/Trade		Qty	Unit	Unit Price	Estimated Cost	Subtotals
Division 1 - General Requirements						
1.01	Closeout Documents	1	LS	500.0	500	
1.02	Trash Removal	1	LS	1,000.0	1,000	
1.03	Temporary Protection	1	LS	500.0	500	
1.04	Permits	1	LS	500.0	500	
						2,500
Division 2 - Site Work						
2.01			SF	0.0	0	0
Division 3 - Concrete						
3.01			SF	0.0	0	0
Division 4 - Masonry						
4.01			LS	0.0	0	0
Division 5 - Metals						
5.01			EA	0.0	0	0
Division 6 - Carpentry						
6.01			LF	0.0	0	0
Division 7 - Thermal & Moisture Protection						
7.01			SF	0.0	0	0
Division 8 - Doors & Windows						
8.01			EA	0.0	0	0
Division 9 - Building Finishes						
9.01	Miscellaneous Drywall repair/painting for installing circuits	1	LS	2,000.0	2,000	2,000
Division 10 - Specialties						
10.01			LS	0.0	0	0
Division 11 - Equipment						
11.01			LS	0.0	0	0
Division 12 - Furnishings						
12.01			LS	0.0	0	0
Division 13 - Special Construction						
13.01			LS	0.0	0	0
Division 14 - Conveying Systems						
14.01			LS	0.0	0	0
Division 15 - Mechanical						
15.01	Demolition	1	LS	500.0	500	
15.02	HVAC system	1	LS	6,500.0	6,500	
15.03	Toilet exhaust fans	3	EA	350.0	1,050	
15.04	Duct cleaning	1	LS	750.0	750	
15.05	Range hood	1	LS	500.0	500	
15.06	Basement dehumidifier	1	EA	500.0	500	
15.07	Insulation - piping	1	LS	750.0	750	
15.08	Kitchen sink faucet	1	EA	350.0	350	
15.09	Clothes dryer	1	LS	1,500.0	1,500	
15.10	Lavatory faucets	2	EA	200.0	400	
15.11	Bathtub/shower faucets	1	EA	600.0	600	
15.12	Toilets	2	EA	75.0	150	
15.13	Clean gutters and downspouts	1	LS	250.0	250	
15.14	Splashblocks	1	LS	250.0	250	
15.15	Septic system inspection	1	LS	450.0	450	
15.16	Well water system inspection	1	LS	350.0	350	
15.17	Water testing and treatment	1	LS	350.0	350	
						15,200
Division 16 - Electrical						
16.01	Demolition	1	LS	250.0	250	
16.02	100A, 120/240V 1-phase panelboard + GFI/AFCI CBs	1	EA	1,000.0	1,000	
16.03	Light Fixture Replacement	6	EA	250.0	1,500	
16.04	Toilet Room Receptacles GFCI	2	EA	325.0	650	
16.05	Replace receptacle with grounded type	1	EA	30.0	30	
16.06	Replace Smoke detectors with AC powered type	6	EA	100.0	600	

16.07	Support HVAC replacements	1	LS	2,500.0	2,500
16.08	Add toilet room exhaust, wiring w/ switch	2	EA	300.0	600
16.09	Add power for dehumidifier	1	EA	500.0	500
16.10	Dedicated circuits in kitchen	2	EA	500.0	1,000
16.11	Kitchen GFCI receptables	4	EA	50.0	200
16.12	Lamp replacement	3	EA	150.0	450

9,280

Estimated Construction Costs**28,980**