Warren County Historical Society
Electrical Evaluation
210 Fourth Avenue
Warren, Pennsylvania 16365

Prepared By

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Struthers-Wetmore-Schimmelfeng House

Overview
The purpose of this study was to review the installed electrical, fire/security alarm, and communication systems within the building to determine if the systems are operating correctly and whether improvements should be made.

The Building is used by Historical Society as an exhibit space and working offices for collection of the County's artifacts. The building is listed in the National Register of Historical Places. The structure is a three-story single family dwelling unit with a full basement.

Kelley Moran from Tec completed a site visit on May 3, 2012. The purpose was to determine the condition of the existing systems and document the capabilities and capacities of these systems. The findings of this survey along with photographs of the systems with issues are recorded elsewhere in this report.

This report will also provide insight into the operation of the Electrical systems in order to offer a recommendation as to what if any changes should be instituted.

1. System Overview

Site Lighting
The parking lot is shared with the Warren County Courthouse. The lot on the North side is lit by one wall mounted area light. The appearance of the light and the mounting is more of a utility light and does not match the period. The area light appears to be in fair condition but could not determine if these are Mercury (blue-green) or Metal Halide (white light). The only other site lighting on the property was the lights on the porches that illuminate the front and side entry.

Electrical
The electric service to the building appeared to be 100 Amp service at 240/120 Volt, 1 Phase, 3 Wire. The electrical demand on the meter from the local electric utility shows a maximum demand of 5.1KW or about 21 Amps. This is extremely low and indicates very good manual control to limit wasted electricity. *Is there a documented plan to add air conditioning or special event power?*

Fire Alarm and Special Systems
One supplier has supplied the fire alarm, security, intercom and camera systems for the past several years. Allied Alarm Company services these systems – contact name is Mr. Michael Roberts, (716) 665-6700. The fire alarm system is combined with the security into one panel that is monitored. The system is working but is no longer supported. The future maintenance is very much in question. There was no local annunciation of an alarm other than at the panel. Audio-visual signals were not observed.

The security has the door contact, interior motion detectors and break glass detectors.
The keypad at the interior of the Staff toilets initiates the system.
The phone system is working and uses the dial-up service for data.

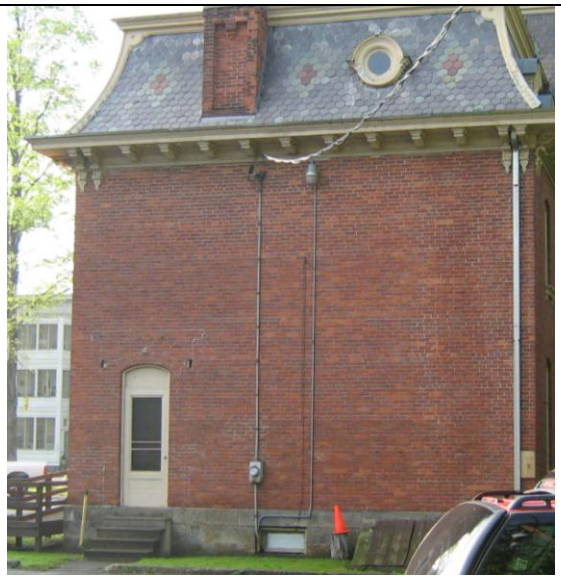
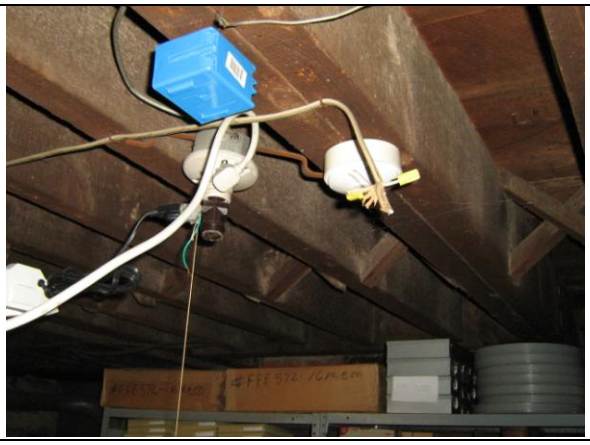
Findings

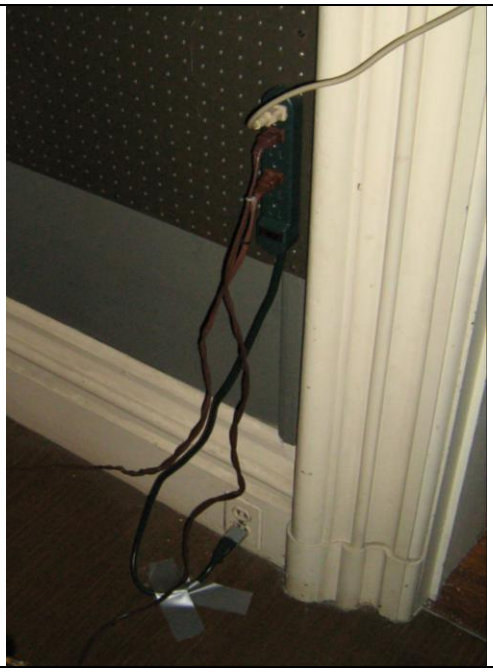
1. The existing electrical service is overhead from a pole at the property line to the meter on the building. The surface mounted mast, meter and cable extend down into basement through a window opening. The cable appears to be USD or some outdoor service entrance rated cable. There is no physical protection from damage.
2. The main electrical panel is the only panel in the building and is old. The "pushmatic" type breakers are beyond useful life and parts are no longer supported.
3. The combined fire and security system is in good operating condition. The system uses wireless device with integral battery power. System supplier is Allied who provided the system and is supporting with ongoing maintenance. The batteries do require replacing periodically but the trouble alarm that is generated is sufficient for proper notice and replacement.
4. The history of the building indicates the age of the systems. Constructed in 1870's, the servant's quarters on the third floor have no electricity, no lights or receptacles. Some of the current wall mounted lights appeared to be where gas supplied lights would have been. In the 1950's the government used the building for offices. The panel in the basement and the wiring in the walls were most likely installed at that time. The wiring was done with some "black pipe" but most was done in a cloth covered "romex". There are lights, switches and receptacles from the 1950's that are still used today. The current statuses of the renovations have been limited by lack of funding. The necessary repairs were completed by the in-house maintenance staff with little work done by professional contractors.
5. Due to the residential construction, the wiring is romex without a ground. The use of Romex in a commercial building is not permitted and further Code review should confirm the Use Group.
6. The amount of open junction boxes and splices in open air are numerous. The exposure to arcing faults and shock hazard for personnel is great
7. The existing wiring that is in the light fixtures is old and questionable for insulating value. The cloth covered single conductors have deteriorated throughout the years and are potentially hazardous. Cleaning or replacing lamps could compromise the insulation.
8. There is a lack of receptacle and circuiting.
9. Egress lighting that would consist of exit sign and battery packs were not observed. The exterior doors should have remote heads to light the discharge path from the building.

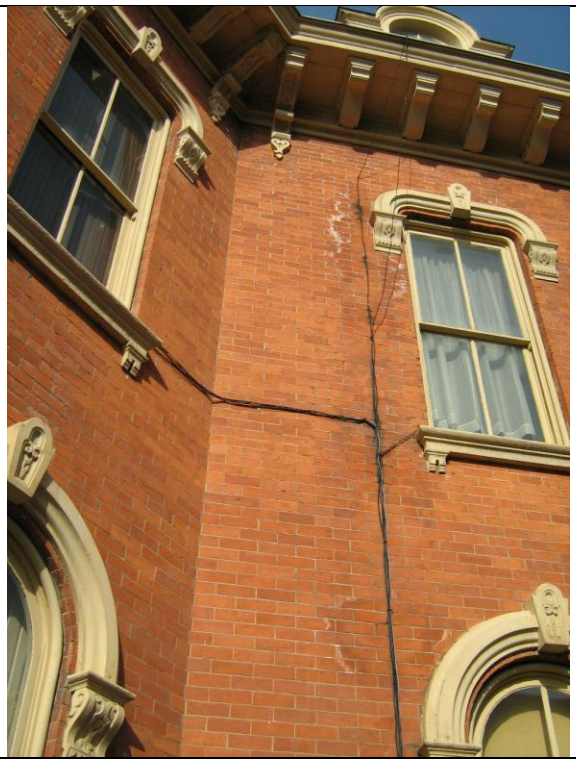
2. Observed Conditions

Electrical

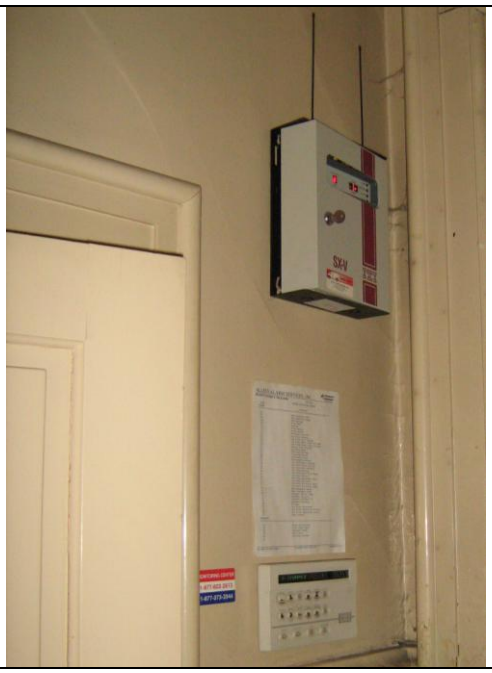
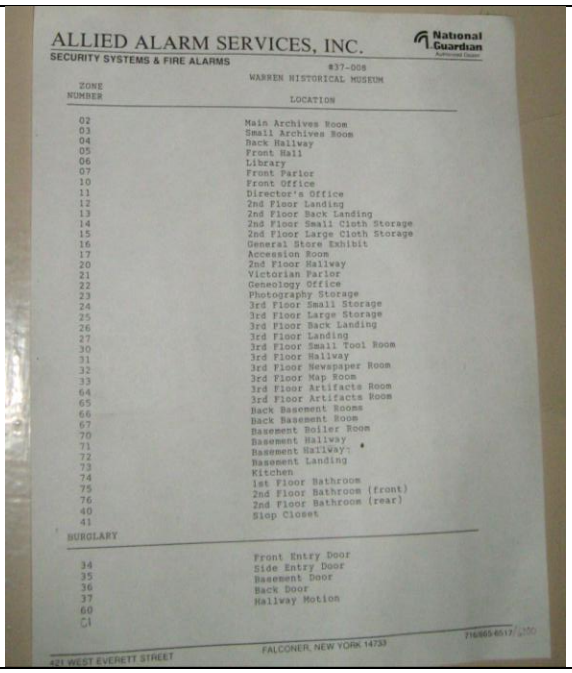
The following is the condition of various pieces of the electrical systems along with photographs. The condition of these items in some cases will need immediate attention; others can be corrected as projects are undertaken in the associated areas.

		
The overhead service and area light are exposed and directly seen from parking.		This panel is located in the Basement and is obsolete.
		
Branch circuiting is in Romex and other non-code compliant wiring methods		Open wiring and no fixture or box for splices.
		
Open junction boxes and exposed wiring splices		Energized cables not terminated properly and misuse of extension cords

		
Extension cords are plugged end to end and using the lighting circuit for power		Socket extender and plug powers extension cords for portable appliances
		
Cord penetrates from the basement to power the conference room table.		Cords and plugstrips are used to power lights in the hallway and for displays

		
The exposed wiring on much of the building is abandoned. Wireless technology would help in allowing this to be removed.		Kitchen outlet and multi-strip for counter appliances
		
Snow Melt power cable penetrates the wall and enters the attic.		Socket extenders are labeled to prevent powering the snow melt cables.

		
There are better fixtures for storage areas.		Fixture's appearance and performance are not consistent with the space. Mounting is not per Code.
		
Fixture is very old and does not light all the time		Light in the basement is not safe.

		
Fire alarm panel and security keypad are located in the staff toilet.		Allied Alarm has been servicing the system and is prepared to replace it with a new Solid State system.

3. Summary of our findings

List for Owner review

The following list represents our findings in order of recommended improvement. There are many factors that could change the order. A roof replacement project may move the snow melt recommendation to the top

- Replace the panel
  - Add capacity for cooling
  - Consider adding capacity for special events
  - Replace the overhead utility cable for phone and power. The new duct bank would require trenching and backfill. The grassy area along the West property line could be used for this purpose.
  - Remove the meter from the north side of the building and move to the west lawn area away from the structure.
- Replace all wiring. Add outdoor.receptacles. Add receptacles to all the various rooms to reduce the use of extension cord.
- Replace the complete fire alarm system. This includes new ADA signals, manual pullstations and automatic detection.
- Update lighting and renovate lights that are selected by the owner. It is important to keep the appearance with the other finishes in the space. There are specialty companies that produce historically accurate fixtures. Rejuvenation is America's largest manufacturer and leading direct marketer of authentic reproduction

lighting and house parts. These fixtures are expensive. The Owner may select substitute fixtures that are new and UL listed

- Remove all the tele/data cables that are abandoned on the outside
- Replace the building mounted area light. Exterior and accent lighting is needed
- Add dedicated snow melt cables for the roof and gutters

4. Recommendations and Conclusions

Lighting
The linear fluorescent luminaires are utilizing T12 lamp technology. It is our recommendation that the lamps and ballasts be replaced (or the entire luminaire) as T12's will no longer be commercially available due to Department of Energy lamp legislation passed in 2007. Additionally, the change from T12 to T8 (or T5) technology will offer better color quality as well as energy savings.

The incandescent lamps in the space have a lamp life of only 800 to 2000 rated hours. It is our recommendation to consider replacing the incandescent with new LED lamps. Replacing the entire fixture would be the most efficient option that will provide significantly higher lamp life and less energy costs.

In general, the lighting is at the end of life and the energy saving would justify the replacement. As an example, the storage areas could be retrofitted with cost-effective strip fixtures. The new lights would be instant on, would require less maintenance and would use less energy. This better performance will result in a 2 to 3 year payback. It would be quicker but the limited use of these areas is factored into this estimate.
Add occupancy controls in the stairways that maintain minimum safety standards but automatically switches most of the lights off.

Electrical
The electrical distribution should replace the Pushmatic panel. An additional panel on the third floor may help with snow melting and adding circuits to the second and third floors.

Fire Alarm
The system should be fully tested and documented. A new dedicated fire alarm system should be budgeted to provide only the Life Safety function that saves lives. The new fire alarm systems provide improved detection and reporting while reducing false alarms. Proper locations and coverage should alert all occupant of a fire.