

TREATMENT PLAN

INTRODUCTION

Ellmore Farmhouse is significant due to its association with dairy farming and as the residence of Fairfax County Board of Supervisor member William H. Ellmore. The Period of Significance is 1891 to 1954, when the property was likely no longer used by the owners as a dairy farm.

The treatment plan for the house involves rehabilitating the interior from mixed residential and office use to solely office use. The exterior shall be restored to the period of significance, though due to funding constraints, this effort may be performed in phases.

A structural analysis of each room in the house was performed to determine the bearing capacity. Many of the spaces do not have the capacity to serve their present function. Where feasible, additional supports are recommended to permit use of the room. The Structural Condition Assessment and Treatment Plan portion of this chapter identifies allowable room use based on structural capacity.

ARCHITECTURAL CONDITION ASSESSMENT AND TREATMENT PLAN

The major scope of work items involved in restoring the exterior include: removal of the aluminum siding, removal of the front brick masonry stair, stoop, front entry vestibule, and brick masonry planters against the front wall of the house. In addition the rear stair enclosure and back porch shall also be removed. The front of the farmhouse shall be restored by constructing a porch based on the earliest available historical photos. (Refer to appendix A.)

Exterior

Issue: Sometime after World War II, aluminum siding was installed over the original wood clapboard siding. This changed the character of the house by reducing the profile of the existing trim and diminishing the impact of reveals and setbacks. Consideration was given to the fact that the aluminum siding may have been applied to the building in its history; however, the aluminum siding prevents the inspection of the concealed wood, potentially allowing wood rot to worsen. Therefore, the recommended treatment involves removal of the aluminum siding. In addition, the exterior aluminum siding has some deterioration in the form of dents and broken areas.

Completed Recommendations: Carefully remove the aluminum siding, plastic shutters, insulation boards, and any furring strips used to attached the aluminum siding to the house. After removing the aluminum siding, and associated components like wood blocking and styrofoam insulation that may be attached to the exterior wood siding with adhesive. inspect the house for wood deterioration. Repair wood components when feasible, including puttying holes caused by attachment of the siding. Replace components when repair is not feasible or when missing using similar materials

and design.

Repair and/or replace deteriorated and missing wood components of the windows with similar wood components. Construct replacement components based on similar features from the same period. In other words, use woodwork from the addition to model replacements for deteriorated window components in the addition, and use woodwork from the original portion of the house to model replacements in that portion of the house.

Remove any mildew from any remaining components of the house using a solution of one cup non-ammoniated detergent, one quart household bleach, and one gallon water. Scrub affected surfaces with a medium-soft brush. For particularly stubborn areas, an additional quart of bleach may be added. After removal of any mildew, rinse the areas with a direct stream of water, and allow to dry thoroughly. Repaint these areas with a “mildew-resistant” primer and finish coat.

Since the existing paint on the wood siding is most likely peeling due to its age, remove all loose paint with a nylon brush. Feather out the transition between remaining paint and bare wood using a chemical paint blender. Do not use sandblasting, rotary sanders and strippers, or blow torches. The paint was not tested for the presence of lead; however, lead-based paints are likely present. New painting shall include one coat of oil-base primer with two coats of acrylic paint as the finish surface. paint shall be a white color to match. Apply caulk around windows, doors, and other penetrations.

Issue: The front entry vestibule, brick stoop and steps at the vestibule, and the brick planters against the front wall of the house are not the original building components. These components were built late in the history of the house, therefore not bearing any historic significance. The original front porch was removed in order to built these components.

Completed Recommendations: As part of the restoration of the historically-significant components of the original building, it is recommended to demolish the existing front entry vestibule, brick stoop and steps at the vestibule, and brick planters against front wall of the house and construct a new front porch utilizing building materials to match the original.

The front porch shall extend almost the full width of the house. The wood posts shall be chamfered for a portion of the length of the posts. Decorative wood brackets shall be installed at the top of the posts. The floor of the porch shall be wood, and the crawlspace enclosed with lattice. Three wood steps shall lead up to the porch. The porch roof shall be clad with a standing-seam metal roof.

The existing standing-seam metal roof was not installed using traditional construction methods. Consider replacing the roof with a standing-seam metal roof that has been crimped at the ridge rather than installed with a cap.

Issue: The stair with an enclosure attached to the side of the house was part of the second major addition when the second floor of the house was used as an office occupancy and the first floor remained as residential. The proposed new use for the entire house will be office use. The gross floor area for the first and the second floor (each) is approximately 1,515 S.F. Therefore the occupant load for each level will be approximately 16 persons per floor. The exit access travel distance from the most remote place at the second floor of the house to bottom of the new stair at proposed new porch in front of the house is approximately 74 feet.

Completed Recommendations: Consider the following two options:

1. Keep the original open stair inside the house and provide an enclosure with a 1-hour fire rated assembly. Remove the existing second stair attached to the side of the house. Maintain the existing stair to cellar area.
2. Restore the original open stair inside the house and modify the second stair on the side of the house by removing the projected section of the stair from the side of the house and constructing a second open stair terminating inside the house near the rear entrance to the house. By providing two stairs the occupant load of 16 persons would be divided into 8 persons per each stair. Since each stairway serves an occupant load of less than 10 and do not serve more than two floors then they can be open stairways. (IBC 2006 Section 1020.1 Exception 1.)

Issue: The covered porch at the rear of the house was added after the Period of Significance.

Completed Recommendations: Remove the existing covered rear porch. Build a new smaller wood deck with accessible wood ramp down to the existing concrete sidewalk in order to provide an accessible entrance on the rear of the house.

Issue: Single-pane glass sash windows at the first-floor living room do not match windows from the Period of Significance, which had two lites over two lites.

Completed Recommendations: Replace the living room window sashes with sash to match the other windows in the original section of the house.

Issue: Lack of crawl space vents.

Completed Recommendations: install two operable load bearing metal vents in the foundation wall on the front side of the original house, one within 3 feet of the each corner. Install one on the east and west walls of the crawl space within 3 feet of the corner from the rear side of the house.

Issue: Broken window screens.

Completed Recommendations: Repair or replace as required those windows with broken or

damaged screens.

Interior

Issue: Deteriorated crawl space insulation.

Recommendations: Replace all crawl space batt insulation with new (6" R-19) batt insulation with supporting plastic mesh attached to underside of first floor wood timber joists.

Issue: Lack of crawl space vapor barrier.

Recommendations: Install 6 mil polyethylene vapor barrier on top of exposed grade and cover vapor barrier with minimum 2" thick pea gravel.

Issue: If the option of enclosing the original open stair is chosen, then it will have to include a vestibule at the new front entry door at the termination of the stair enclosure.

Recommendations: Maintain existing stair enclosure at second floor including the exit door (Minimum requirement of 1 hour fire-rated assembly of such enclosure to be verified in the field). New 1 hour fire rated enclosure to be constructed around the same stair at the first floor with a vestibule at the front entry. The rooms on both sides of the existing original stair would be accessed from the same vestibule.

Issue: If the option of providing two open stairways is chosen, then the existing second stairway would need to be modified by reconstructing it to terminate inside the house near the rear entrance to the house. The stair to the cellar area would have to be modified and rebuilt to terminate next to stair from the second floor.

Recommendations: Remove the existing enclosure around the original stair opening at the second floor. Remove the existing projected section of the stairway on the side of the house. Rebuild the stair by continuing it from second floor on interior side of the house and terminate at first floor in the area where the existing stair to cellar area is located now. The existing cellar stair would need to be modified as well and the access door to be next to the stair from second floor.

Issue: Damaged ceiling in Bedroom 201.

Recommendations: Patch and finish existing damaged area of ceiling in Bedroom 201 to match adjacent area.

Issue: Damaged wall in closet 205.

Recommendations: Patch holes and damaged areas of the wall in Closet 205.

Issue: Dislocated wood base and hole in the wall at Bedroom 202.

Recommendations: Reinstall dislocated wood base and patch wall hole in Bedroom 202.

Issue: Damaged ceiling in the closet of Office 209.

Recommendations: Replace damaged ceiling area in the closet of second floor Office 209 with like material.

Issue: Non-functional second floor Toilet Room 211.

Recommendations: Remove vanity top, base cabinet, mirror on wall and toilet accessories in addition to capping toilet drain pipe and patching floor in second floor toilet room 211. install carpeting and a closet shelf.

Issue: Damaged wall finish in closet of Bedroom 203.

Recommendations: patch damaged wall paper cover and paint to match adjacent surface on wall of the closet in Bedroom 203.

Issue: Unfinished gypsum wallboard covered ceiling at Hallway outside of Office 209.

Recommendations: Patch, spackle, finish and install ceiling molding at existing gypsum wallboard ceiling to match adjacent surface at Hallway outside of Office 209.

Issue: Deteriorated attic insulation.

Recommendations: Replace all blown type attic insulation with (9" R-30) batt type insulation throughout the attic space.

Issue: Roof leak near gable end wall on east side of original section of the house.

Recommendations: Locate the roof leak and fix the same. Repair the damaged areas of the attic as needed due to roof leakage.

Issue: Uncovering the centered gable wall louver from attic side.

Recommendations: Remove the insulation board from the back side of the louver on centered gable wall accessible from the attic space subsequent to removal of the aluminum siding from the exterior side of the building. See mechanical treatment report for installation of exhaust fan on attic side of the attic louvers.

Issue: Unscreened louvers at the attic.

Recommendations: Install new bird screens on interior side of all louvers at the attic space.

Issue: Mechanical equipment support framing in attic space.

Recommendations: Install framing to support new mechanical equipment on top of 2nd floor ceiling joists in the attic space without damaging new batt insulation.

Issue: Abandoned old double Light switches on closet 207 wall have no cover plate.

Recommendations: Cover the abandoned old recessed double electric light switches with clear acrylic shielding cover.

Issue: The repairs will warrant painting the whole house.

Recommendations: Subsequent to implementation of all recommendations for issues discussed in this report and other minor repairs and patching of surfaces not specifically mentioned in the treatment report, paint all interior spaces of the house.

ADA ACCESSIBILITY

Issue: Providing ADA accessible route to primary function areas.

Recommendations: Remove existing wall and door into the first floor room with fireplace in rear of the house in order to build a new ADA accessible ramp in the vestibule area near the rear entrance. The ramp shall connect the rear vestibule with the existing family room space that is at a higher elevation.

Issue: Alteration of existing Kitchen area to suit proposed new Office use and ADA accessibility requirements.

Recommendations: Remove existing center island next to flue chimney. Remove the counter areas with base and wall cabinets next to the chimney flue and along the window wall. The remaining existing sink, counter, and cabinets in the kitchen shall be replaced or altered as required in order to be made ADA accessible.

Issue: Alteration of existing laundry room and bathroom to accommodate proposed new Office use and ADA accessibility requirements.

Recommendations: Demolish existing laundry room and bathroom. Build new Men's and Women's Toilet rooms in addition to building a janitor closet and installing new drinking fountains outside of the toilet room walls.

STRUCTURAL CONDITION ASSESSMENT AND TREATMENT PLAN

Crawl Space Shoring Walls

Issue: The first-floor joist framing in the front two rooms and front hallway have been shored with three combination timber and stone shoring walls. Two of the walls are parallel to the front of the house and the third wall is perpendicular to the front of the house.

The walls consist of two horizontal continuous beams, vertical timbers between the two beams, and stone piers below the bottom beam. It appears these were added after original construction, possibly to stiffen up an otherwise bouncy and sagging floor system. The shoring walls are potentially unstable because the timbers are not securely fastened to each other and the stones, which are placed loosely without mortar, are stacked up to three pieces high.

Recommendations: Add stabilization bracing to the shoring walls to be located at each stone pier. The stabilization framing will include four horizontal 2x4's secured to the existing vertical posts, two vertical 2x6's fastened to the new 2x4's, and blocking between the vertical members and the existing stone support piers to prevent roll-over, tilting, or buckling of the shoring walls. Refer to Details 6 to 9/S2 of the Design Development plans for more information.

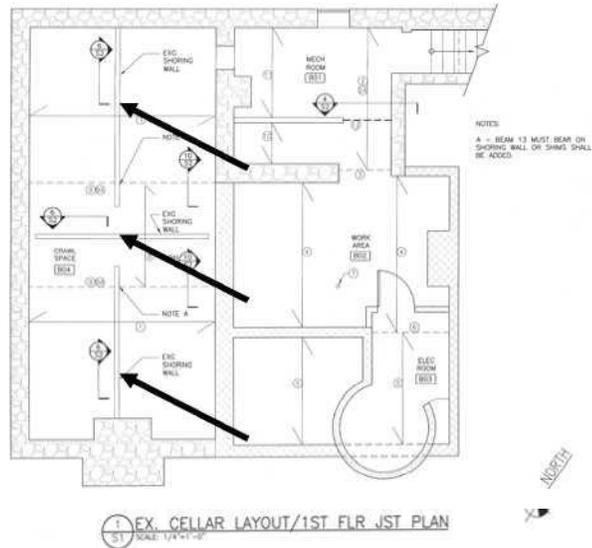


Image 4.1: Crawl Space Shoring Walls

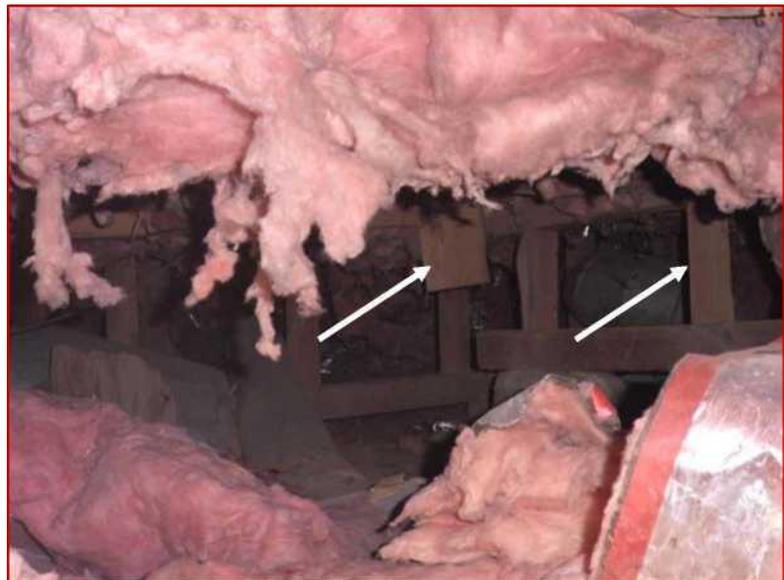


Image 4.2: Crawl Space Shoring Walls

1st Floor Joist Headers below Main Stairs

Issue: On the first floor below the stairs (between the dashed lines indicated by Arrow 1 in the sketch below) the joist framing (direction indicated by Arrow 2) is parallel to the front of the house, and is comprised of dimensional lumber. This area is between the two front rooms that have round logs as floor joists that run perpendicular to the front of the house.

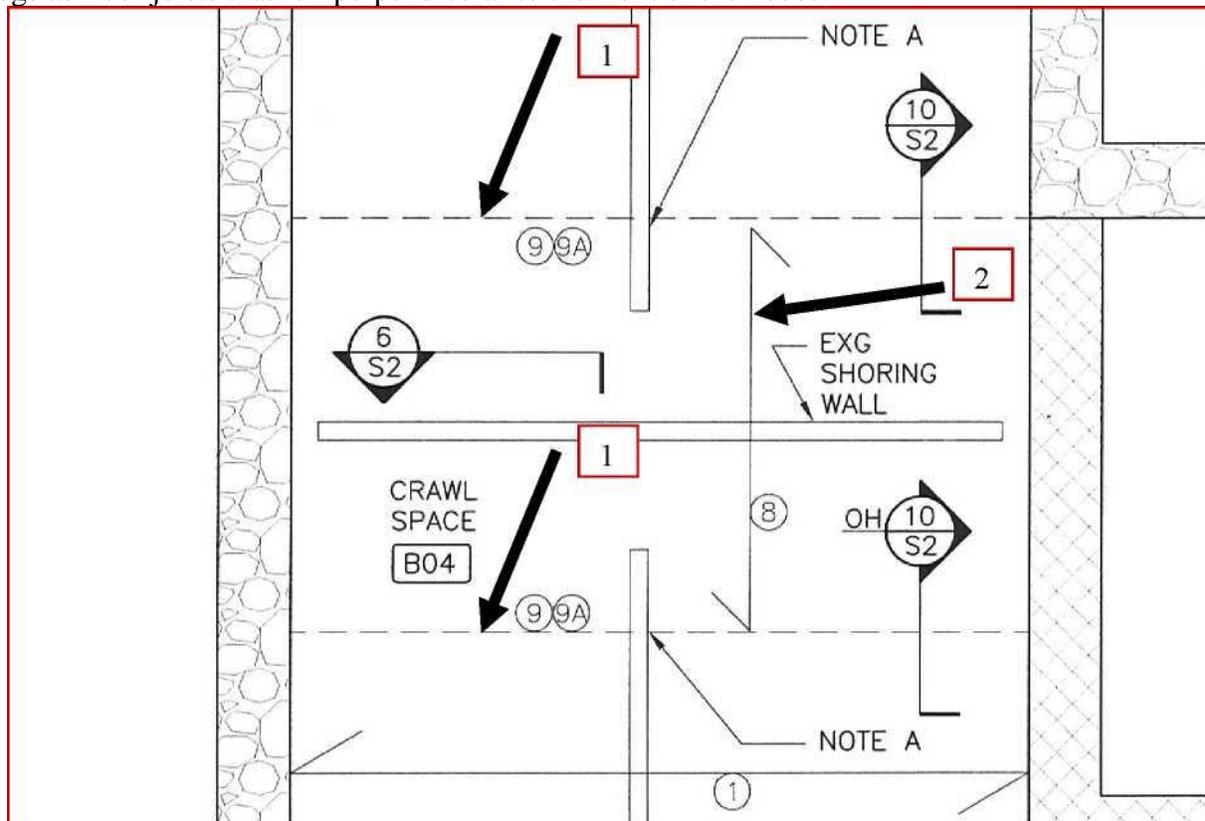


Image 4.3: First Floor Joist Headers

The dimensional lumber joists are 2x6's and are supported at their mid-points by the shoring wall that is perpendicular to the front of the house. They are adequate in size, but are attached at their ends to single 2x6 headers (at the Arrow 1's) that are severely undersized.

Recommendations: The single header members shall be doubled in size and shall be provided with solid blocking at their mid-points so as to bear on the shoring walls that are parallel to the front of the house.

Rear Floor Joists Below Kitchen

Issue: There are 2x6 joists under the rear area of the kitchen that are undersized because a bearing wall that bisects the joists at the front of the kitchen does not extend all the way back to the rear of the kitchen. The undersized joists are indicated by the number 2 in a circle in the sketch below.



Image 4.4: Rear Joists Below Kitchen

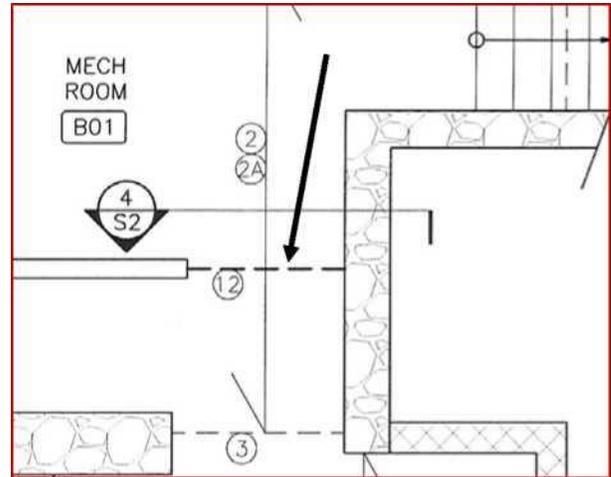


Image 4.5: Rear Joists Below Kitchen

Recommendations: A beam shall be added at the end of the bearing wall so the joists do not have to span their full length without any intermediate supports. The beam shall be supported by jack studs and king studs at each end. The required location of the posts and beam are indicated by the dashed lines in the photo above at the left.

2nd Floor Joists Below Front Bedrooms & Hall

Issue: The joists under Bedrooms 201 and 202 are undersized for code-required loads for office use and they are also undersized for the required loads for use as bedrooms.

Recommendations: No repairs are to be performed to this area at this time. Therefore, the areas shall not be used for office. Existing items stored in these rooms shall be removed and the rooms shall not be used for light storage.

see sketch next page. The area within the dashed line shall not be used for office or storage.

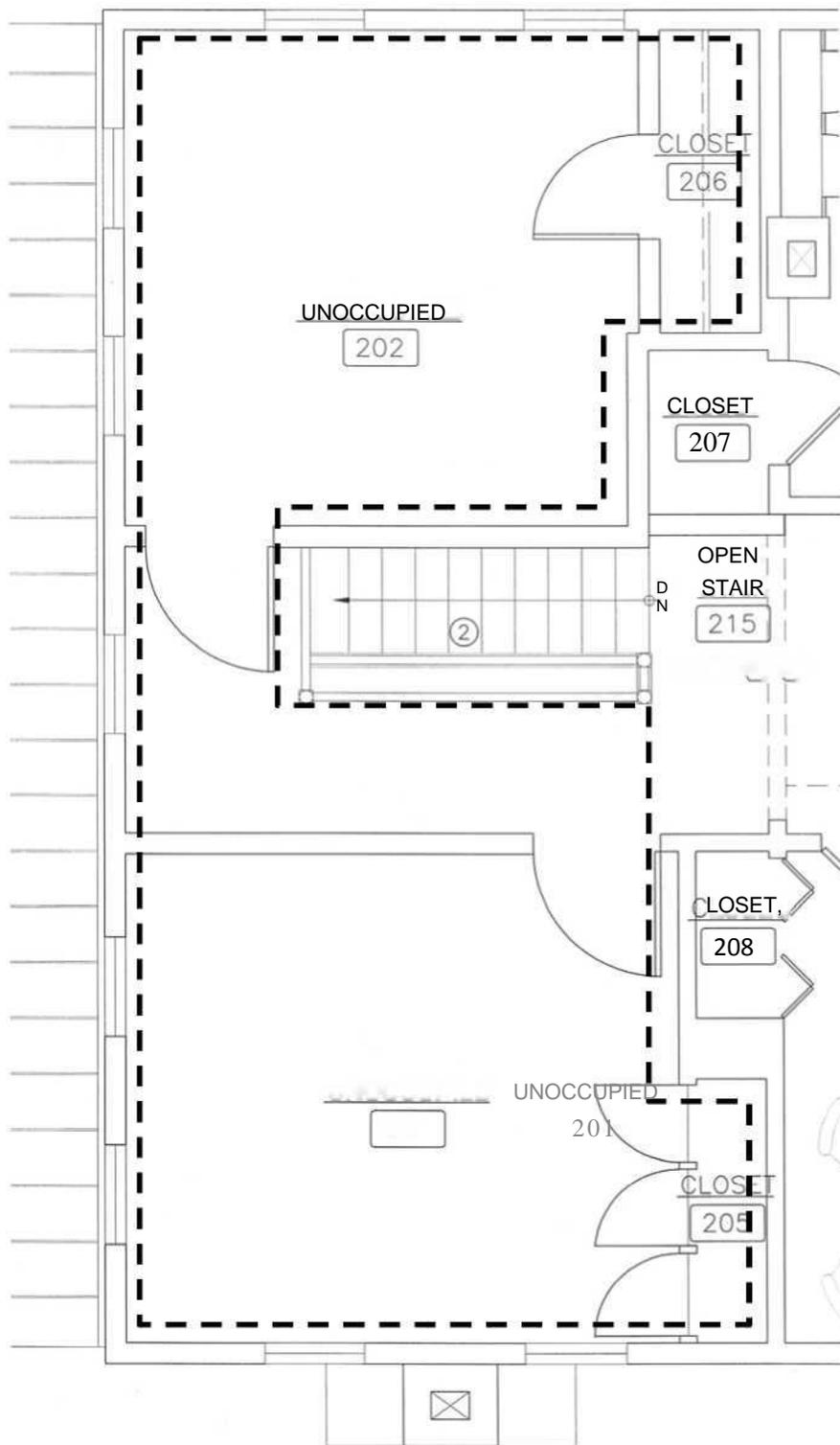


Image 4.6: Second Floor Joists Below Front Bedrooms Are Inadequate

2nd Floor Joists Below Central Hall

Issue: The second-floor joist framing above the family room spans over 16'-0" and is oriented from the front to the back of the house. It is not sufficient to carry the proposed office

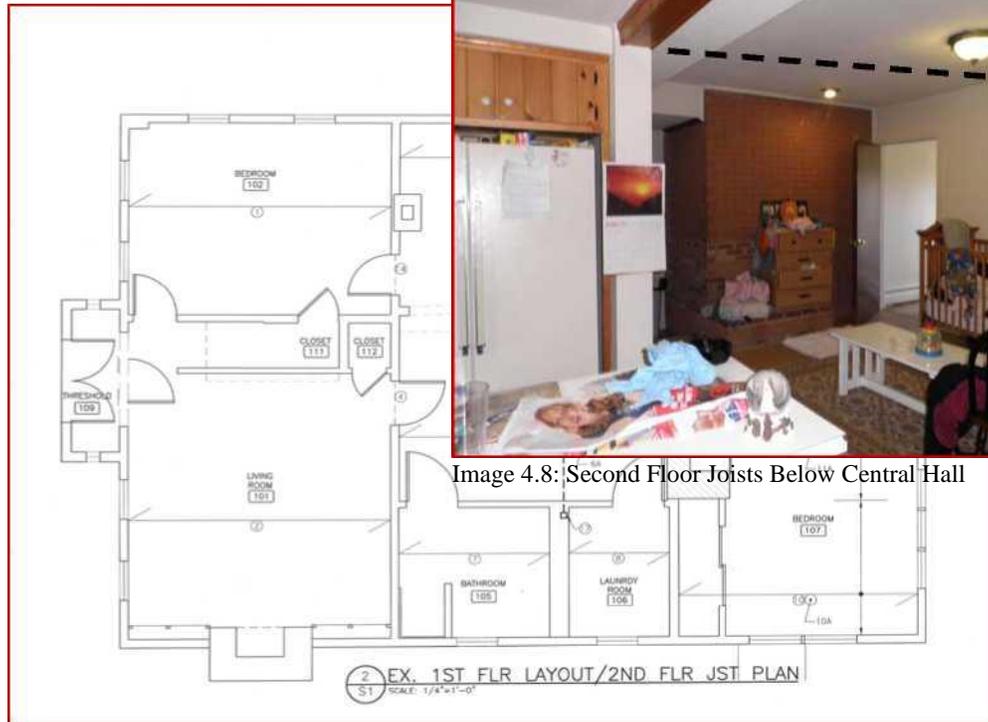


Image 4.8: Second Floor Joists Below Central Hall

Image 4.7: Second-Floor Joists Below Central Hall

loads of 50 pounds per square foot.

Recommendations: Add a beam below the joists that will span from the demising wall at the kitchen to the wall near the bathroom and Laundry Room. Refer to item 16 in the sketch above for the required location of the beam. The beam size shall follow the recommendations in the design development drawings in the Framing Table at Detail 5/S1. See dashed line in photo to the left for proposed location.

Attic Floor Joists Above Front Bedrooms

Issue: The attic floor joists above Bedrooms 201 and 202 are not adequate to carry storage loads.

Recommendations: Repair of the attic floor joists is not within the scope of this project at this time so no storage items shall be placed in the attic. There are presently no items stored in the attic so removal of attic items is not required.

Roof Rafters Above Front Bedroom 202



Image 4.9: Roof Rafters Above Bedroom 202

Issue: The rafters above Bedroom 202 have vertical support studs toward the rear side of the house (Arrow 1) but do not have vertical support studs at the front side of the house.

Recommendations: Vertical supports studs as indicated by Arrow 1 shall be added to the rafters toward the front side of the house above Bedroom 202.

Storage Loads

Issue: Areas of the house that are not being used as offices are proposed to be used for storage. The building code requires a floor strength for live loads of 125 psf for light storage (files, shelving, boxes).

Recommendations: The area above the Laundry Room is rated for 153 psf and may be used for storage. The slab on grade areas of the first-floor (Bedroom 107 and Vestibule Room 108) may be used for storage.

MECHANICAL CONDITION ASSESSMENT AND TREATMENT PLAN

Mechanical System

The house is heated by an oil-fired hydronic boiler located in the basement. The nameplate information is illegible. 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, and there is significant surface rust on the casing. 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 new gas meter was recently installed and flexible cssT gas piping has been extended into the basement and capped near the existing boiler.

Heating water is pumped through uninsulated copper piping throughout the house to floor-mounted

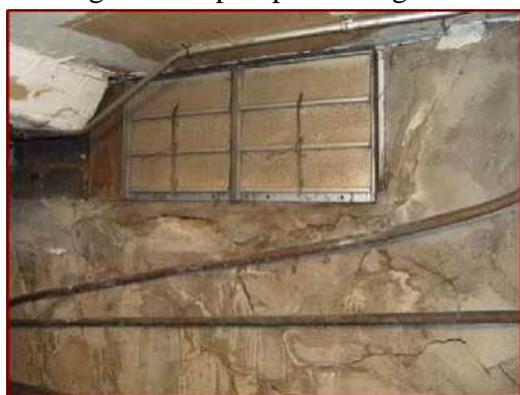


Image 4.10: Uninsulated Copper Piping



Image 4.11: Oil-fired Hydronic Boiler

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 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.

The radiator panel covers on the first floor are intact and have minimal damage. on the second floor in Bedroom 201, 204, and Office 209 there is significant damage to the fins and many of the 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, due to its location, this type of radiator was appropriate.



Image 4.12: Typical Damaged Radiator



Image 4.13: Freestanding Floor Radiator in Kitchen

There are fireplaces located throughout the house which are not in use. The tenants are currently using electric space heaters throughout the first floor to provide heat. The basement has ducts that drop into the crawl space and resurface in the family room closet. During the survey there was no sign of an 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 4.14: Ductwork in Closet112



Image 4.15: Wall Grille

The first-floor bathroom and laundry room have exhaust fans in the ceiling. An outlet for either exhaust fan was not 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

Completed now Natural Gas Remove the underground oil storage tank and oil-fired boiler. A new high-efficient gas-fired boiler with sealed combustion is proposed. The existing hydronic heating water piping and radiators will be reused for heating. The piping and radiators shall be pressure tested, cleaned, and repaired as required.

Completed A hydronic unit heater will be provided to heat the basement. A dehumidifier will be provided in the basement to remove moisture.

A split system air conditioning system is proposed for the first floor. The air handling unit (AHU) will be installed in the first floor under the front stairwell. Supply air will be ducted down to the crawl space. The front part of the building will be served by ductwork in the crawl space and floor registers. The supply air ductwork for the rear of the building will be routed up through the floor inside a chase in the men's room and overhead in a bulkhead at the ceiling. Air will be distributed through sidewall registers. Return air will be through a wall-mounted grille. The air-cooled condensing unit (air conditioner) will be installed outside at grade behind a screened enclosure. Refrigerant piping will connect the indoor and outdoor units.

A split system air conditioning system is proposed for the front part of the second floor. The AHU will be installed horizontally in the attic. Supply air will be ducted above the ceiling in the attic and distributed through ceiling mounted registers. Return air will be through a ceiling mounted grille. The air-cooled condensing unit will be installed outside at grade in the screened enclosure. Refrigerant piping will connect the indoor and outdoor units.

A ductless split air conditioning system is proposed for each of the two second floor offices at the rear of the building. There is no attic above these rooms to allow for a central system and bulkheads are not desired in these areas. A dual zone condensing unit capable of providing cooling for both AHU's will be installed outside at grade in the screened enclosure. Refrigerant piping will connect the indoor and outdoor units.

Exhaust fans will be provided for each toilet room on the first floor. The fans will be ducted to a wall cap in the exterior wall.

An attic fan will be provided on the existing gable louver on the side of the house for attic ventilation. Intake air will be provided through the remaining existing gable louver on the rear of the house and the new gable louver on the front of the house.

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. 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 some of the piping is abandoned in place.



Image 4.16: Sanitary Sewer Piping



Image 4.17: Sanitary Sewer Piping

A 40-gallon electric water heater in the basement with an installation date of 1995 provides domestic hot water to the house and appears to be in fair condition.

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.

The first floor has a kitchen sink with garbage disposer and a dishwasher in the kitchen. The piping



Image 4.18: Sump Pump Within Floor Drain

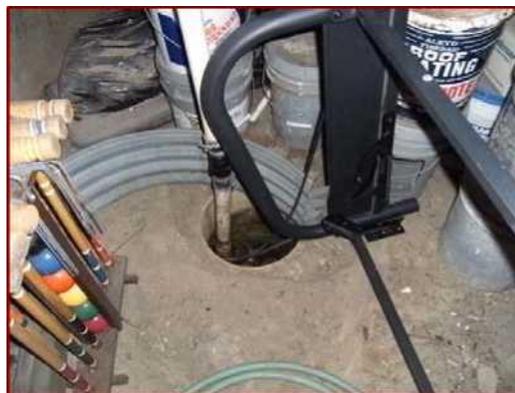


Image 4.19: Sump Pump Within Floor Drain

is copper and is routed from the basement below. The dishwasher is connected to the domestic hot water piping.

The clothes washer and dryer are located in the laundry room. The washer is served by polybutylene domestic water piping. The laundry room also has a mop sink that is being served with copper piping routed from the basement below. The mop 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 plumbing fixtures appear to be in good 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 installed. The drinking fountain has been removed and the sanitary sewer piping has been capped.



Image 4.20: Capped Sanitary Sewer Line Fountain



Image 4.21: Earlier Location of Drinking Fountain

on the exterior of the house there are nine storm sewer (gutter) drains that slope down and exit onto splash blocks, open site drains, or directly on the house. The gutter and drains appear to be cluttered with leaves and debris.

Proposed Plumbing

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 will be removed. It is recommended to test the sump pumps to verify proper operation.

The domestic water, sanitary sewer, and vent piping will be modified as required for the demolition of the existing bathroom and laundry room on the first floor and the new toilet rooms and break room area on the first floor. New plumbing fixtures will be provided.

The second floor toilet room and drinking fountain area fixtures and piping will be removed.

The water heater is approaching the end of its useful life. it is recommended to replace the water heater with a high-efficiency gas-fired direct-vent sealed combustion water heater since gas service was recently brought to the building. The heater can be an instantaneous type, with no storage, for energy savings.

The gutters and downspouts to remain will be cleaned.

ELECTRICAL ASSESSMENT AND TREATMENT PLAN

Electrical and Special Systems Overview

The following description of the facility electrical and special systems is based on field observations performed on March 24, 2010 by SWSG Engineers. All code references are based on 2008 National Electrical Code (NEC).

Electrical Service Entrance

The house is served by a overhead secondary distribution with a secondary voltage of 120/240 volts, single phase, 3-wire from a pole mounted utility transformer at east side of the property ~ 100 feet from the house.

This pole is one of three bringing electrical service from West ox Road to the Visitor's Center located north of the property. in addition to the electric line the pole also supports telephone, cable and fiber lines all of which terminate on the east side of the building. Some of the equipment appears to have been abandon in place.

The power line is run separately from the other conductors approximate 15 feet above the ground. The guy line from the power is supported by an eyelet screwed into the side of the building between the windows, approximately 18" from the closest window which is a violation of the National Electric Code (NEC).

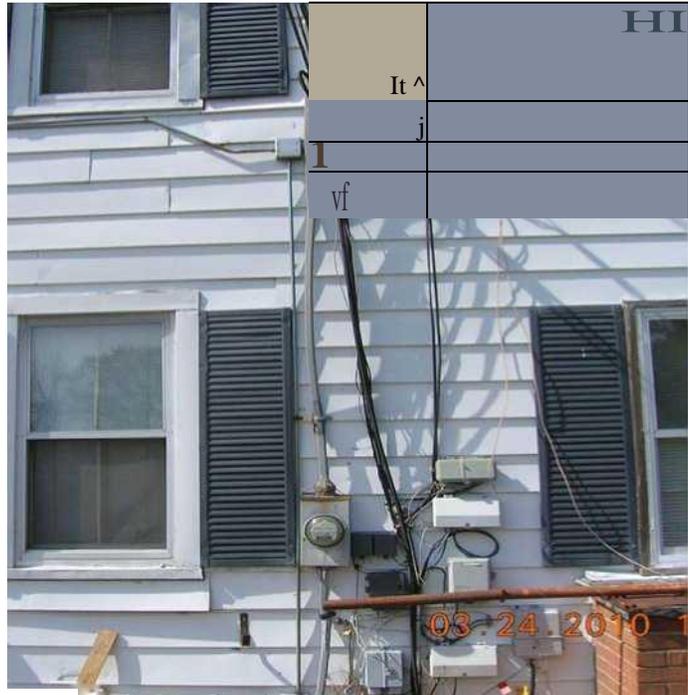


Image 4.22: Exterior Electrical Service Entrance

There is no weather head to protect the service conductors and terminations where the utility conductors are spliced to a USE cable. The USE cable is not in conduit but attached directly to the building which is also a violation of the NEC. The USE cable runs down the side of the building to the electrical meter. This is acceptable for residential use but commercial services should be in conduit.

A ground wire connects several of the communications/fiber cables to the electric meter housing, but no ground wire to a ground rod was found. A ground rod is required by the NEC. A ground wire is connected to the domestic water pipe entrance and the panelboard providing buildings ground. The connection is rusted and should be cleaned and reconnected.



Image 4.23: Ground Connection

The service cable exits the bottom of the meter and penetrates the wall and enters the basement just above grade level. There is no sleeve at the penetration and several of the communications/fiber cable enters the building through the same penetration. Although not a violation this is recommended.

once in the building, the service cable is attached to the bottom of the rafters and runs to the only panelboard in the building. The panelboard is located on a side wall approximately ten feet from the exterior wall.

This location is in violation of the NEC which requires a service disconnecting means within five feet of the service's entrance into the building. The panelboard does contain main circuit breakers which qualify as the service disconnecting means. It also contains a dozen double circuit breakers, is very old and is at the end of its useful life. A waste pipe runs directly underneath the panelboard which is a violation of the NEC. The basement room where the panelboard is located has a very low ceiling and does not meet the requirements of the National Electric code.

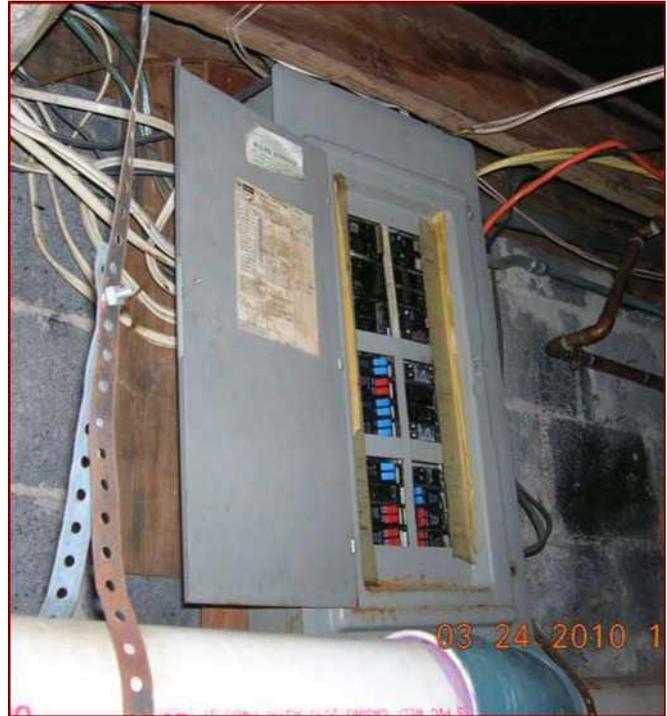


Image 4.24: Basement Panelboard

The existing 200A, 120/240V single phase 3-wire service is adequate for use as office space providing approximately 17 watts per square foot.

Proposed Electrical Service

- **Completed Service now underground** Remove the existing over head service and replace the panelboard.
- **Completed** Install two 4" conduits 24" below grade from the building to the existing utility pole for the electrical service. one for the service wires from the pole mounted transformer to the building and the other as a utility required spare.
- **Completed** Provide additional conduits for telephone, cable and fiber service. Remove abandon equipment at the building exterior.
- **Completed** Turn up the underground electrical service will turn up at the building foundation. convert the conduit to rigid and run through an exterior electric meter to a new 200A, 120/240V single phase 3-wire electrical panelboard located in the first floor laundry room.
- **Completed** Drive a ground rod near the electric meter and extend a grounding electrode conductor to the panelboard. Extend an additional grounding electrode conductor to the domestic water pipe entrance.

Receptacles and Branch Circuiting

All of the observed branch wiring was installed in 'Romex' cable. The cable is inadequately supported in many locations in the basement.

Most of the receptacles observed in the spaces were rated 120 Volt, 20 Amp (NEMA 5-20R). The receptacles on the first and second floor appear to be in good condition and can be reused.

Several receptacles located in the basement area were damaged or without face plates and none of them are GFIC as required by the NEC in an unfinished residential basement. There were also two receptacles mounted on the basement ceiling facing the floor which is an NEC violation.



Image 4.25: Kitchen 'Wiremold';

Receptacles in the laundry and bath rooms were provided with GFIC receptacles

A surface mounted 'Wiremold' strip is mounted underneath the counter in the kitchen and appears supply the only receptacles at the counter. The NEC requires two 20A circuits in residential kitchens and it appears only one is furnished. Two receptacles are not required if the building is changed to commercial use.

in several rooms electric baseboard heaters are installed continuously at exterior walls with receptacles are installed above the baseboard. This is an NEC violation.



Image 4.26: Receptacle above Baseboard

Proposed Receptacles and Branch Circuiting

- Ensure that all devices are grounded and provided with green ground wires in individual branch circuits per NEC Articles 250 and 210-7.
- Verify the existing GFCI receptacles and AFCI circuit breakers are functioning. Provide GFI receptacles in basement and at the exterior adjacent to the proposed mechanical equipment. Provide a GFI receptacle in attic space.

- Replace all existing branch wiring. Remove all exposed wiring and abandon in place all concealed wiring. Install new circuits in EMT, rigid metallic conduit and flexible metallic conduit.
- Install branch circuits for general receptacles at the basement ceiling where possible directly to the device to minimize wall perforations.
- Branch circuits for general lighting shall be running from the basement up to the attic or ceiling space in flexible metallic conduit. provide rigid conduit for lighting circuits in the basement space to protect wire from physical damage. install junction boxes in ceiling space as necessary to facilitate the work.
- Provide supporting electrical service for proposed mechanical equipment.
- Install supporting telephone and fiber service to the space as required to support the proposed conversion to office use.

Lighting

The house contains a mixture of light fixtures. porcelain screw-in fixtures controlled by a lights switch or pull chain were found in the basement. Recessed incandescent lights are in the hallway and stair entrance. A three lamp ceiling mounted fixture is in the front entrance with surface mounted fluorescent fixtures of various styles are found in the some of the rooms and kitchen. Wall mount fixtures are in the bathroom and several of the second floor bedrooms are provided with switched outlets for lighting.

Floods lights are surface mounted at the on the exterior eave of the house with wall mounted entrance fixture by the doors.

The lighting is adequate for residential use.

Recommended Lighting Treatment

- Salvage and reuse existing light fixtures in the basement and where possible throughout the house.
- Replace existing light fixtures in the kitchen.
- Install surface mounted fluorescent fixtures in proposed office space.
- Install compact fluorescent bulbs in closet and basement porcelain screw-in lamp holders.
- Replace exterior flood lights with HID fixtures with photocell and time clock.



Image 427: Surface Mounted Light Fixture

Fire Alarm Systems

There is no central fire alarm system. Battery operated smoke detectors are located at the house.

Recommended Fire Alarm Treatment

- If the second floor is used as office space a fire alarm system will be required.
- 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