Evanston Arts Center

Evanston, Illinois

Harley L. Clarke House and Coach House

KJWW#12.0615.00

October 25, 2012

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Facility Assessment Report
for
Harley L. Clarke House and Coach House
2603 North Sheridan Road

KJWW #12.0615.00
October 25, 2012

A. Introduction

The Harley L. Clarke House and Coach House were constructed in 1927 in Evanston, Illinois. Since 1969, the Evanston Arts Center has occupied the residence, which totals approximately 20,275 square feet in the main residence and 4,383 square feet in the coach house. KJWW Engineering Consultants was contracted to perform a facility infrastructure assessment of the structural, mechanical, electrical, plumbing, fire protection systems and equipment in the facility. The team has reviewed the existing site and structures to provide feedback regarding ownership's goals for the future of the facility to facilitate a proposal for purchase to the City of Evanston. We will review and assess each existing system and provide feedback regarding its condition, useable lifetime and issues that may impede future plans.

B. Objectives

The purpose of this infrastructure assessment is to analyze the existing building infrastructure to determine condition, capacity, age and arrangement as well as to provide feedback regarding re-purposing the building into a hotel facility. Systems analyzed as part of this report will include the following:

1. Structural Systems
2. Heating, Air Conditioning, and Ventilation Systems
3. Exhaust Systems
4. Plumbing Systems
5. Fire Protection System
6. Electrical Systems

C. Harley L. Clarke House

1. Structural

Existing structural drawings were not available for our review. The following observations and comments were determined as a result of our on-site assessment and walk through

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of the facility on October 1 and October 5, 2012. The review of the existing facility was limited to visual observation of the spaces, and some photographic documentation. Most of the spaces are finished, and the structural members are not visible. One exception is the attic space where the spaces are unfinished and the framing systems are partially visible.

The existing building is a three story structure over a partial basement. At the south end of the building, the structure consists of a one story welding studio that was likely an addition to the original building(s). The envelope and façade consist of a non-structural masonry and stone veneer over load bearing wall framing consisting of sawn lumber. The roofs consist of clay tile on top of wood sheathing supported by sawn lumber. The wood roofs appear to be mainly stick built. There are some timber trusses at the 3rd floor above the studio area. In general, no major structural deficiencies were observed, or noticeable. Items noted during our on site assessment are as follows:

a. The basement is in good condition and relatively dry. No signs of significant foundation issues were discovered. The floor slab is in good condition. The perimeter basement walls were dry and very little cracking is present in the cast in place concrete walls. See photos S1 and S2.

b. The 1st, 2nd and 3rd floor framing in general is not visible. At the basement level, at one or two locations there was an abandoned MEP penetration. Through the abandoned opening the framing is visible and consists of wood floor joists. See photo S3.

c. The 1st, 2nd, and 3rd floor areas are covered with finishes. The floors do have some noticeable creep and low points. “Bounce” and floor vibrations were not noticeable. The low points are common for wood floors and not of structural concern. These areas should be reviewed by the contractor when the flooring is replaced and evaluated for rotting or cracking and replaced as necessary.

d. From the 3rd floor, some of the roof framing is visible in the storage room, and from the attic above. At both areas, the roof is framed with sawn lumber. The attic has a partial area where timber trusses are utilized to clear span the studio. See photos S4-S6. No significant structural issues were observed.

e. Because of the size of the building and the distance between opposing outside walls, we are of the opinion that many of the interior walls are load bearing. Because the walls are finished, determining the configuration, location and extent of load bearing walls is not possible at this time.

f. The exterior of the building is in need of general maintenance. Please refer to the architectural comments for additional items related to the building envelope. Items observed to be in a general state of disrepair are:

1) The stone work and veneer are in need of tuck pointing. Due to the amount of ivy and vegetation growing on the façade, the amount of mortar joint deterioration is unknown. See photo S7 and S8.

2) The porch and entry stair at the NW corner of the building have significant issues. It appears the stair has settled. It also appears a repair was performed and a wood stair was constructed as a remedial solution. See photo S9.

3) The windows appear to be original construction. The trim around the windows, and caulk joints appear to be in poor condition. See photo S10.

4) The roof is a clay tile type shingle on top of sloped roofs including gable, hip, and flat roof sections. There are areas where clay tiles are missing. See photo S11.

g. The weld shop (conservatory) is a steel framed structure consisting of custom steel trusses and custom steel columns. There is some masonry infill and glass infill between the steel columns. The structure appears to be in fair condition, but some signs of steel corrosion are visible. The corrosion appears to be cosmetic in nature. The corrosion should, at a minimum, and be cleaned with a wire brush, primed and painted as a part of the renovation. The roof appears to be some type of gypsum/formboard roof deck. See photos S12 through S15.

2. Mechanical

a. Utility Connections

1) Water Service: The existing water service to 2603 North Sheridan Road enters the building at 1-1/2” with a 1” water meter. No site utility plans were available for review to determine the exact source of the water service, although it is reasonable to assume that service is fed from Sheridan Road. The water service enters the basement in the storage area to the south of the Kiln Room.

2) Natural Gas Service: A 3” natural gas service enters the basement storage room adjacent to the Kiln Room and is metered inside the building. The natural gas is distributed from this location to various uses throughout the building.

3) Sanitary Sewer: A 4” sanitary line leaves the house from the storage room to the south of the Kiln Room.

4) Storm: No storm service to the building exists. Storm water is discharged to grade.

3. Heating, Ventilation & Air Conditioning

a. Existing Conditions

1) Heating Systems: A single boiler supplies hot water for heating to the entire building. The boiler was manufactured in 1980 by Hayes Boiler. It has a capacity of 200,800 BTU per hour and is located in the basement boiler room. The boiler feeds hot water to radiation units located around the perimeter of the building. No air handling equipment uses are served from the boiler. The radiation units served by the boiler are steam radiators that are typical of buildings of this vintage. It is likely that a steam boiler once existed in the building and this conversion to hot water happened without converting the radiators. Based on conversations with the building engineer, the boiler system is fully functional and is sufficient to heat the building. However, the 32 year old boiler is approaching its usable lifetime and is not as efficient as modern hot water boilers. See photo M1.

The combustion air for the boiler system is provided by a small louver in the wall of the boiler room. The louver has an automated damper that opens when the boiler is in operation. The size and arrangement of the louver present several issues including the fact that it is smaller than required by code for the proper amount of combustion air and being located in an area well means that it is frequently blocked by leaves and debris. See photo M2.

The boiler flue extends through the boiler room wall and appears to transition vertically into a shaft out of the building.

The boiler system expansion tanks appear to have been replaced in 2000 based on the tank tags. See photo M3.

A unitary boiler controller is located on the wall of the boiler room. The controller provides basic hot water reset and control of firing and the circulation pump. See photo M4.

The conservatory is heated via gas fired radiant heaters that appear to be in average condition.

2) Air Conditioning Systems: No central air conditioning exists with the building. All cooling for the building originates from window air conditioning units distributed throughout the facility that range in capacity between 8,000 and 18,000 BTU per hour. These units do not provide ventilation to the space, functioning as recirculating units only. See photo M5.

3) Ventilation: Because the building has no central air handling systems, the ventilation requirements for the building are intended to be addressed through operable windows. Although this is acceptable by code, it is unlikely that these operable windows would be used during inclement weather for ventilation, and in some cases, the windows are undersized based on the current code requirement. In addition, many operable windows are near sources of exhaust from the building, which presents a separate code issue and further limits the use of these windows to meet the ventilation requirements.

4) Exhaust Systems: Various process and other exhaust systems exist currently in the building. Most of these are related to the current usage of the building and would not be required for the proposed usage.

   a) Toilet Exhaust: Each toilet room is equipped with an individual exhaust fan that exhausts directly outdoors. This arrangement is typical of a residential style system. The exhaust ducts either terminate at the roof level after passing through the attic or through a sidewall vent.

   b) Ceramics Exhaust: The lower level ceramics area has a dedicated exhaust fan with unitary controls. The exhaust fan is in average condition and appears to be working.

   c) Kiln Exhaust: The kiln area has multiple exhaust fans to purge heat directly from the kilns in the space. The ductwork and condition of the fans are poor.

   d) Glaze Room Exhaust: A make-shift paint spray booth has been created in an area well on the eastern side of the building. There are several code issues that are present with this arrangement that include the location of the exhaust discharge with respect to height and proximity to operable windows. See photo M6.

   e) Dark Room Exhaust: The dark room process exhaust system is routed from the lower level to an exhaust fan on grade at the north side of the building. See photo M7.

   f) Conservatory Exhaust: Various general and point source exhaust exists in the conservatory based on its current use as a

welding instructional facility. These systems are old and appear to have reached their useful lifetime.

g) Make-up Air: No make-up air systems exist in the current facility to address pressurization issues created by the multiple exhaust sources described above. This deficiency causes infiltration throughout the year that could contribute to temperature, humidity control and indoor air quality issues.

b. Conclusions & Recommendations

1) The existing HVAC systems are in poor condition and we recommend replacement regardless of the future program for the space. If a hotel occupancy is pursued, a number of primary HVAC systems could be selected based on space requirements, ability to incorporate the systems into the historic residence, cost and efficiency. At a minimum, the following requirements should be included:

a) New hot water, condensing style boiler with distribution piping, pumps, controls and piping ancillaries. The boiler would address heating needs at the perimeter and be incorporated into the primary air side HVAC system.

b) Primary air side HVAC for the hotel rooms. Depending on budget, the primary HVAC system could consist of 4 pipe fan coil units, variable refrigerant volume terminal units or heat pumps. Each of these systems would require different central plant components that would need to be evaluated during design. Given the amount of land included with the building, the potential to incorporate a geothermal heat sink in the project is a possibility that would increase efficiency and eliminate the need for equipment at grade or in the building for heat rejection.

c) Make-up air system to address building pressurization and ventilation requirements for the building.

d) Toilet exhaust systems for the guest rooms.

2) The process exhaust systems that currently reside in the building are unlikely to be required moving forward. All systems should be removed.

4. Plumbing

a. Existing Conditions

1) Cold Water: Domestic cold water is distributed throughout the facility from the service entrance. The building is not equipped with a domestic booster pump for the water service. No pressure gauges were located at

the service entrance to determine the pressure being supplied by the municipal system.

Piping for the water system is a mixture of galvanized and copper and appears to be in average condition. We recommend replacement of the galvanized piping regardless of future building usage.

2) Hot Water: Domestic hot water for the building is produced by one storage type water heater located in the basement boiler room. Although no documentation for the water heater was located, we believe that the heater is newly installed. The code report authored by WMA Consulting Engineers, dated July 25, 2012 indicates the presence of a 20 year old water heater. The existing water heater is a 50 gallon tank type heater (A.O. Smith Model GCVX) with 65,000 BTU/hr (Input) and is in excellent condition. See photo M3

3) Sanitary and Vent Systems: Sanitary and vent piping appeared to be in average to poor condition throughout the building. It is clear that the usage as an art center over the past 40+ years has introduced many items to the drainage system that are not typically found in most buildings. In some cases, the original cast iron piping has been replaced with sections of PVC piping. Although plaster traps and other protective devices have been placed on some fixtures, we do not believe these have been effectively maintained and installed on all fixtures throughout the Evanston Arts Center's occupancy in the building.

4) Fixtures: The majority of the existing plumbing fixtures are in poor condition. Many of the fixtures (such as bath tubs) have been converted into basins for art uses. It was unclear from visual inspection, but appears that piping to these items has been capped. Other original fixtures have been removed over time.

b. Conclusions & Recommendations

1) Based on the future use as hotel occupancy, it is clear that nearly all existing plumbing piping and fixtures would need to be removed and replaced. This would be required based both on location and count, as well as the general condition of the current systems.

2) Although the hot water heater is new, it would not be the appropriate size to serve a new hotel occupancy as the demand of the new system would be much greater than what the heater could support. A hot water recirculation system should be included in the new domestic hot water plant to ensure timely delivery of hot water to guest rooms.

5. Fire Sprinklers

a. Existing Conditions: The building is presently not sprinkled.

b. Proposed Building Usage: If the building is converted to a hotel or other commercial occupancy, it would be required to be fully sprinkled. In order to sprinkle the building, the water service would need to be upgraded to a larger size and the pressure delivered from the municipal system would need to be evaluated to determine whether a fire pump would be required. Density of coverage would be based on NFPA requirements.

6. Electrical Power

a. Existing Conditions: The existing electrical service is provided by an underground utility feed which enters the building in the basement on the west side into the mechanical room. The service meter and main distribution panel (MDP) are located in the mechanical room. See photos E1 and E2.

The electrical service and MDP are rated for 240/120 volts, 1 phase, 3 wire, 600 amps. The MDP has 4 circuit breakers which serve the following panels:

- Left panel in boiler room
- Sculpture department panel
- Right panel in boiler room
- 1st floor panel

The MDP appears to have been replaced in the 1980's and is in good condition; however, all other branch panels appear to be dated and are in fair to poor condition. Several panels are load centers which are not typically used in commercial applications. One load center on the 3rd floor was observed to have "mini" circuit breakers, which is not code compliant. See photos E3 and E4.

Several open junction boxes with exposed wiring were observed throughout the building. Having open junction boxes is a code violation and presents possible electrical hazard conditions. Cloth insulated wiring was also observed in several locations which indicates that some wiring is original to the building. See photos E5 and E6.

A significant number of outlets and wiring have been added in the building which is evidenced by the amount of surface mounted raceway and surface conduits throughout the building, particularly in the art studios.

b. The existing electrical service would be adequate if the building continues to be utilized as currently occupied and additional loads, such as air conditioning, are not added. However, if the building undergoes a major renovation or conversion

to a hotel, the existing electrical service would not be adequate to support the new building loads. The existing service voltage of 240/120 volts, 1 phase is generally used in residential applications and older buildings. Large buildings typically have 480/277 volts, 3 phase service and smaller buildings typically have 208/120 volts, 3 phase services to support the building loads.

c. The existing distribution system is dated and in poor condition. The majority of the panels are old with limited space to add circuit breakers for additional circuits. Also, the wiring is dated and in some cases cloth insulated which is no longer code compliant.

d. For a major renovation or conversion, a new electrical service and distribution system including panelboards and feeders would be recommended. For conversion to a hotel, a new 208/120 volt, 3 phase service would be recommended. The estimated size for the new service is 800 amps - 1,000 amps to be confirmed by the engineer of record during the design phase.

7. Electrical Lighting

a. Existing Conditions: General interior lighting within the building is a combination of incandescent and fluorescent fixtures. Many of the incandescent lamps have been retrofitted with compact fluorescent lamps. The majority of the incandescent light fixtures are socket type fixtures or track lighting. The majority of the fluorescent fixtures are industrial strip type.

Lighting controls consist of local switching in each area.

The existing emergency lights are battery type. The emergency lighting illumination could not be verified at the time of the survey. However, based on the current locations, it appears that all the paths of egress would not be adequately illuminated. Exit lights are located throughout the building. However, based on the current locations, it appears that all the paths of egress would not be adequately illuminated. See photos E7 and E8.

Exterior lighting consists of building mounted flood lights and lighting bollards. All exterior lights are HID type. The lighting controls could not be determined. Exterior lighting illumination could not be confirmed due to daylight at the time of the survey.

The fluorescent industrial strip and track lighting appears to be in good condition and provides adequate illumination in most areas. The incandescent lighting is

mostly old and in poor condition. The existing lighting is not energy efficient and most likely does not meet the latest energy codes.

The lighting controls consist of manual switching which does not comply with the latest energy codes to automatically shut-off during non-occupied areas.

The emergency lighting is in fair condition, however, adequate illumination is not being provided. The exit light fixtures are old, in poor condition and not energy efficient.

The exterior lighting appears to be in fair condition at best, however, it is not energy efficient and may not be providing the proper illumination required.

For a major renovation or conversion, we recommend replacement of all lighting and associated controls to comply with the latest energy codes and provide more uniform illumination.

8. Fire Alarm

a. Existing Conditions: The fire alarm system is a conventional hardwired Fire-Lite MS-2410B system. Pull stations at the exits, smoke detectors, horns and strobes are located throughout the building. The building is not sprinkled and therefore has smoke detectors in most spaces. See photo E9.

b. The fire alarm system is in good condition; however, if the building will undergo a major renovation, a new addressable fire alarm system would be recommended.

D. Coach House

1. Structural

The existing building is a two story building over a partial basement. The northwest portion is over a crawl space. At the west end of the building, there is a one story green house building. At the east end, a one story garage, with attic space above. Similar to the main house, the envelope and façade consist of a non-structural masonry and stone veneer over load bearing wall framing consisting of sawn lumber. The roofs are clay tile over wood sheathing supported by sawn lumber. The wood roofs appear to be mainly stick built. In general, no major structural deficiencies were observed, or noticeable. Items noted during our on site assessment are as follows:

a. In general, the maintenance on the exterior of the coach house appears to be in better shape than the main house. The exterior stone work and masonry joints

are in much better condition. See photos SC1. Some exterior slabs at the driveway have settled and are need of maintenance. See photos SC 2.

b. The basement is dry and no signs of excessive foundation settlement exist. There is an interior bearing wall in the space and consists of 2 wythe brick. See photos SC3. The exterior basement walls are mostly cast in place concrete and the floor is a cast in place concrete slab.

c. The 1st floor framing is visible within the crawl space. The floor framing is 2x wood joists and wood decking. It appears humidity has been a major issue in this house. The framing does appear to have some deterioration and some of floor joists have water/moisture damage. See photos SC4.

d. The 1st floor framing has excessive vertical deflection, and is very noticeable. See photos SC5. Depending on the cause of the "sag", this area may require replacement. If replacement is not required, the floor will likely need to be shimmed to provide a more level elevation.

e. The partial height masonry stone wall around the green house is in very poor condition. See photos SC6.

f. The attic floor space above the garage is cast in place concrete and has some signs of distress including efflorescence and spalling. See photo SC7.

g. The space within the attic (floor space above the garage) is accessible. The "walls" are framed with 2x lumber and serve as the east most hipped roof. See photo SC8. As discussed in item 6, the floor should be evaluated for integrity.

h. The 2nd floor framing was more level than the 1st floor framing (see item 4 above).

The structural review comments relating to the roofing, building envelope and other items that would typically be covered in the architectural review are not intended replace a building envelope study. In some of the items mentioned above, it is evident that many of the coping, flashing, and caulking systems have failed and are in need of general maintenance, repair, or replacement.

2. Utility Connections

a. Water Service: The existing water service to the coach enters the building at 2" with a 1" water meter. No site utility plans were available for review to determine the exact source of the water service, although it is reasonable to assume that service is fed from Sheridan Road. The water service enters the basement at the northern wall. See photo MC1

b. Natural Gas Service: A 2" natural gas service from the utility is regulated at the northern exterior of the coach house and enters the basement. The natural gas is

distributed from this located to various uses throughout the building. See photo MC2

c. Sanitary Sewer: A 4” sanitary line leaves the lower level of the coach house to the west.

d. Storm: No storm service to the building exists. Storm water is discharged to grade.

3. Heating, Ventilation & Air Conditioning

a. Existing Conditions

1) Heating Systems: One small boiler supplies hot water for heating to the entire building. The boiler feeds hot water to radiation units located around the perimeter of the building and separate zone pumps exist based on floor. No air handling equipment uses are served from the boiler. The radiation units served by the boiler are steam radiators that are typical of buildings of this vintage. It is likely that a steam boiler once existed in the building and this conversion to hot water happened without converting the radiators. The boiler is in average to poor condition and is not as efficient as modern hot water boilers. See photo MC3.

The greenhouse area of the coach house is equipped with a separate small boiler that feeds unit heaters and other terminal heating equipment. These systems are in poor condition and in need of replacement. See photo MC4.

2) Air Conditioning Systems: No air conditioning exists with the coach house.

3) Ventilation: Because the building has no central air handling systems, the ventilation requirements for the building are intended to be addressed through operable windows. Although this is acceptable by code, it is unlikely that these operable windows would be used during inclement weather for ventilation, and in some cases, are undersized based on the code requirement.

Proper boiler room ventilation was not present in the basement mechanical space.

4) Exhaust Systems

a) Toilet Exhaust: No toilet exhaust was observed in the coach house toilet rooms.

b. Conclusions & Recommendations

1) The existing HVAC systems are in poor condition and we recommend replacement regardless of the future program for the space. If a hotel occupancy is pursued, a number of primary HVAC systems could be selected based on space requirements, ability to incorporate the systems into the historic residence, cost and efficiency. At a minimum, the following requirements should be included:
   a) New hot water, condensing style boiler with distribution piping, pumps, controls and piping ancillaries. The boiler would address heating needs at the perimeter and be incorporated into the primary air side HVAC system. It could be possible to feed the coach house underground from a central boiler system in the main residence.
   b) Primary air side HVAC for the hotel rooms. Depending on budget, the primary HVAC system could consist of 4 pipe fan coil units, variable refrigerant volume terminal units or heat pumps. Each of these systems would require different central plant components that would need to be evaluated during design. Given the amount of land included with the building, the potential to incorporate a geothermal heat sink in the project is a possibility that would increase efficiency and eliminate the need for equipment at grade or in the building.
   c) Make-up air system to address building pressurization and ventilation requirements for the building.
   d) Toilet exhaust systems for the guest rooms.

4. Plumbing

   a. Existing Conditions
      1) Cold Water: Domestic cold water is distributed throughout the facility from the service entrance. The building is not equipped with a domestic booster pump for the water service. No pressure gauges were located at the service entrance to determine the pressure being supplied by the municipal system. Much of the cold water piping was galvanized, which should be replaced regardless of future program.
      2) Sanitary and Vent Systems: Sanitary and vent piping appeared to be in average to poor condition throughout the building.
      3) Fixtures: The majority of the existing plumbing fixtures are in poor condition. Many of the fixtures have been removed or are in various states of disrepair.

   b. Conclusions & Recommendations

1) Based on the future use as hotel occupancy, it is clear that nearly all existing plumbing piping and fixtures would need to be removed and replaced. This would be required both based on location and count, as well as the general condition of the current systems.
2) A new, domestic hot water heating plant is required for the proposed use of the building. A hot water recirculation system should be included in the new domestic hot water plant to ensure timely delivery of hot water to guest rooms.

5. Fire Sprinklers

a. Existing Conditions: The building is presently not sprinkled.

b. Proposed Building Usage: If the building is converted to a hotel or other commercial occupancy, it would be required to be fully sprinkled. In order to sprinkle the building, the water service would need to be upgraded to a larger size and the pressure delivered from the municipal system would need to be evaluated to determine whether a fire pump would be required. Density of coverage would be based on NFPA requirements.

6. Electrical Power

a. Existing Conditions: The existing electrical service is provided by an aerial drop from a utility pole located on Sheridan Road. The service is rated for 240/120 volts, 1 phase, 200 amps. The aerial feed enters the building on the north side of the building and drops to a main distribution panel in the basement. The MDP feeds all the circuits in the coach house. See photos EC1 and EC2.

Several open junction boxes with exposed wiring were observed throughout the building. Having open junction boxes is a code violation and presents possible electrical hazard conditions. See photo EC3.

b. Conclusion & Recommendations

The existing MDP is starting show signs of rust and is in poor condition. For a major renovation or conversion, a new electrical service and distribution system including panel boards and feeders would be recommended. For conversion to a restaurant, a new 208/120 volt, 3 phase service would be recommended. The estimated size for the new service is 400 amps - 600 amps to be confirmed by the engineer of record during the design phase.

7. Lighting

a. Existing Conditions: General interior lighting within the building is incandescent. Lighting controls consist of local switching in each area. Since the occupancy is residential, there are light switch controlled receptacles in the bedroom.

Exterior lighting consists of building mounted decorative type lights. All exterior lights are incandescent. The lighting controls could not be determined. Exterior lighting illumination could not be confirmed due to daylight at the time of the survey.

b. Conclusion & Recommendations

The existing lighting is in poor condition and should be replaced. For a major renovation or conversion, we recommend replacement of all lighting and associated controls to comply with the latest energy codes and provide more uniform illumination in accordance with the new occupancy type.

8. Fire Alarm

The existing building does not have a fire alarm system. If the occupancy is changed to a hotel or restaurant, a new addressable fire alarm system will be required.

Prepared by: Scott A. Wiercinski, SE, PE, John R. Panek, PE, FPE, LEED AP and Arun K. Garg, PE

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Photo E1

Photo E2

Photo E3

Photo E4

Photo E5

Photo E6

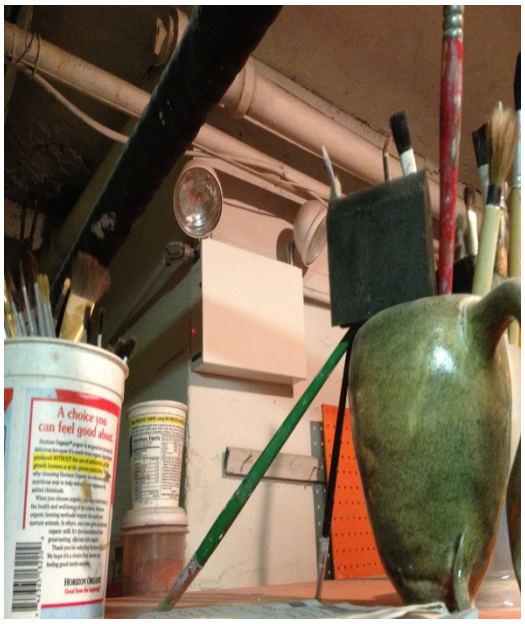

Photo E7

Photo E8

Photo E9

Photo EC1

Photo EC2

Photo EC3

Photo M1

Photo M2

Photo M3

Photo M4

Photo M5

Photo M6

Photo M7

Photo MC1

Photo MC2

Photo MC3

Photo MC4

Photo S1

Photo S2

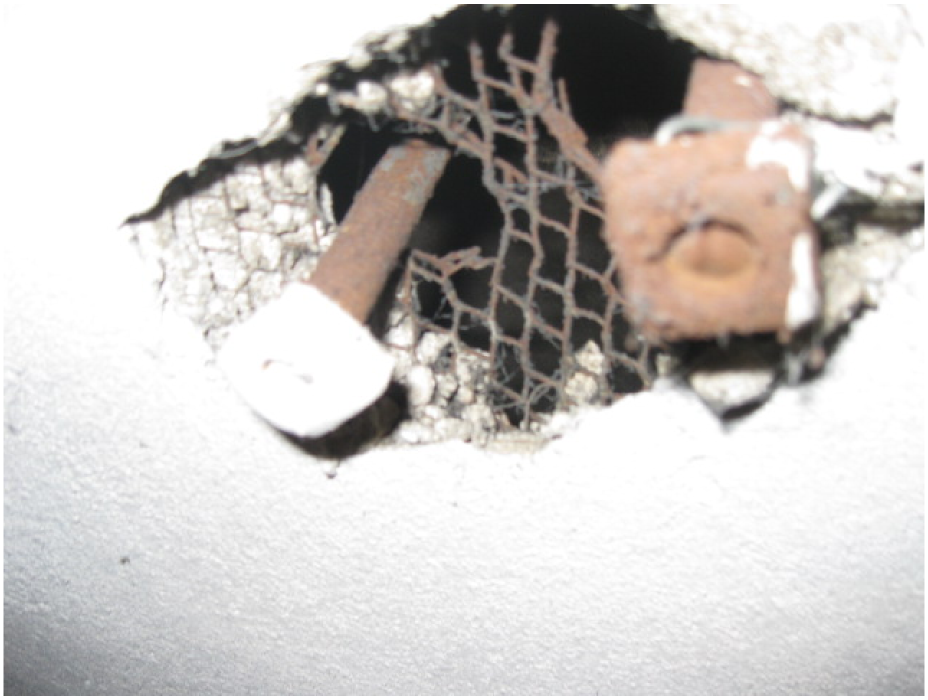

Photo S3

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