EXISTING BUILDING REVIEW

125 State Street

Name: Madison Fire Engine House No. 2/ Castle & Doyle Building
Built/alterations: 1856/1921-22
Designated City landmark

Overview:
Reviews of this building were performed by the following companies:

Building Interior and Exterior	Wiss, Janney, Elstner Associates, Inc
Structural	Pierce Engineers, Inc.
Mechanical, Plumbing, Fire Protection	Henneman Engineering, Inc.
Electrical	Potter Lawson
Asbestos Inspection	Advanced Health & Safety LLC

History:
The Castle & Doyle building has a retail store at grade and most recently an apartment on the second floor. The second floor is vacant.

View of Front Facade


Exterior: View of side wall (party wall) between 125 state street and 121-123 State Street


Exterior: View of roof


Exterior: View of entry stoop to first floor retail


Exterior: View of existing stoop to second floor access


Basement


Basement Access Stair

First Floor Retai: View from entry door on State Street

First Floor: View from within the store toward state street entrance

First Floor: View of vault door

First Floor: Celling cornice

View of tile entry stoop from stairway to second floor

View of stairs to second floor

Second Floor: View of kitchen and hallway to bedrooms

Second Floor: View toward State Street windows

Second Floor Apartment

WJE ENGINEERS ARCHITECTS MATERIALS SCIENTISTS

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125 State Street – Architectural Review

Walk-Through Observations: December 16, 2011
Reported by: Kenneth M. Itle
WJE No. 2011.5656

This letter summarizes the WJE observations of architectural interior and exterior features of 125 State Street, Madison, Wisconsin. The exterior survey was performed from grade and from accessible flat roof areas. The interior survey was conducted in accessible spaces. Additional investigation would be required to develop appropriate repair recommendations.

The building at 125 State Street is a two-story masonry structure that is designated a landmark by the City of Madison. The building has a north facade facing State Street, an angled southwest-facing facade along North Fairchild Street, and east and west party walls connected to adjacent buildings. According to the landmark nomination, the building was initially constructed in 1856 as Madison Fire Engine House No. 2. In 1921, the building was substantially renovated for the Castle & Doyle Coal Company. According to the landmark nomination, the State Street facade and all historic interior finishes date to the 1921 renovation, while the Fairchild Street facade dates to original construction in the nineteenth century.

Exterior

State Street Facade

The State Street facade is clad with white and green glazed terra cotta masonry (Figure 1). At the base of the facade, the masonry veneer appears to have been altered after 1921; this area includes marbleized cast stone panels as well as exposed common brick masonry (Figure 2). The terra cotta masonry is generally in very good condition, with a few individual damaged units, including one cracked window sill, one unit with a hole, one spalled unit, and one displaced unit above the first floor storefront (Figure 3 through Figure 5). At two locations, terra cotta coping units have been removed and set on the roof surface. Mortar joints in the terra cotta masonry are generally eroded. One inspection opening through the interior finishes at the second floor had been created by others prior to the site visit. At this opening, the back side of two terra cotta units are visible, as well as two wythes of brick backup masonry. One steel tie wire connecting the terra cotta to the brick backup was observed at this opening.

The central storefront at the first floor is a bronze-framed window. Previously, the storefront appears to have been a single large glass unit; an aluminum mullion has been added at the center of the opening, dividing it into two panes (Figure 6). Above the storefront and entrance doors are prism glass transoms incorporating operable sash. The first floor exterior entrance doors are stained and varnished wood stile-and-rail doors with brass hardware and ceramic tile thresholds. The doors are intact, although the finish is worn.

The central second floor window is a non-original assembly consisting of painted 2x wood framing supporting four panes of glass and a separate, similarly divided storm window (Figure 7). The smaller windows at either side are one-over-one wood double hung windows dating to the 1921 renovation. These windows are covered by exterior aluminum triple track storm windows, although some of the storm

window sash have been removed. The wood windows are in fair condition, with missing components such as the parting stop, loss of paint and glazing putty, and some wood decay and displacement of window sash joinery (Figure 8).

Fairchild Street Facade

The Fairchild Street facade, which apparently dates to the original construction of the building circa 1856, has a stone foundation at grade (Figure 9). Above the foundation, the walls are load-bearing red brick masonry in a common bond with headers every seventh course. Limestone is used for window sills. Window openings are formed with two-course rowlock brick arches.

Throughout this facade, individual brick units were observed to have erosion or spalling of the face of the brick (Figure 10). Cracks and spalls that have been previously filled with mortar were observed (Figure 11). Also, localized areas of brick masonry appear to have been rebuilt previously (Figure 12). These rebuilt areas were sounded with a hammer and seemed hollow, indicating that the newer outer wythe of masonry may not be well integrated with the original backup masonry.

Remnants of a previous coating on the masonry were observed at more sheltered areas near the top of the facade (Figure 13). Depending upon its vapor permeability, the previous presence of this coating may have exacerbated the spalling and deterioration of the brick units observed throughout this facade.

The Fairchild Street facade has wood one-over-one double hung windows that likely date to the 1921 renovation of the building. There is also one emergency exit door and one inward-swing casement window of similar age. The windows are covered by exterior aluminum storm windows. Where observed, the windows on this facade were in good to fair condition, with loss of paint and glazing putty and localized areas of wood deterioration, particularly at sills and the bottom rails of sashes. The windows have been routed to receive galvanized metal weatherstripping.

The second floor emergency exit door leads to a small steel-framed platform anchored to the facade. The anchorages for this platform have partially pulled out from the masonry, and the steel has widespread corrosion.

Roof and Party Walls

The east and west walls of the building are common brick party walls. A small portion of the party wall is exposed at the light well of the adjacent building at 121–123 State Street. Where observed, the masonry appeared to be in fair condition, with some erosion of brick units and extensive mortar parging on the surface (Figure 14).

The building roof was not accessible but was viewed from the adjacent three-story building. The roof is covered with an EPDM rubber membrane that continues approximately 18 inches up the reverse face of the front facade parapet wall. At the parapet and adjacent party walls, the roof membrane is terminated by a termination bar but there is no counterflashing. The roof slopes from north to south and drains to a continuous hanging gutter along the Fairchild Street facade. The gutter is drained by one downspout at the southeast corner of the building.

Potential Exterior Repairs

Appropriate repairs to the terra cotta State Street facade may include repair of individual damaged units; re-setting of coping units, perhaps to include a through-wall flashing integrated with the roof membrane and counterflashing; and repointing of mortar joints. At grade, a new masonry veneer may be desirable to

replace the existing mixture of common brick and faux marble cladding with a material more compatible with the historic 1921 design of the facade.

The brick masonry on the Fairchild Street facade requires more extensive repairs, likely including replacement of individual spalled brick units, repointing, removal of remnant coatings, and pinning of previously rebuilt areas to connect the face wythe to the backup masonry. Further investigation is needed to quantify the extent of these repairs. The fire escape platform should be removed and repaired or replaced as necessary.

At the first floor storefront on State Street, consideration could be given to removing the added center mullion and installing a single pane of glass to match the 1921 design. The exterior entrance doors should be refinished to match the historic appearance. At the second floor, the center window on the State Street facade should be replaced with a new window system matching the 1921 design.

The double hung wood windows throughout the building should be restored, including stripping and repainting, repairing the wood frame and sash as needed, reglazing, and repairing the pulley and counterweight balance system. If desired, new interior or exterior storm windows can be provided to improve the thermal efficiency of the windows.

The building roof appears relatively new and likely has additional service life. However, a close up survey was not possible during the walk-through and additional survey work should be performed to verify the condition of the membrane and function of drainage systems. The perimeter detailing should be modified to ensure long-term watertightness. Appropriate termination and flashing details integrated with the adjacent masonry construction should be developed and installed.

Interior

The first floor interior is now used for retail purposes. The finishes installed in the 1921 renovation are largely intact, including hardwood and mosaic ceramic tile flooring, marble wainscot, stained and varnished wood trim, interior doors and hardware, plaster walls and ceiling, and plaster crown molding (Figure 15 and Figure 16).

The second floor interior has been adapted as a two-bedroom apartment. The kitchen and bathroom are several decades old. The two bedrooms and main living room have painted wood baseboard and window and door trim, hardwood floors, painted plaster walls, and several historic wall sconce light fixtures (Figure 17 and Figure 18). These finishes apparently date to the 1921 renovation of the building. Throughout the second floor, the plaster ceiling has been covered with rigid insulation and painted gypsum board. Second floor interior doors are newer flat panel wood veneer doors.

Potential Interior Repairs

Appropriate repairs to the interiors will depend upon the proposed use of the building. Most of the existing interior finishes are in good to fair condition, with many 1921-era finishes intact.

Figures

Figure 1. Overall view of the State Street facade.

Figure 2. Marbleized cast stone and brick masonry at the base of the State Street facade.

Figure 3. One cracked terra cotta window sill.

Figure 4. One unit with a hole and one spalled unit.

Figure 5. One displaced unit above the first floor storefront.

Figure 6. An aluminum mullion has been added at the center of the storefront at the first floor of the State Street facade.

Figure 7. The central second floor window is a non-original assembly consisting of painted 2x wood framing supporting four panes of glass and a separate, similarly divided storm window.

Figure 8. The wood windows are in fair condition, with some wood decay and displacement of window sash joinery.

Figure 9. The Fairchild Street facade.

Figure 10. Left: Individual brick units were observed to have erosion or spalling of the face.
Figure 11. Right: Cracks and spalls that have been previously filled with mortar were observed.

Figure 12. Localized areas of brick masonry appear to have been rebuilt previously.

Figure 13. Remnants of a previous coating on the masonry were observed.

Figure 14. The masonry party wall as viewed from the adjacent building appeared to be in fair condition.

Figure 15. Hardwood and mosaic ceramic tile flooring in the first floor retail space.

Figure 16. Plaster crown molding in the first floor retail space.

Figure 17. The second floor interior.

Figure 18. Circa 1921-era wall sconce light fixture at the second floor.

PIERCE ENGINEERS, Inc.
10 West Mifflin Street, Suite 205
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Walk thru Evaluation of 125 State Street
Madison, WI
Date of Walk thru 11/18 and 12/4/2011. Date of report 12/7/2011
PE Job #11272

EXECUTIVE SUMMARY

1. Description of Structural System
   a. Foundation Walls. Cut stones mortared
   b. Floor/Roof Construction. Wood joists on masonry bearing walls.
   c. No interior columns or bearing walls in the general structure. Infill framing at the first floor is supported by wood beams/columns in the basement.
   d. Walls shared with 127 State and 123 State.
2. Building Support
   a. The building is supported off the party walls and the exterior wall along Fairchild Street.
   b. The floors and roof are wood construction with joists bearing into the brick party walls.
3. Floor/ Roof Loading
   a. Existing Structure Capacity. First floor live load capacity 65 psf. Second Floor live load capacity 50 psf. Roof (snow) live load capacity is 30 psf un-drifted.
   b. Proposed use. Proposed use: First Floor-retail requiring 100 psf. Second floor- office requiring 65 psf. Roof (snow)- drift consideration-see d.
   c. Existing Use. First Floor-retail requiring 100 psf. Second Floor-apartments requiring 40 psf. Roof (snow) required 21 psf.
   d. Snow Loading on Roof: If an occupancy change occurs, the drift loading from the adjacent higher 123 State roof would need to be taken into consideration. The existing roof capacity is calculated at 11 % short of that required by the drift analysis should the occupancy change occur.

GENERAL COMMENTS

The building is two stories with a partial basement. The building fronts on State Street and is exposed on Fairchild Street. The first floor is retail and the second is apartments. The building is wood frame with masonry exterior walls. For the purpose of this report east/west is taken paralleling State Street.

BASEMENT

The basement exists only to the south end of the building. The north half is unexcavated and may be an inaccessible crawl space. The basement walls are cut limestone and appear to be in good condition.

FIRST FLOOR FRAMING

The floor is wood framed using 3x12 joists to span 18'. The joist span parallels State Street. A possible stair was filled in along the east side of the space. The columns /beams that frame this abandoned opening are in good condition. The wood joists frame to the header beam at the abandoned opening and are toe nailed for anchorage. The joint is loosening up and should be reinforced with modern day joist hangers. The calculated live load capacity is 65psf versus a present day code required capacity of 100 psf.

SECOND FLOOR FRAMING

The framing for the second floor is 1 ½"x 11 ½" wood joists at 16" oc spanning the full width of the building. The calculated live load capacity is 50 psf.

ROOF FRAMING

The roof is framed with 1 5/8" x 9 ½" wood joists @16" oc spanning the full width of the building. The live load (snow) capacity is 30 psf in the non drafted situation. The live load requirement due to snow if the occupancy were changed would require a drift consideration from the adjacent higher roof of 123 State. If this drift were to be taken into consideration, the existing construction of the roof would be inadequate by 11 %.
The roof surface is pitched to the south. Roofing is single ply and relatively new.

EXTERIOR WALLS

The State Street elevation is terra cotta over hollow clay tile. This wall is covered in a separate report. It is essentially non bearing for the floor and roof. The Fairchild Street wall is thru the wall brick and supports the floor and roof construction.

Written by: Robert B. Corey, PE

Photo 1 – State Street elevation

Photo 2 – State Street access to 2nd floor

Photo 3 – 2nd floor

Photo 4 – Stair to partial basement

Photo 5 – 1st floor joist framing

Photo 6 – 1st floor joist bearing at basement wall

Photo 7 – 2nd floor apartment

Photo 8 – 2nd floor apartment ceiling

Henneman Engineering Inc.
1232 Fourier Drive, Suite 101
Madison, WI 53717
608.833.7000

Walk Thru Evaluation of 125 State Street
Date of Survey: December 1, 2011 Date of Report: December 16, 2011

Existing Mechanical Conditions Narrative

Castle & Doyle Building 1856

Mechanical System

The heating system consists of a gas-fired atmospheric hot water boiler located in the basement. A gas-fired domestic water heater is next to the boiler. The retail space has an air conditioning unit but the apartments not air conditioned. There is a single gas meter and single water meter for this building, which serves only this building. The roof drains into a gutter along N. Fairchild St. and into an exterior downspout .

Sanitary sewer

Hot water boiler and water heater

The building does not have a fire protection system.

Mechanical Infrastructure

The storm water downspout discharges into a storm sewer receptor at the sidewalk. The gas, storm sewer and sanitary sewer utilities are from mains in N. Fairchild St. and the water service is from State St. They appear to serve only this building.

Condition Assessment

The boiler is estimated to be 10-15 years old and appears to be in good condition. The hot water piping in the basement is newer, possibly installed when the boiler was installed but could not see piping outside of the basement. None of the piping is insulated.

The water heater appears to be no more than 5 years old and is in good condition. Domestic hot water piping is copper (uninsulated) in the basement but it is unknown what the material is on the upper floors. Sanitary piping is a mix of PVC (newer) and cast iron (original). The kitchen and bathroom fixtures within the building are not historic. The second floor apartment fixtures appear to have been added when the second floor was adapted to an apartment.

Remarks

The existing HVAC systems in the retail space would not be acceptable under the current building code for business occupancy. While the boiler and water heater in the building are in good condition, it is unlikely that reuse would be practical or even possible due to capacity, condition, age, or code compliance.

Written by: Kevin Lichtfuss, P.E.

Potter Lawson
Success by Design
15 Ellis Potter Court
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Walk Thru Evaluation of 125 State Street
Date of Walk Thru: November 29, 2011 Date of Report: December 9, 2011
Potter Lawson Job No. 2010.23.00

Fire Engine House No. 2 / Castle & Doyle Building 1856/1921-22

Electrical System
The building electrical service is 400amps at 120/208V, 3-phase, from MG&E and enters the basement from North Fairchild Street. The electrical distribution equipment is located in the basement, and there are two electrical meters for the building. Electrical panels distribute the power to building loads. The telephone service is in the basement.

Electrical Infrastructure
This building appears to have an independent electrical power system that does not connect to adjacent buildings.

Condition Assessment
Electrical equipment age varies from the 1970's to 1990's. While one of the basement panels is from the 1990's (which powers the retail store on first floor), the second floor electrical panel is nearing the end of its useful life. There were no noted obvious failures of electrical equipment, such as evidenced by heat or smoke discoloration. The MG&E electrical service equipment appeared to be in good condition.

Light fixtures varied from incandescent fixtures (about 1960's) in the apartment to incandescent track lights (about 1980's) in the retail shop. Some light fixtures in the apartment were not functioning. In general the condition of the light fixtures in the apartment is poor. Wiring device condition and age varies also, ranging from 1960's to 1990's. Receptacle quantity and condition is poor in the apartment. Branch circuits ranged from flexible metal conduit to EMT conduit. Although the condition of the branch circuit wiring is not known, it appeared that the installation age ranged from the 1960's to the 1990's.

The current wiring device locations in the apartment do not comply with accessibility requirements. Receptacle quantity and locations in the apartment do not comply with current NEC requirements. The knife switch disconnect does not comply with current NEC requirements. Compliance with current codes for these items would require branch circuit and receptacle replacement.

The electrical equipment appeared to be accessible for maintenance and repair.

Building main disconnect.

Basement electrical meter and disconnect.

Knife switch and disconnect in 125 ½ State Street (2nd floor apartment).

Electrical panel 125 ½ State Street (2nd floor apartment).

Remarks

The electrical systems in this building would be removed in their entirety if the proposed single building design concept was implemented. The National Electrical Code and MG&E rules require that a single electrical service power a single building.

Written by: John Dreher, PE

ASBESTOS INSPECTION & BULK SAMPLING

125, 125 ½ State Street, Madison, Wisconsin

Advanced Health & Safety LLC (AHS) was contacted to conduct an asbestos survey at the aforementioned property.

Mr. Robert J. Stigsell of AHS inspected the properties on November 11, 2011. The property was inspected for the presence of asbestos containing building materials. Bulk samples were taken for building materials found suspect to contain asbestos, as discussed. All samples were shipped overnight via Fed Ex. and were submitted to Triangle Environmental Services for analysis by Polarized Light Microscopy (PLM).

Four separate categories of materials (if applicable) will be listed for the property:

The first list (List A) will be of materials found to contain asbestos, which are **friable** or may become friable during demolition. It is **required** that these materials be removed by a certified asbestos abatement contractor prior to a demolition. **All asbestos materials in List A must be removed prior to a fire training burn.**

The second list (List B) will contain materials found to contain asbestos but are described as **Category II non-friable.** If the building is to be demolished, it is **required** that these materials be removed by a certified asbestos abatement contractor prior to a demolition. **All asbestos materials in List B must be removed prior to a fire training burn.**

The third list (List C) will contain materials found to contain asbestos but are described as **Category I non-friable.** If the building is to be demolished, the materials may be able to remain in the building during demolition if proper steps are taken and they do not become friable. These proper steps include, but are not limited to: notifying the demolition contractor of the presence of asbestos, utilizing wet methods during demolition, notifying the landfill accepting the waste that not-friable Category I asbestos materials are present, and manifesting the waste. Also, if any of the building materials are to be recycled (ie, crushing concrete) than the asbestos must be removed from this building material. NESHAPS (DNR) does not regulate materials found at < 1% asbestos, however OSHA does still regulate materials that contain < 1% asbestos. If materials in List C are likely to be disturbed, the contractor shall ensure compliance with all appropriate OSHA regulations. **All asbestos materials in List C must be removed prior to a fire training burn.**

The fourth list (List D) will include materials that were sampled and found **not to contain** asbestos. **Removal is not required for these materials.**

If any suspect materials are found during demolition/burn that has not been sampled during this inspection, Advanced Health & Safety should be contacted to assess the situation. Inaccessible areas may exist inside walls.

Building/Dwelling:	**125, 125 ½ State Street, Madison, Wisconsin**
Building Type:	**Residential/Commercial**
Inspector:	**Mr. Robert (Bob) J. Stigsell**
Inspector Certification:	**AII-03628**
Certification Expires:	**May 25, 2012**
Inspection Date:	**November 11, 2011**
Inspector Signature:	

List A

Asbestos Containing Friable Materials

(Required to be Abated prior to Demolition or Burning)

Basement

TSI Fittings (Samples 34-36)

Air-O-Cell Pipe Insulation (Samples 37-39)- approx 140 lf

Second Floor

White Kitchen Sink Underspray (Samples 16-18)

Basement

Patching Material where flue goes into wall (Samples 40-42)

List B

Asbestos Containing Category II Non-Friable Materials

(Required to be Abated prior to Demolition or Burning)

Second Floor

Window Glazing-Front Double Hung (Samples 1-3)

Window Caulking-Front Double Hung (Samples 4-6)

List C

Asbestos Containing Category I Non-Friable Materials

(May Be Able To Remain In Building During Demo if Not Friable- Consult DNR)

(These Materials Must Be Abated Prior To Burning)

Second Floor

Black Roofing Mastic (Samples 31-33)

Exterior

Door Caulking (Samples 50-52)- two front doors

List D

Materials Found Not To Contain Asbestos At 1% Or Greater

(Both Tested or Known Not To Contain Asbestos)

(No Abatement Required)

Second Floor

Drywall (Samples 7-9)

Concrete Block Mortar (Samples 10-12)
Ceramic Tile Grout (Samples 13-15)
Window Glazing-Back Double Hung (Samples 19-21)
Ceramic Tile Adhesive (Samples 22-24)
Ceramic Tile Grout (Samples 25-27)
Drywall Mud (Samples 28-30)

Basement
Plaster from Basement (Samples 43-49)

Exterior
Window Caulking (Samples 53-55)